

NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

A COMMUNITY-BASED MODEL FOR CERVICAL CANCER PREVENTION IN OHANGWENA AND KAVANGO WEST REGIONS, NAMIBIA

by

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A dissertation submitted in fulfilment of the requirements for the degree of

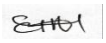
Doctor of Philosophy in Health Sciences at the Namibia University of Science and Technology.

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DECLARATION

I, Elizabeth Kaleinasho Ndakukamo, hereby declare that the work contained in the thesis entitled "A Community-Based Model for Cervical Cancer Prevention in Ohangwena and Kavango West regions in Namibia" is my original work and that I have not previously in its entirety or part submitted it at any university or other higher education institution for the award of a degree.

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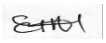
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DEDICATION

This dissertation is dedicated to the memory of my beloved late father, Mr Mikael Nghidengwa Ndakukamo, whose love, strength, and wisdom continue to guide me even in his absence. Though you are no longer here to witness this achievement, your spirit has remained my constant source of courage and inspiration. This work stands as a tribute to your life.

ABSTRACT

Background

Cervical cancer remains one of the leading causes of cancer related morbidity and mortality among women in Namibia, particularly in rural settings where access to preventive and screening services is limited. Despite national efforts through the Ministry of Health and Social Services to implement the Cervical Cancer Prevention and Control Policy in 2018, service uptake remains low due to social, behavioural, and systemic constraints. This study sought to develop a community-based prevention model for cervical cancer management that integrates community empowerment, health system responsiveness, as well as policy support to strengthen cervical cancer prevention in the Ohangwena and Kavango West regions of Namibia.

Methods

The study adopted an inductive theory-generating design. Moreover, it was implemented in three sequential phases, adopting a multi-method approach. Phase I entailed a quantitative cross-sectional survey that assessed community members' knowledge, attitudes, as well as practices regarding cervical cancer prevention. Phase II and III employed an exploratory design to explore women's health-seeking behaviour that influences the uptake of prevention services, moreover, to examine health system constraints in cervical cancer prevention. Furthermore, data was collected through structured questionnaires, focus group discussions and in-depth interviews, and analysed employing SPSS v29 and ATLAS.ti v23. Findings across the three phases were synthesised to generate key concepts, relationships, and propositions that informed the development of the community-based prevention model for cervical cancer management**.**

Results

The study revealed substantial gaps in knowledge and preventive practices of rural communities despite generally positive attitudes toward cervical cancer screening. More importantly, misconceptions, fear of positive results, as well as limited male involvement were prominent impediments to health-seeking behaviour. Furthermore, system-level constraints, including inadequate infrastructure, stock-outs of screening supplies, limited trained personnel, and weak referral systems, further impeded programme effectiveness. However, strong community leadership structures, peer support networks, as well as increasing awareness of women's health rights emerged as critical facilitators of change. The integration of these findings led to the conceptualisation of a six-component model grounded in policy and financing, research, decentralized governance, equitable and integrated care, capacity building, resilience, and supply chain management, all linked by facilitators such as people-centred care, community empowerment, partnership, and advocacy.

Conclusion:

This study concludes that achieving a cervical-cancer-free Namibia requires coordinated initiatives that merge community engagement with systemic reform. Moreover, while policy frameworks exist, their translation into context-specific and community-driven interventions remains limited. More importantly, the proposed community-based prevention model provides a practical and adaptable framework for guiding programme design, implementation, as well as evaluation of cervical cancer prevention initiatives in rural Namibia. It emphasises empowerment, inclusivity, and sustainability, offering policymakers and practitioners an avenue to enhance early detection, improve service utilisation, and ultimately reduce cervical cancer growth.

Keywords: Cervical cancer, prevention, model, Namibia, community, health system, women's health, rural health.

Table of Contents

DECLARATION i
RETENTION AND USE OF THESIS ii
ACKNOWLEDGEMENTS iii
DEDICATION iv
ABSTRACT v
LIST OF FIGURES viii
LIST OF TABLES ix
PUBLICATIONS INCLUDED IN THE THESIS x
DEFINITIONS OF TERMS xi
ACRONYMS AND ABBREVIATIONS xiv
CHAPTER 1: INTRODUCTION 1
1.1. Background 1
1.2. Problem statement 3
1.3. Rationale of the study 4
1.4. Research aim, objectives and questions 5
1.5. Scope of the study 5
1.6. Delimitations of the study 6
1.7. Structure of the thesis 6
1.8. Summary 7
CHAPTER 2: LITERATURE REVIEW AND THEORETICAL FRAMEWORK 8
2.1. Introduction 8
2.2. Philosophical basis of the study 8
2.3. Literature review 10
2.4. Knowledge, attitude and practices of cervical cancer prevention 19
2.5. Attitudes 21
2.6. Practice in cervical cancer prevention 23
2.7. Health-seeking behaviour and cervical cancer prevention 24
2.8. Health system challenges in cervical cancer prevention 30
2.9. Community-based interventions in cervical cancer prevention 35
2.10. Gaps in literature 37
2.11. Theoretical frameworks 38
2.12. Summary 42
CHAPTER 3: METHODOLOGY 44
3.1. Introduction 44
3.2. Research design 44
3.3. Study setting 45
3.4. Study population 48
3.5. Inclusion and exclusion criteria 49
3.6. Sampling method and sample size 50
3.7. Data collection methods 52
3.8. Study variables and measurement 56
3.9. Data analysis 58
3.10. Field notes 59
3.11. Measures to ensure reliability, validity, and trustworthiness 59
3.12. Phase IV: Model development 62
3.13. Merging of the study phases 64

3.14. Ethical clearance and permission to conduct research 65
3.15. Integrity and responsible use of Artificial Intelligence (AI) 66
3.17. Summary 67
CHAPTER 4: RESULTS 67
4.1. Introduction 67
4.2. Presentation of quantitative results [phase I] 67
4.3. Attitudes towards cervical cancer prevention 78
4.4. Practice of cervical cancer screening 82
4.5. Women's health-seeking behaviour (Phase II) 88
4.6. Health Systems constraints for cervical cancer prevention (Phase III) 100
4.7. Data triangulation 114
CHAPTER 5: DISCUSSION OF THE RESULTS 116
5.1. Introduction 116
5.2. Community knowledge, attitude and practice 116
5.3. Participants' healthcare-seeking behaviour for cervical cancer prevention 118
5.4. Health-System Challenges Affecting Cervical-Cancer Prevention 120
5.5. Summary 123
CHAPTER 6: MODEL DEVELOPMENT 124
6.1. Introduction 124
6.2. Purpose and rationale of the model 124
6.3. Theoretical and empirical foundation 124
6.4. Guidelines for operationalising the model 150
6.5. Summary 155
CHAPTER 7: CONCLUSION, UNIQUE CONTRIBUTIONS, STUDY LIMITATIONS AND RECOMMENDATIONS 156
7.1. Introduction 156
7.3. Unique contributions to the body of knowledge 157
7.4. Study limitations 158
7.5. Implication of the study findings 158
7.6. Recommendations 159
7.7. Summary 160
REFERENCE LIST 161
Appendices 174

LIST OF FIGURES

FIGURE 2.1: ANATOMICAL DEVELOPMENT OF CERVICAL CANCER 13
FIGURE 2.2: THE HEALTH BELIEF MODEL 39
FIGURE 2.3: THE SOCIOECOLOGICAL MODEL 41
FIGURE 2.4: WHO'S HEALTH SYSTEM FRAMEWORK 42
FIGURE 2.5: CONCEPTUAL FRAMEWORK OF THE STUDY 43
FIGURE 3.1: ADMINISTRATIVE MAP OF NAMIBIA 46
FIGURE 3.2: MAP OF THE OHANGWENA REGION 47
FIGURE 3.3: MAP OF THE KAVANGO WEST REGION 48
FIGURE 3.4: SCHEMATIC ILLUSTRATION OF THE STUDY'S METHODOLOGICAL PROCESS 63
FIGURE 4.1: AWARENESS OF CERVICAL CANCER, HPV, AND HPV VACCINE 69
FIGURE 4.2: SOURCE OF INFORMATION ABOUT CERVICAL CANCER 70
FIGURE 4.3: KNOWLEDGE OF CERVICAL CANCER RISK FACTORS. 71
FIGURE 4.4: KNOWLEDGE OF CERVICAL CANCER PREVENTION AND SCREENING METHODS 72
FIGURE 4.5: KNOWLEDGE OF THE SIGNS AND SYMPTOMS OF CERVICAL CANCER 73
FIGURE 4.6: AWARENESS OF WHETHER CERVICAL CANCER CAN BE PREVENTED 74
FIGURE 4.7: KNOWLEDGE OF HOW CERVICAL CANCER CAN BE PREVENTED 75
FIGURE 4.8: OVERALL, KNOWLEDGE LEVELS TOWARD CERVICAL CANCER PREVENTION 76
FIGURE 4.9: DISTRIBUTION OF WOMEN WHO HAVE BEEN SCREENED FOR CERVICAL CANCER 82
FIGURE 4.10: RESPONDENTS WHO REPORTED SUPPORTING A WOMAN TO UNDERGO SCREENING 83
FIGURE 4.11: DISTRIBUTION OF RESPONDENTS WHO HAVE RECEIVED HPV VACCINATION. 84
FIGURE 4.12: RESPONDENTS' INTENTION TO UNDERGO CERVICAL CANCER SCREENING 84
FIGURE 4.13: KNOWLEDGE, ATTITUDE, AND PRACTICE SCORES 87
FIGURE 4.14: DATA SOURCES AND THEIR CONTRIBUTIONS TO TRIANGULATION 115
FIGURE 6.1: COMMUNITY-BASED PREVENTION MODEL FOR CERVICAL CANCER MANAGEMENT. 138

LIST OF TABLES

TABLE 4.1: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS 67
TABLE 4.2: LOGISTIC REGRESSION MODEL FOR KNOWLEDGE ABOUT CERVICAL CANCER 76
TABLE 4.3: ATTITUDE ON CERVICAL CANCER PREVENTION AMONG RESPONDENTS. 78
TABLE 4.4: LOGISTIC REGRESSION MODEL FOR ATTITUDE TOWARDS CERVICAL CANCER 81
TABLE 4.5: LOGISTIC REGRESSION MODEL FOR PRACTICE TOWARDS CERVICAL CANCER 86
TABLE 4.6: TEST OF ASSOCIATIONS BETWEEN KNOWLEDGE, ATTITUDE AND PRACTICE 88
TABLE 4.7: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS 89
TABLE 4.8: OUTLINE OF THEMES AND SUB-THEMES 90
TABLE 4.9: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS 100
TABLE 4.10: OUTLINE OF THEMES, SUBTHEMES, AND KEY FINDINGS.....101
TABLE 6.1: DEFINITION OF CONCEPTS 126
TABLE 6.2: RELATIONSHIP STATEMENTS BETWEEN CONCEPTS.....128
TABLE 6.3: SUMMARY OF THE LEVELS AND KEY CONCEPTS OF THE MODEL 133
TABLE 6.4: VALIDATION CRITERIA 140
TABLE 6.5: DEMOGRAPHIC CHARACTERISTICS OF MODEL VALIDATION PARTICIPANTS 142
TABLE 6.6: AGREEMENT SCORES FOR MODEL VALIDATION 143
TABLE 6.7: OPERATIONAL FRAMEWORK BY MODEL LEVELS.....147
TABLE 6.8: STEPWISE IMPLEMENTATION APPROACH.....149

PUBLICATIONS INCLUDED IN THE THESIS

Journal Articles

1. **Ndakukamo, E. K**., Mahalie, R., & Hailonga, P. (2025). Cervical cancer prevention in rural Namibia: A cross-sectional analysis of community knowledge, attitudes, and practices in Ohangwena and Kavango West. International Journal of Sub-Saharan African Research, 3(2).

2. **Ndakukamo, E. K**., Mahalie, R., & Hailonga-van Dijk, P. (2025). Health system constraints in cervical cancer prevention in rural Namibia: A qualitative study. African Journal of Primary Health Care & Family Medicine, 17(1), a4976. https://doi.org/10.4102/phcfm.v17i1.4976

Manuscript Under Review

1. **Ndakukamo, E.K**., Mahalie, R. & Hailonga, P. (2025). Health-Seeking Behaviour of Rural Women for Cervical Cancer Prevention in Namibia: A Qualitative Study. (Under review)

DEFINITIONS OF TERMS

Attitude: An attitude represents a person's general feeling of favourableness or unfavourableness towards some stimulus object (Becker, 1974). Moreover, this research delineated the perceptions and sentiments regarding cervical cancer and its preventive strategies. It systematically examined the attitudes of both male and female participants, aged 20 to 65, towards cervical cancer prevention.

Behaviour: Behaviour refers to the actions or reactions of individuals in response to internal or external stimuli, shaped by biological, psychological, and social factors. Furthermore, in health research, behaviour such as health-seeking practices, screening uptake, as well as lifestyle choices are critical determinants of health outcomes (Becker, 1974).

Belief: Refers to the sensation of certainty regarding the existence of something or someone, or the truth of a particular concept (Becker, 1974). In this study, beliefs concerning the existence of cervical cancer and preventive strategies were explored. These beliefs, which refer to the sensation of certainty regarding the existence of something or someone, or the truth of a particular concept, were found to significantly influence the attitudes and actions of the participants. Importantly, the study included males and females aged 20 to 65, residing in chosen rural areas.

Cervical cancer prevention: As defined in this study, it refers to measures and strategies aimed at reducing the risk of developing cervical cancer. Moreover, these measures primarily include HPV vaccination for primary prevention, screening and treatment of precancerous lesions for secondary prevention, as well as treatment and palliative care for advanced disease for tertiary prevention (WHO African Region, 2024).

Challenge: A challenge is a difficulty or obstacle that impedes progress or achievement (WHO, 2017). In the context of this study, challenges are the structural, social, economic, or cultural barriers that limit the uptake of cervical cancer preventive services in rural Namibia.

Community: Defined as a social unit of varying sizes where members reside within a specified locality, moreover, share governance and collective values (Abramson & Abramson, 2008). Within the scope of this study, the community, which comprises both male and female individuals residing in the Ohangwena and Kavango West regions, aged between 20 and 65, played a crucial role.

Community-based: This concept refers to a collaborative approach that engages community members in decision-making (Abramson & Abramson, 2008). Moreover, within this study, the term 'community' refers to participants, healthcare providers, and policymakers who participated in assessing community needs related to cervical cancer prevention and discussed practical ways to promote its prevention and provide services.

Community-based model: A community-based model refers to an approach that designs and delivers health interventions in close partnership with community members and frontline providers. Furthermore, it focuses on adopting community strengths, local knowledge, and context-specific solutions to improve health outcomes. Community-based models underscore participation, ownership, and accessibility (Rifkin, 2021).

Culture: In this context, culture refers to the collective values, norms, and codes that jointly form a group's beliefs, attitudes, and behaviour through their interaction with and within their environments (Idang, 2018). For this study, Ovambo and Kavango values, norms, and codes that positively and negatively affect cervical cancer prevention were described.

Development: Refers to the systematic use of knowledge and understanding gained from research directed toward the production of valuable materials, devices, systems, or methods (Tracey, 2009). In this study, development refers to the construction of a model that illustrates how cervical cancer prevention can be promoted in the Ohangwena and Kavango West regions of Namibia.

Gender Norms, Masculinity, and Femininity: Gender norms refer to the social expectations regarding how men and women should behave. Masculinity and femininity, on the other hand, are culturally constructed roles and traits assigned to each gender (Morrow, 2020). Moreover, these norms often dictate decision-making power in reproductive health as well as influence whether women can access cervical cancer screening and treatment.

Healthcare-seeking behaviour: Refers to the actions taken by individuals when they perceive themselves to have a health problem, including decisions to seek care, choice of health provider, as well as timing of seeking care (Alexandra, 2020). For this study, healthcare-seeking behaviour refers to how males and females between 20 and 65 in the Ohangwena and Kavango West regions respond to symptoms, awareness, and preventive services related to cervical cancer.

Health systems: According to the World Health Organisation (WHO) (2010), a health system includes all the people, institutions, and resources whose main purpose is to improve health. In this study, the health system refers to the facilities, resources, and structures in Ohangwena and Kavango West that provide cervical cancer prevention, screening, and treatment services.

Health workers: These are individuals who provide preventive, curative, promotional, or rehabilitative healthcare services systematically to people (World Health Organisation (WHO), 2007). For this study, doctors, nurses, and community health officers working at health facilities in the Ohangwena and Kavango West regions were regarded as health workers.

Knowledge: This refers to awareness, facts, information, and understanding of something (Morrow, 2020). Moreover, this study measured the level of awareness, as well as the knowledge of facts and information, regarding cervical cancer and its preventive measures among males and females aged 18-65 in the Ohangwena and Kavango West regions.

Management: Management in this context focuses on strengthening prevention and early detection rather than clinical treatment of advanced disease. This aligns with public health definitions that describe cancer management as the organisation and implementation of services across the prevention, detection, and early care continuum (World Health Organisation, 2023).

Model: A model is the simplified representation of a concept, system or process that assists in explaining and predict the relationship between several complex perceptual phenomena (Morrow, 2020). In this study, a model refers to a diagrammatic representation of identified concepts related to cervical cancer prevention.

Prevention: In this study, prevention refers to actions aimed at reducing the risk of developing cervical cancer through HPV vaccination, screening, early treatment of precancerous lesions, and community education. Prevention focuses on mitigating the disease before it develops or detecting it early when treatment is most effective (World Health Organisation, 2020).

Policymakers: In the context of this study, policymakers refer to individuals who make decisions regarding patient management (Elit et al., 2020a). In this study, it refers to the Nurse Manager (matron), Primary Health Care (PHC) Supervisor, Senior Medical Officer (SMO) and Chief Medical Officer (CMO).

Practices: Practices are the habitual actions or behaviours of individuals or groups, often shaped by knowledge, attitudes, as well as cultural norms (Becker, 1974). For this study, practices refer to the preventive behaviour, such as cervical cancer screening, HPV vaccination, and lifestyle choices, adopted by males and females in the Ohangwena and Kavango West regions.

Rural: Rural refers to areas that are geographically located outside towns and cities, characterised by lower population density, limited infrastructure, as well as fewer health services (United Nations, 2018). In this study, rural areas refer to the communities in the Ohangwena and Kavango West regions, where distance, limited resources, as well as health system constraints impede access to cervical cancer prevention services.

Sexual and Reproductive Health (SRH) and Rights: Sexual and reproductive health refers to a state of physical, mental, and social well-being in all matters related to the reproductive system, encompassing not only the absence of disease however also the ability to make informed decisions about one's reproductive life. Moreover, Sexual and reproductive health rights (SRHR) encompass the right of all individuals to make decisions about their bodies, sexuality, and reproduction free from discrimination, coercion, and violence (World Health Organisation, 2023a).

Socio-Cultural Norms and Values: Socio-cultural norms and values are not just shared expectations and beliefs within a community, however they are also influential factors that shape how individuals perceive illness, health-seeking behaviours, and prevention strategies. Their impact is significant in health research (Idang, 2018).

ACRONYMS AND ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Care
ATLAS.ti	Archive of Technology, Life world and Language. Text Interpretation
CAN	Cancer Association of Namibia
CBPM	Community-Based Prevention Model
CC	Cervical Cancer
CHW	Community Health Worker
CI	Confidence Interval
COREQ	Consolidated Criteria for Reporting Qualitative Research
DHIS	District Health Information System
DNA	Deoxyribonucleic Acid,
EMHB	Ecological Model for Health Behaviour
FGD	Focus Group Discussion
HBM	Health Belief Model
HCW	Health Care Worker
HPV	Human Papilloma Virus
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
HSS	Health System Strengthening
IDI	In-Depth Interview
IEC	Information, Education and Communication
IRPC	Institutional Research and Publications Committee
KAP	Knowledge, Attitude and Practices
KI	Key Informant
LEEP	Loop Electrosurgical Excision Procedure
LMICs	Low- and Middle-Income Countries
MoHSS	Ministry of Health and Social Services
NDHS	Namibia Demographic and Health Survey
NGO	Non-Governmental Organisation
NUST	Namibia University of Science and Technology
PHC	Primary Health Care
SD	Standard Deviation
SDG	Sustainable Development Goal
SPSS	Statistical Package for the Social Sciences (Version 29)
SRH	Sexual and Reproductive Health
STROBE	Strengthening the Reporting of Observational Studies in Epidemiology
UNFPA	United Nations Population Fund
UHC	Universal Heal Coverage
VIA	Visual Inspection with Acetic Acid
VILI	Visual Inspection with Lugol's Iodine
WHO	World Health Organisation
WHSF	WHO Health Systems Framework
WHO-AFRO	World Health Organisation – Africa Regional

CHAPTER 1: INTRODUCTION

1.1. Background

As a point of departure, it is imperative to note that cervical cancer is one of the most preventable causes of death among women, yet globally, a woman still dies from it every two minutes (Singh et al., 2023). Prevention initiatives such as HPV vaccination, screening, and treatment of precancerous lesions are well established and highly effective (WHO African Region, 2024). Moreover, countries that have invested in organised screening systems, including the Nordic states, have reduced incidence and mortality by up to 80%, demonstrating what is possible when prevention is prioritised (Elit et al., 2020b). However, most low- and middle-income countries (LMICs) continue to encounter high incidence and mortality because of limited infrastructure, poor awareness, as well as restricted access to services. Persistent infection with high-risk HPV types causes more than 95% of cervical cancer cases (WHO African Region, 2024a), however disease progression is strongly influenced by broader social factors such as poverty, gender inequality, and health system weaknesses. Understanding how these factors interact is central to explaining why a preventable disease continues to cause significant loss of life.

Globally, cervical cancer is the fourth most common cancer among women, with an estimated 660,000 new cases and 350,000 deaths reported in 2022 (Bray et al., 2024a). About 90% of these deaths occur in LMICs, with the highest concentration in Sub-Saharan Africa (SSA). More importantly, the region records some of the world's highest age-standardised incidence and mortality rates, and numerous countries diagnose most women at advanced stages because screening coverage remains low and treatment services are inconsistent (WHO African Region, 2024c; Mutyaba et al., 2019). Countries such as Malawi, Zambia, and Eswatini report incidence and mortality rates that exceed 60 cases and deaths per 100,000 women (Bray et al., 2024b). Countries in West and East Africa, including Nigeria, Kenya, and Uganda, continue to encounter substantial mortality as well (IARC, 2021; Bray et al., 2021). These patterns reflect deep inequalities in access to prevention, early detection, and timely treatment.

To counter these inequities, the World Health Organisation (WHO) launched the Global Strategy for the Elimination of Cervical Cancer in 2020, centered on the 90-70-90 targets: vaccinating 90% of girls by age 15, screening 70% of women at 35 and 45 years, and treating 90% of identified lesions (WHO, 2020). Importantly, meeting these targets could prevent more than 62 million deaths this century. While high-income countries have made significant progress, most African countries remain far below these thresholds due to limited financing, dependence on donor-supported vaccination, low screening coverage, as well as structural constraints in their health systems (Adams & Botha, 2024; Aviv, 2022).

Furthermore, Namibia reflects these regional challenges. As of 2023, the country records approximately 375 new cases and 214 deaths annually (Bray et al., 2024a). Its age-standardised incidence rate of 37.4 per 100,000 women and mortality rate of 22.5 per 100,000 remain far above global averages (Sung et al., 2021). Moreover, survival is also poor, with only 45-55% of women living five years after diagnosis because many present late (MacBride, 2023). Namibia's high HIV prevalence further increases risk, as women living with HIV are up to six times more likely to develop cervical cancer (MoHSS, 2022; Vigneshwaran et al., 2023).

In response, the Ministry of Health and Social Services (MoHSS) has expanded national prevention initiatives. A nationwide HPV vaccination campaign was launched in 2025, targeting girls aged 9–14 years (MoHSS, 2025a). Routine Visual Inspection with Acetic Acid (VIA) and Pap smear services have also been strengthened, supported by the National Cancer Control Plan (2023–2030). Moreover, the Cancer Association of Namibia complements these initiatives through awareness campaigns, community-based screening, as well as support to the National Cancer Registry. Together, these initiatives demonstrate a growing national commitment to preventing cervical cancer.

Despite these advances, major gaps persist in rural regions such as Ohangwena and Kavango West. More than 70% of residents live in remote areas with limited transport, long travel distances, and poor primary healthcare infrastructure (NSA, 2023; MoHSS, 2022). Many clinics experience shortages of trained staff, inconsistent screening supplies, as well as insufficient outreach activities (WHO, 2023). Equally important, socio-cultural norms, gender dynamics, limited health literacy, as well as low awareness of HPV further shape women's health-seeking behaviour (Bray et al., 2024a; Adams & Botha, 2024). These realities contribute to low screening uptake, delayed diagnosis, as well as continued vulnerability among rural women.

Evidence from Namibia and other LMICs supports this pattern. Studies from India, Nigeria, and Uganda indicate that knowledge and positive attitudes do not necessarily translate into screening, as women often encounter fear, stigma, cost barriers, and limited autonomy (Chawla et al., 2021; Obol et al., 2020a; Okedo-Alex et al., 2020). In Namibia, Pap smear uptake is reported to be below 15%, with rural women disproportionately affected by distance, cultural expectations, as well as reliance on traditional healers (Anyolo et al., 2024). Qualitative studies indicate that prevention efforts often feel externally imposed and not well aligned with community realities (Ndakukamo et al., 2025; Siseho et al., 2022).

Furthermore, although national policies, vaccination, and screening initiatives exist, a clear gap remains between the intended reach of these interventions as well as the everyday experiences of women in rural communities. Current evidence in Namibia does not adequately explore how individual knowledge, socio-cultural influences, and health-system challenges interact to shape cervical cancer prevention. Importantly, this gap is particularly visible in Ohangwena and Kavango West, where geographic isolation and historical resource constraints create distinct impediments. No prior Namibian study has combined these three dimensions into a unified, context-specific framework to guide prevention in rural settings.

Hence, this study responds to this gap by developing a community-based cervical cancer prevention model tailored to the rural contexts of Ohangwena and Kavango West. Equally important, the model integrates evidence from community knowledge, women's health-seeking behaviour, and health-system impediments to propose practical strategies for improving prevention services. The aim is to produce a context-appropriate framework that strengthens national efforts toward the WHO 90-70-90 elimination targets and supports more equitable cervical cancer prevention across Namibia.

1.2. Problem statement

Cervical cancer remains one of Namibia's leading causes of cancer deaths among women, yet preventive services are not adequately reaching large segments of the population. National screening coverage is estimated to be below 15-20%, which is significantly lower than the WHO target of 70% (MoHSS, 2025). As a result, over 60% of Namibian women are diagnosed at advanced stages, when treatment options are limited, and survival rates fall below 50% (MoHSS, 2025b). Furthermore, HPV vaccination coverage remains in early rollout phases, with national uptake not yet reaching 50% among eligible girls (MoHSS, 2025a). These gaps indicate that current prevention strategies are not achieving sufficient coverage to substantially reduce incidence and mortality.

In addition, rural regions encounter the greatest barriers. Ohangwena and Kavango West, together, host more than 410,000 residents, with over 70% living in remote settlements that lack reliable transportation and are far from health facilities (NSA, 2023). According to Universal Health Coverage estimates, 76% of Namibians live more than 10 km away from a health facility, and in some parts of Kavango West, this distance exceeds 20 km. These geographic barriers are compounded by persistent shortages of skilled staff, limited screening equipment, irregular outreach services, and weak referral pathways, as consistently reported in national facility audits (MoHSS, 2022; WHO, 2023). As a result, VIA and Pap smear services are inconsistent, with many clinics offering screening only a few days per month, if at all.

Furthermore, sociocultural barriers further reduce uptake. Studies in Namibia indicate that less than 30% of women have accurate knowledge of HPV, and fear, stigma, and misconceptions affect more than 40% of non-attenders (Anyolo et al., 2024). In addition, limited male involvement, beliefs about infertility, and reliance on traditional healers continue to influence women's health-seeking behaviour. These impediments directly contribute to Namibia's high cervical cancer rate, which includes an estimated 375 new cases and 214 deaths each year, as well as incidence and mortality rates that remain more than twice the global averages (Bray et al., 2024).

Although these challenges are recognised, evidence remains fragmented. Moreover, National reports document screening numbers, while small-scale studies explore social perceptions, and health system assessments indicate staffing shortages. However, no study has examined how knowledge, attitudes, practices, health-seeking behaviors, and health-system barriers interact to shape prevention in rural Namibia. Likewise, no context-specific prevention model exists to guide structured, community-based action.

To address this fragmentation, the present study adopts an integrated multi-method approach combining quantitative assessment of knowledge, attitudes, and practices with qualitative exploration of healthcare-seeking behaviour and system-level analysis. This design enables a comprehensive understanding of how individual, sociocultural, and structural determinants interact, providing an empirical foundation for the development of a community-based prevention model.

The central challenge is that cervical cancer prevention in rural Namibia is constrained by low screening coverage, inconsistent HPV vaccination uptake, deep-rooted sociocultural impediments, as well as persistent health system limitations. Moreover, there is no integrated, context-appropriate model to

guide comprehensive community-based prevention efforts. This study addresses this gap by generating the evidence required to develop such a model for the Ohangwena and Kavango West regions.

1.3. Rationale of the study

Notably, cervical cancer remains a preventable yet persistent public-health challenge in Namibia, particularly in rural regions where access to screening, HPV vaccination, as well as early treatment is limited. Despite national policies, recent HPV vaccination rollouts, and periodic screening campaigns, numerous women still lack accurate knowledge of the disease, experience socio-cultural impediments to seeking care, and depend on health facilities that are understaffed and inconsistently equipped. Furthermore, existing research in Namibia and similar lower-middle-income countries reveals moderate awareness however very low screening uptake, indicating a disconnect between national prevention efforts and women's lived realities. Current evidence provides little insight into how community knowledge, cultural expectations, and health system constraints interact to influence cervical cancer prevention in rural areas.

Conceptually, this study is informed by the Health Belief Model (HBM), Socio-Ecological Model (SEM), and the WHO health systems framework, which recognise that health behaviour is shaped by interacting determinants. These perspectives allowed the study to move beyond isolated behavioural explanations and instead examines how knowledge, social norms, service delivery capacity, and governance structures collectively influence prevention outcomes. This conceptual anchoring provides a structured foundation for the development of a multi-level community-based prevention model.

Moreover, these gaps underscore the need for a comprehensive understanding that integrates individual, community, and system-level factors to inform more effective prevention strategies. More importantly, limited research has examined the specific impediments encountered by rural women in regions such as Ohangwena and Kavango West. Ohangwena and Kavango West were selected due to their predominantly rural composition, documented service-delivery constraints, and geographic dispersion, which pose significant access challenges. These regions reflect operational realities common in several northern and north-eastern districts of Namibia, including long travel distances to facilities, limited specialist services, and reliance on outreach programmes. Studying these regions therefore provides insight into prevention challenges in high-need rural contexts, while offering lessons that may be transferable to other underserved districts with similar structural characteristics.

It is imperative to note that no existing study has developed a context-appropriate prevention model grounded in local realities in Namibia. Context-appropriate refers to a model that integrates sociocultural beliefs, gender dynamics, service-delivery capacity, workforce distribution, governance structures, and financing within rural Namibia. Unlike conventional prevention models that are often adapted from high-income settings or applied in a generic manner. Addressing this gap is essential for Namibia to develop interventions that are culturally relevant, operationally feasible and aligned with national and global cervical cancer elimination objectives. This study, therefore, aims to generate evidence that can inform practical improvements in policy and service delivery, while strengthening prevention efforts for underserved rural populations.

1.4. Research aim, objectives and questions

1.4.1. Research aim

The study aims to develop a community-based model to improve cervical cancer prevention among rural women in Ohangwena and Kavango West regions in Namibia.

1.4.2. Research objectives

The study aim:

1. To assess community knowledge, attitudes, and practices related to cervical cancer prevention in Ohangwena and Kavango West.
2. To explore women's health-seeking behaviour and socio-cultural factors influencing cervical cancer prevention in Ohangwena and Kavango West.
3. To examine health-system challenges affecting the delivery and uptake of cervical cancer prevention services in Ohangwena and Kavango West.
4. To integrate findings from the community, behavioural, and health-system levels to inform the development of a community-based cervical cancer prevention model.

1.4.3. Research questions

1.4.3.1 Primary research question

What community-based model can be developed to improve prevention outcomes in the regions of Ohangwena and Kavango West?

1.4.3.2 Secondary research questions

1. What knowledge, attitudes, and practices do community members in Ohangwena and Kavango West have regarding cervical cancer prevention?
2. How do women's health-seeking behaviour and socio-cultural factors influence cervical cancer prevention in these two regions?
3. What health-system challenges affect the delivery and uptake of cervical cancer prevention services in Ohangwena and Kavango West?
4. How can evidence from community-level, behavioural, and health-system analyses be integrated to inform the development of a community-based cervical cancer prevention model?

1.5. Scope of the study

This study focuses on two rural regions in Namibia, Ohangwena and Kavango West, as they encounter some of the most significant challenges in accessing cervical cancer prevention services. Moreover, the population of the study reflects the four objectives. Community members, both women and men of reproductive age, were included to assess their knowledge, attitudes, and practices. Women were particularly involved to explore their health-seeking behaviour as well as the social and cultural factors that influence their decisions. Furthermore, health workers were included to help identify health-system

challenges that affect service delivery. The study themes, therefore, cover community knowledge and practices, socio-cultural influences, and system-level barriers such as staff shortages and limited services. More importantly, the study also produced a community-based cervical cancer prevention model and included a validation exercise with experts to assess its clarity, simplicity, generality, relevance, and usefulness. The implementation of the model in real-world settings was not part of this study; however, the researcher intends to pilot and implement the model during a postdoctoral programme.

1.6. Delimitations of the study

This study focused specifically on rural communities in Ohangwena and Kavango West, two regions selected because they represent settings with limited access to cervical cancer prevention services. Moreover, the study population was delimited to adult community members, women of reproductive age, and healthcare providers involved in prevention activities. The quantitative phase assessed knowledge, attitudes, and practices among community members, while the qualitative phases explored women's health-seeking behaviour as well as the challenges encountered within the health system. The study examined cervical cancer prevention rather than diagnosis or treatment and therefore did not include clinical management of the disease. Additionally, the model developed is tailored to rural Namibian contexts and may not be fully applicable to urban settings or regions with different health system structures. These boundaries were intentionally set to ensure depth, contextual relevance, and feasibility within the scope of the study.

1.7. Structure of the thesis

This thesis is organised into eight chapters.

Chapter 1 introduces the study by presenting the background, problem statement, aim, objectives, research questions, rationale, scope and delimitation. Moreover, it sets the foundation for understanding why the study was conducted.

Chapter 2 reviews existing literature on cervical cancer prevention at global, regional, and local levels. Furthermore, it examines knowledge, attitudes, and practices, as well as socio-cultural influences, women's health-seeking behaviour, and health-system impediments. The chapter underscores the gaps that justify the development of a community-based prevention model.

Chapter 3 outlines the research methodology. In addition, it explains the mixed-methods design, philosophical stance, study setting, sampling procedures, data collection methods, data analysis techniques, as well as ethical considerations for all phases of the study.

Chapter 4 presents the results of the study. Quantitative and qualitative findings are organised according to the research objectives.

Chapter 5 discusses the findings in relation to existing literature. It explains how the results contribute to public health practice, cervical cancer prevention, as well as the strengthening of health systems in rural Namibia.

Chapter 6 synthesises findings from Phases I, II, and III and describes the development and validation of the community-based cervical cancer prevention model. Moreover, the chapter explains the theoretical frameworks underpinning the model.

Chapter 7 presents the study's conclusions, unique contribution to the body of knowledge as well as discussing its limitations. It also outlines the implications of the findings for policy, practice, and future programming. Moreover, it provides recommendations informed by the evidence generated in the study.

1.8. Summary

This chapter introduced the study by outlining the global, regional, and national impact of cervical cancer and explaining why prevention remains a major public health priority. Moreover, it described the Namibian context, underscoring the challenges encountered in rural regions such as Ohangwena and Kavango West, where limited access to services, socio-cultural influences, as well as health-system weaknesses contribute to low screening uptake and delayed care. More importantly, the chapter also presented the study's aim, objectives, research questions, rationale, significance, delimitations, scope, and limitations, demonstrating the need for a model that integrates community, behavioural, and system-level factors. By establishing the problem, identifying the gaps in existing evidence, and outlining the purpose and direction of the research, this chapter sets the foundation for the literature review that follows.

CHAPTER 2: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1. Introduction

The purpose of this literature review is to critically examine existing studies on cervical cancer prevention, focusing on the knowledge, attitude and practices (KAP) of cervical cancer prevention, health-seeking behaviors of cervical cancer prevention, as well as health system challenges, the three thematic areas that underpin this study. Moreover, by synthesising global, regional, and national evidence, this chapter establishes both the academic and practical foundations for the current research. In doing so, it underscores gaps in the literature concerning rural contexts, gender dynamics, and health system functionality in Namibia, thereby justifying the study's contribution to knowledge and policy.

2.2. Philosophical basis of the study

This study is grounded in the pragmatic philosophical worldview, which guides both the research process and its understanding. Pragmatism originates from the Greek word "pragma," meaning action. Furthermore, it postulates that truth and meaning are found in practical consequences and real-world experiences (Kaushik & Walsh, 2019). Pragmatism rejects rigid divisions between objectivity and subjectivity, instead focusing on employing the most effective methods for addressing real-world challenges (Creswell & Creswell, 2023). In the context of this study, pragmatism provides a flexible foundation for integrating both quantitative and qualitative methods to address a fundamental social and public health problem, cervical cancer in rural Namibia. More importantly, the study recognises that community members, women, and health workers each hold unique experiences, beliefs, and understandings that contribute to the broader reality of cervical cancer prevention. Therefore, the pragmatic stance enables the researcher to draw on both measurable evidence (from the KAP survey) and subjective experiences (from interviews and focus groups) to build a comprehensive understanding of barriers and facilitators to prevention.

According to Long, McDermott and Meadows (2018), pragmatism focuses on solving real-world challenges through inquiry. Similarly, this study seeks to develop a community-based prevention model that can be applied in practice to strengthen the delivery of cervical cancer prevention services in Namibia. Moreover, pragmatism correlates well with this purpose, as it enables the research to remain action-oriented, problem-driven, and context-sensitive, focusing on outcomes that are meaningful to the communities and health systems involved. By adopting this philosophical perspective, the study acknowledges that no single method or perspective can comprehensively capture the complexity of cervical cancer prevention. Instead, it is through the combination of different perspectives, scientific evidence, social understanding, as well as lived experience that a meaningful and practical model can emerge.

2.2.1 Paradigmatic assumptions

The study follows the following paradigmatic assumptions:

2.2.1.1. Ontology

Ontology refers to the researcher's perception of reality and how it exists (Scotland, 2012). Moreover, pragmatism supports a pluralistic and dynamic view of reality, suggesting that there is not just one fixed truth, however multiple realities depend on context and experience (Creswell & Creswell, 2023). In this study, the researcher recognises that perceptions of cervical cancer prevention differ among women, men, community leaders, and healthcare providers. These diverse realities are shaped by cultural beliefs, health literacy, access to care, and past experiences with the health system.

Thus, the study assumes a relativist or nominalist ontological stance, meaning that reality is perceived as socially constructed and context dependent. For example, a woman in a rural village may perceive screening as unnecessary or shameful due to cultural norms, while a nurse may view it as a public health necessity. Both views represent valid realities that influence behaviour and service delivery. Hence, understanding these multiple realities is imperative for developing an intervention that is appropriate for Namibia's social and health system context.

2.2.1.2. Epistemology

Epistemology refers to the process by which knowledge about reality is created and understood (Creswell & Creswell, 2023). From a pragmatic epistemological perspective, knowledge is built through both experience and action. Furthermore, this means that understanding cervical cancer prevention involves learning from what people know, believe, and do in their daily lives, as well as what can be measured through data and observation. In this study, two epistemological traditions are blended: positivism and constructivism within the pragmatic framework.

a) Positivism

Positivism assumes that knowledge can be gained through objective observation and measurement (Bergmann, 2024). Moreover, this approach guided the quantitative phase (Phase I), which examined the knowledge, attitudes, and practices (KAP) of community members in Ohangwena and Kavango West. Employing surveys, the study quantified awareness levels, attitudes towards screening, and reported practices. Furthermore, statistical analyses (e.g., correlations, regressions) enabled establish measurable relationships between demographic variables and preventive behaviors, producing generalisable findings.

b) Constructivism

Constructivism, on the other hand, assumes that knowledge is co-created through human interactions and subjective interpretation (Creswell & Creswell, 2023). Moreover, this approach guided Phases II and III, where focus group discussions and in-depth interviews explored the deeper meanings and experiences of women and healthcare workers. Through dialogue and narrative analysis, the study uncovered how culture, beliefs, and health system structures shape cervical cancer prevention. More importantly, this understanding complements the qualitative data by revealing the "why" behind observed patterns. Collectively, these two epistemological positions align with the pragmatic view that no single method is

superior; instead, each contributes unique insights to solving the problem. The integration of both enables a holistic understanding, capturing measurable trends while appreciating human experiences.

2.2.1.2 Axiology

Axiology concerns the role of values and ethics in the research process (Creswell & Creswell, 2023). Moreover, this study is deeply rooted in humanistic and ethical values such as respect, empowerment, and justice. Recognising the sensitivity of cervical cancer and its link to gender, stigma, and cultural norms, the researcher maintained strong ethical standards throughout the study, ensuring voluntary participation, informed consent, and confidentiality. Additionally, the study underscores the importance of health equity, with a particular focus on reducing disparities between urban and rural populations. Furthermore, it values community voices and local knowledge as pivotal to effective and sustainable health interventions. The study also embodies the principle of social responsibility, seeking to transform research findings into practical strategies that strengthen Namibia's health system and empower communities. By valuing both scientific evidence and lived experience, the study reflects a balance between professional integrity and empathy. The final model is therefore not only evidence-based however also ethically grounded, culturally sensitive, as well as responsive to the needs of those most affected by cervical cancer.

2.3. Literature review

2.3.1. Search strategy and selection process

The relevant literature was identified adopting a rigorous search strategy across major academic databases, including PubMed, Scopus, Google Scholar, ScienceDirect, Web of Science, CINAHL, HINARI, and EBSCOhost. Moreover, additional sources were identified through manual searches of the reference lists of key papers and consultation of resources available at the Namibia University of Science and Technology (NUST) library. Grey literature, such as reports and policy documents from the World Health Organisation (WHO) and the Ministry of Health and Social Services (MoHSS), was also reviewed to capture additional evidence relevant to the topic. The search strategy employed combinations of specific keywords and Boolean operators, including "Cervical cancer" AND "screening" AND "LMICs"; "HPV vaccination" AND "uptake" AND "Africa"; "Cervical cancer" AND "knowledge, attitude, and practices" AND "Namibia"; "Health-seeking behaviour" AND "women" AND "cervical cancer"; "Community-based interventions" AND "cancer prevention" AND "Africa"; and "Health system barriers" AND "cervical cancer prevention."

More importantly, the screening process was conducted in two phases. The first phase involved screening titles and abstracts to eliminate irrelevant articles, while the second phase entailed a full-text review to exclude studies that did not meet the inclusion and exclusion criteria. The initial screening was performed by the primary reviewer (EN), and a second reviewer independently verified the selected studies to ensure consistency and reduce bias. Furthermore, data extracted from eligible studies were organised adopting a synthesis matrix and analysed through a narrative synthesis approach based on the framework by Collaço et al. (2021). This method facilitated the integration of findings from studies employing diverse methodologies. Thematic analysis was then applied to identify and categorise emerging themes across four key domains: community knowledge, attitudes, and practices (KAP); socio-cultural and behavioural

influences; health system constraints; as well as community-based cervical cancer prevention models. These themes informed the empirical phases of the study and laid the foundation for developing a context-specific, community-based prevention model for cervical cancer in rural Namibia.

To ensure relevance, inclusion and exclusion criteria were established in alignment with the study's objectives and theoretical frameworks. Furthermore, studies were included if they focused on women of reproductive age, men as partners or community influencers, healthcare providers, policymakers, or community leaders relevant to cervical cancer prevention. Eligible studies originated from low- and middle-income countries (LMICs), particularly in Sub-Saharan Africa, although global studies offering transferable insights were also considered. The review targeted literature addressing knowledge, attitudes, and practices (KAP), health-seeking behaviour, socio-cultural and health system impediments, or community-based interventions and models. Preference was given to studies grounded in behavioural or health system theories, such as the Ecological Model of Health Behaviour, the Health Belief Model, as well as the Theory of Planned Behaviour. Peer-reviewed empirical studies, systematic and narrative reviews, and relevant grey literature published between 2015 and 2025 in English were included.

Studies were excluded if they focused solely on biological, molecular, or treatment outcomes; originated from high-income contexts with limited transferability; were opinion pieces, commentaries, or editorials without empirical data; lacked full-text availability; or were published in languages other than English. Moreover, the included studies were synthesised thematically, and the emerging findings were mapped onto the levels of the Ecological Model of Health Behaviour to illustrate the multiple layers influencing cervical cancer prevention. Two contextual background themes were identified: an overview of cervical cancer as a public health concern and the pathophysiology of the disease. The remaining themes corresponded with the study's research questions and guiding theoretical frameworks.

2.3.2. What is cervical cancer?

According to the WHO, cervical cancer is a type of cancer that starts in the cervix, which is the lower, narrow part of the womb that connects to the vagina, as illustrated in Figure 2.1 below (WHO African Region, 2024b). Furthermore, the disease develops when normal cells in the cervix change and start growing in an uncontrolled way, forming a lump called a tumour. If this tumour is not detected and treated early, the cancer cells can spread deeper into the cervix and eventually to other parts of the body (Freire et al., 2014). The leading cause of cervical cancer is a long-lasting infection with certain types of a prevalent virus called the human papillomavirus (HPV). HPV is spread through sexual contact. There are more than 200 types of HPV, however only a limited number are considered "high-risk." Two of them, HPV-16 and HPV-18, cause about 70% of cervical cancer cases worldwide (Malagón et al., 2024; WHO, 2016b). In most women, HPV infections typically resolve naturally within one to two years (WHO, 2016c). However, if the infection persists in the body for many years, it can interfere with the growth of cells in the cervix, increasing the likelihood of cancer development (Shapiro, 2022). Furthermore, cervical cancer usually develops slowly over a long time, often 10 to 20 years. This means there are many chances to prevent or stop it. The infection typically begins in the transformation zone of the cervix, an area where two distinct cell types meet and are more susceptible to change (WHO, 2022). If the virus stays in the cervix, it can cause abnormal cell changes known as cervical intraepithelial neoplasia (CIN). CIN is grouped into mild

(CIN1), moderate (CIN2), and severe (CIN3). CIN1 often disappears by itself, however CIN2 and CIN3 are considered dangerous “precancer” stages that can turn into cervical cancer if not treated (IARC, 2023).

There are two main types of cervical cancer. The most common type is squamous cell carcinoma, which develops from the flat cells covering the outer surface of the cervix and accounts for approximately 70-80% of all cases. The second type is adenocarcinoma, which develops from the gland cells inside the cervical canal and accounts for about 10-20% of cases (WHO, 2015). Although HPV-16 and HPV-18 are the leading causes worldwide, the exact types of HPV that cause cervical cancer can vary from one region to another. In Sub-Saharan Africa, including Namibia, another type called HPV-45 is also common alongside HPV-16 and HPV-18 (Harlfinger et al., 2023). Having HPV is necessary for cervical cancer to develop; however, it is not sufficient on its own. Other factors render the risk higher. These include being infected with HIV, smoking, having many children, using oral contraceptives for a long time, starting sex at an early age, having many sexual partners, and other infections like Chlamydia trachomatis, which also increase the risk (Murillo et al., 2016; Bray et al., 2024).

Notably, much of the scientific research on cervical cancer has been conducted in developed countries, however there are fewer studies from Sub-Saharan Africa, where the problem is worse. Moreover, this renders it challenging to comprehensively understand how HPV types and other risk factors behave in African countries like Namibia, particularly since HIV is more common and healthcare services have access limitations. Importantly, more studies are needed in this region so that policies and prevention programmes are based on local evidence rather than relying only on global data. Because cervical cancer takes many years to develop and goes through visible “warning stages,” it is one of the most preventable cancers. Vaccination against HPV can prevent the infection from ever starting. Furthermore, screening tests such as Pap smear or HPV DNA test can find early cell changes, and simple treatments can prevent these changes from turning into cancer. Prevention also means addressing other risk factors, such as controlling HIV, discouraging smoking, and improving reproductive health. Together, these steps form the backbone of the World Health Organisation’s global strategy to eliminate cervical cancer as a public health problem (WHO, 2020; Shapiro, 2022; Ozturk et al., 2024).

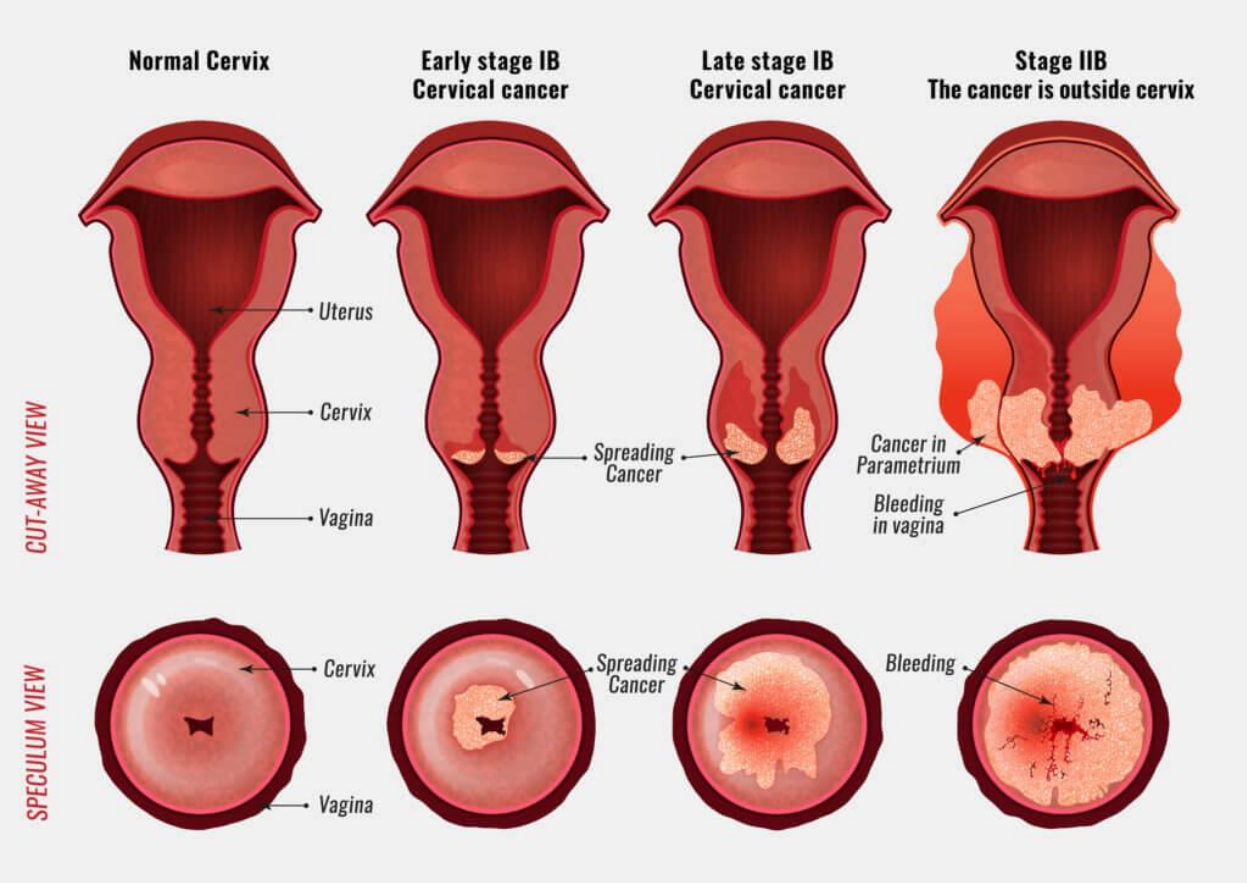


Figure 2.1: Anatomical development of cervical cancer.

Adapted from World Cancer Report 2014 (International Agency for Research on Cancer, 2014).

Moreover, cervical cancer is often described as a "silent disease" because early stages are usually asymptomatic or associated with mild signs that women may easily overlook (Omar et al., 2024). Moreover, the literature identifies abnormal vaginal bleeding, particularly post-coital bleeding, intermenstrual bleeding, as well as postmenopausal bleeding, as the most common early symptom (Asangbeh-Kerman et al., 2022; Caruso et al., 2024; Harlfinger et al., 2023a). Other early signs include unusual vaginal discharge, which may be watery or malodorous, and pelvic discomfort or pain during sexual intercourse (WHO, 2015). In advanced stages, patients frequently present with persistent pelvic and back pain, urinary obstruction, haematuria, rectal bleeding, or lower limb swelling due to lymphatic obstruction (Harlfinger et al., 2023b).

Despite the clinical clarity of these symptoms in the medical literature, their recognition and timely reporting remain limited in low-resource settings. Several studies in Sub-Saharan Africa have indicated that women often misinterpret early symptoms as regular reproductive events, benign gynaecological conditions, or sexually transmitted infections (Kidaya et al., 2025a; Priya et al., 2023a). Furthermore, cultural perceptions, stigma associated with reproductive health issues, as well as reliance on traditional healers further contribute to delays in health-seeking behaviour (Hasahya et al., 2016). In Namibia, where

rural women experience limited access to diagnostic services, symptom recognition and timely reporting are compounded by logistical impediments such as distance to health facilities, lack of transport, and costs of care. The evidence, therefore, indicates that while symptoms are well established in the biomedical literature, they often remain clinically underutilised in rural African contexts, where late-stage diagnosis predominates.

2.3.3. Cervical cancer epidemiology

2.3.3.1. Global perspective

Every two minutes, somewhere in the world, a woman dies from cervical cancer, a disease that is almost entirely preventable. Moreover, in 2020, there were an estimated 600,000 new cases and 340,000 deaths worldwide, with more than 85% of the burden occurring in low- and middle-income countries (LMICs) (Ferlay et al., 2021b; WHO African Region, 2024b). The disease is primarily caused by persistent infection with high-risk human HPV types, particularly HPV-16 and HPV-18, which are responsible for approximately 70% of cases (WHO, 2016a). More importantly, effective preventive measures are available, including HPV vaccination, routine screening, as well as timely treatment of pre-cancerous lesions. However, disparities in healthcare infrastructure, financial constraints, as well as limited awareness impede the universal application of these measures (Ghosh et al., 2024; Henke et al., 2021). High-income countries have recorded significant declines in incidence and mortality rates through well-organised screening programmes, particularly Pap smear testing. In contrast, many LMICs continue to report late-stage diagnoses and poor survival outcomes, as preventive services remain underutilised or inaccessible (WHO African Region, 2024a). This disparity underscores the persistent inequities in cervical cancer prevention and control globally, reinforcing its designation as both a disease of poverty and of inequity.

2.3.3.2. African context

It is imperative to note that Sub Saharan Africa bears a disproportionate share of the cervical cancer concentration with incidence rates estimated between 30-40 cases per 100,000 women, compared to fewer than 10 per 100,000 in most high-income countries (Bray et al., 2024c; Ferlay et al., 2021b). Furthermore, mortality rates reflect these disparities, reflecting persistent structural, socio-economic, and health system barriers. Studies attribute this high prevalence to inadequate health education programmes, low levels of formal education among women, limited healthcare infrastructure, as well as underdeveloped HPV vaccination and screening services (Akanda et al., 2022). These factors contribute to late-stage presentation and poor prognosis (Chelva et al., 2024a; Maseko et al., 2015b; Oleribe et al., 2019a). Moreover, traditional and religious beliefs, stigma associated with gynaecological examinations, as well as misconceptions about cervical cancer causes further impede early detection. In addition, severe shortages of cervical cancer prevention (CECAP) trained healthcare personnel, coupled with the overburdening of existing staff and limited screening facilities, exacerbate service inequities, particularly in rural and underserved settings (Atnafu et al., 2024).

Although progress has been achieved in some countries, such as Rwanda and South Africa, where strong political commitment has enabled the implementation of wide-scale HPV vaccination programmes, most African nations still lag in scaling up comprehensive prevention strategies (Adams & Botha, 2024; Baussano et al., 2021). More importantly, this underscores the urgent need for context-specific, sustainable interventions to enhance the uptake of vaccination and screening, particularly in rural and marginalised communities.

2.3.4. Cervical cancer prevention and control

Cervical cancer prevention is structured around the three classical levels of prevention: primary, secondary, and tertiary, with palliative care increasingly recognised as an imperative dimension of tertiary prevention.

i) Primary prevention: reducing the risk of HPV infection and promoting safe sexual behaviour

Primary prevention targets the reduction of HPV infection risk. Moreover, the most decisive intervention is HPV vaccination, which protects against the most oncogenic types (Aviv, 2022; Mpunga et al., 2020). High-income countries that introduced HPV vaccination early, such as Australia and the United Kingdom, have recorded substantial declines in HPV prevalence and precancerous cervical lesions (Drolet et al., 2019). Furthermore, in Sub-Saharan Africa, Rwanda is a notable example of high vaccine uptake through school-based programmes and strong political commitment (Baussano et al., 2021). In contrast, other countries struggle with costs, health system readiness, and community hesitancy. Notably, Namibia integrated HPV vaccination into its national immunisation programme in 2025. In addition to vaccination, the promotion of safe sexual practices is an imperative primary prevention strategy. Consistent condom use reduces however does not eliminate the risk of HPV transmission, as the virus can infect areas not covered by condoms (CDC, 2022). Nonetheless, condoms protect against other sexually transmitted infections (STIs) that act as cofactors in cervical carcinogenesis, such as Chlamydia trachomatis and HIV (Kutto, 2015). Equally important, evidence also indicates that delaying sexual intercourse, reducing the number of sexual partners, as well as encouraging mutual monogamy can lower HPV transmission risk (Bruni et al., 2019). These behavioural interventions are particularly relevant in high HIV-prevalence contexts such as Namibia, where HIV co-infection accelerates the progression from HPV infection to invasive cervical cancer (UNAIDS, 2023). However, the literature indicates that the success of safe sex promotion depends on comprehensive sexuality education, gender norms, as well as empowerment of women to negotiate condom use, factors that are often constrained in rural African settings (Nyambe et al., 2019a).

ii) Secondary Prevention (screening & early treatment of precancerous lesions).

Secondary prevention focuses on detecting as well as treating precancerous changes before they develop into invasive cervical cancer. Moreover, several methods are supported in literature, each with distinct advantages and limitations. The Pap smear (cytology), introduced in the mid-20th century, has been the foundation of screening in high-income countries (Aviv, 2022). It involves collecting cells from the cervix with a small brush or spatula, smearing them onto a glass slide, and examining them under a microscope

for abnormalities (IARC, 2023). It is imperative to note that this test is highly effective when performed regularly, and large-scale programmes in countries such as the United States and Finland have led to dramatic reductions in incidence and mortality (Aviv, 2022). However, Pap smears require laboratory infrastructure, skilled cytologists, and reliable follow-up systems, rendering them resource-intensive moreover challenging to sustain in many LMICs.

By contrast, VIA is a low-cost, point-of-care alternative recommended by the WHO for LMICs (WHO, 2021). Furthermore, during VIA, a nurse or trained health worker applies diluted vinegar (acetic acid) to the cervix during a pelvic examination. Areas with abnormal cells temporarily turn white ("acetowhite" changes), which can be observed with the naked eye or with a simple light source. VIA has the advantage of providing immediate results, which enables a "screen-and-treat" approach, meaning that if an abnormality is detected, the woman can receive same-day treatment, such as cryotherapy (the freezing of abnormal tissue). More importantly, this approach assists mitigate the challenge of women being lost to follow-up, a common problem in rural or resource-constrained contexts. While VIA is not as precise as HPV DNA testing or cytology, it remains a practical as well as life-saving method in areas with limited resources (Bray et al., 2024).

More recently, HPV DNA testing has been recognised as a superior method because of its high sensitivity and ability to detect high-risk HPV infections even before cellular changes occur. Moreover, the test involves collecting a cervical or vaginal sample, which is then analysed in a laboratory for the presence of HPV DNA. It can also be performed using self-collected vaginal swabs, which increases acceptability among women who may be uncomfortable with pelvic examinations (IARC, 2023). However, widespread use of HPV DNA testing is currently constrained in LMICs by high costs and limited laboratory infrastructure. In Namibia, secondary prevention has relied mainly on VIA since 2018, primarily targeting women living with HIV, who are at higher risk of cervical cancer due to reduced immune clearance of HPV (Mbadhi et al., 2024). By 2025, Namibia expanded its strategy to include HPV DNA testing alongside Pap smears in selected facilities, reflecting a shift toward more sensitive diagnostic tools (MoHSS, 2025). Despite these advances, rural coverage remains low, moreover studies underscore persistent impediments including poor awareness, cultural fears, transportation difficulties, as well as shortages of trained staff.

iii) Tertiary prevention: treatment of invasive cervical cancer

Tertiary prevention in cervical cancer focuses on the treatment of invasive disease to control progression, reduce complications, and prolong survival. Globally, the three standard treatment modalities are surgery, radiotherapy, and chemotherapy (WHO, 2016c). Surgery refers to the removal of cancer through an operation; in the case of cervical cancer, this may involve removing part of the cervix or the entire uterus (hysterectomy), depending on the disease stage. Moreover, radiotherapy employs high-energy beams, such as X-rays, to destroy cancer cells, either externally directed to the pelvis or internally delivered through brachytherapy, where a device is placed inside the vagina to target the tumour directly. Chemotherapy entails administering patients' cancer-fighting drugs, usually through a vein, which travel through the bloodstream to kill cancer cells or stop them from multiplying. These three treatments may

be administered alone or in combination; for example, surgery is often conducted in the early stages of disease, whereas radiotherapy and chemotherapy are typically combined for advanced disease. While these interventions have significantly improved outcomes in high-income settings, their effectiveness depends heavily on the stage at which the cancer is diagnosed (IARC, 2023).

Furthermore, evidence from high-income countries demonstrates substantial improvements in survival when invasive cancer is detected early, moreover treated with these interventions (IARC, 2023). In low- and middle-income countries (LMICs), however, late presentation remains a significant impediment, with numerous women only seeking care when the disease is advanced and less responsive to treatment (Akanda et al., 2022a). In addition, the availability of oncology infrastructure in Sub-Saharan Africa is also limited, with a scarcity of radiotherapy units, a shortage of oncology specialists, as well as frequent stockouts of chemotherapy agents, all of which compromise timely and effective treatment (Ginsburg et al., 2017).

In Namibia, tertiary-level services are concentrated in urban centres, particularly in Windhoek, the capital city, where the Namibian Oncology Centre (NOC) offers chemotherapy and radiotherapy. While this facility represents progress, its centralisation means that rural women encounter significant impediments to access, including long travel distances, high transport and accommodation costs, as well as time away from work or caregiving responsibilities. Furthermore, even when treatment is reached, women frequently present at advanced stages, limiting the possibility of curative intervention (Cancer Association of Namibia [CAN], 2023). The literature outlines that this pattern reflects broader regional experiences, where geographic inequities as well as late diagnosis undermine the effectiveness of tertiary prevention.

More importantly, palliative care is increasingly recognised as a significant component of tertiary prevention, particularly in LMICs where most cervical cancer cases are diagnosed at late stages. The World Health Organisation defines palliative care as holistic support that addresses physical, psychosocial, and spiritual suffering, beginning at diagnosis and continuing alongside curative or life-prolonging treatments (WHO, 2018). However, in SSA, palliative care remains underdeveloped, underfunded, and largely urban-based. Impediments include restrictive opioid policies that limit access to pain relief, a lack of trained providers, as well as stigma surrounding end-of-life care (Krakauer et al., 2021a).

Moreover, Namibia reflects an intermediate stage of palliative care development, with foundational initiatives however limited reach. Donor-supported programmes in the 2000s sought to integrate palliative care into HIV and cancer services, focusing on policy development, staff training, drug access, and service delivery. Notably, these initiatives laid some groundwork, however their scope was limited, and sustainability was weak once donor support ended (Freeman et al., 2016). Morphine and other essential analgesics remain primarily restricted to hospital settings, moreover prescribing authority is limited to doctors, which restricts their availability in rural areas. The establishment of a 22-bed palliative care centre by the Cancer Association of Namibia in Windhoek in 2024 marks a milestone, providing specialised inpatient support for symptom management, psychosocial counselling, and holistic care (MoHSS, 2025a). However, this facility remains urban-centred and cannot meet the national need. Studies

suggest that community-based palliative care services are minimal, with most rural women reliant on untrained family caregivers, further compounding inequalities (Krakauer et al., 2021b).

The literature underscores that political and financial support for palliative care in Namibia remains inconsistent. While policies such as the Community-Based Health Care Policy reference palliative care, they lack operational details, tariff structures, as well as integration with primary healthcare, resulting in fragmented implementation. Moreover, cultural discomfort in discussing death and limited public awareness also contribute to the underutilisation of existing services (MoHSS, 2025a). These findings reflect broader regional challenges, where paternalistic communication styles and stigma limit patients' autonomy in expressing preferences for end-of-life care.

2.3.5. Cancer policies in Namibia

In Namibia, the MoHSS is responsible for designing and implementing policies that establish the national framework for cancer prevention, control, and treatment services. Moreover, over the past decade, several strategies have been introduced to address the growing cancer burden. The most notable include the National Cancer Control Plan (2016-2020) and the National Strategic Framework for Cancer Control (2022-2027), both of which were developed to strengthen prevention, early detection, treatment, as well as palliative care for priority cancers, including cervical cancer. Importantly, these frameworks align with the World Health Organisation's recommendation for comprehensive cancer control and recognition of equity as a guiding principle in health service delivery.

Despite this emphasis, however, policy provisions remain limited in their practical articulation of mechanisms to guarantee equitable access to services. While the national plans acknowledge urban-rural disparities and the vulnerability of women living with HIV who encounter a markedly higher risk of cervical cancer, they do not sufficiently outline resource allocation strategies, financial protections, or culturally tailored interventions to mitigate these inequities. As in other LMICs, the gap between policy and implementation persists, particularly in rural communities where health system constraints, workforce shortages, and infrastructural limitations undermine service uptake. Furthermore, cervical cancer-specific interventions have been mainstreamed into broader reproductive health and HIV programmes, with policies supporting visual inspection with acetic acid (VIA), ablative treatment, and, most recently, HPV vaccination and HPV DNA screening.

Understanding that cervical cancer unfolds within complex social, cultural, political, and economic contexts is imperative for analysing the efficacy of these policies. As Asangbeh-Kerman et al. (2022) argued, comprehensive health policies should address not only clinical interventions however also broader determinants of health, including empowerment and social equity (Asangbeh-Kerman et al., 2022). Furthermore, while Namibian cancer policies outline equity in principle, they lack strong measures for overcoming known impediments such as poverty, cultural stigma, as well as limited health literacy in rural areas. This creates a gap between policy intent and community realities, with implications for prevention, treatment, and palliative care. Importantly, recent global evidence demonstrates that inequalities in cancer care persist along intersecting axes of gender, age, income, and geography. In

Namibia, these inequities are similarly entrenched, particularly affecting rural women, those of lower socio-economic status, and those living with HIV. While progress has been made in policy formulation, the gap in policy implementation as well as equity-driven programming continues to constrain the country's ability to achieve the WHO elimination targets comprehensively.

2.4. Knowledge, attitude and practices of cervical cancer prevention

2.4.1. Knowledge of Cervical Cancer Causes, Symptoms, and Risk Factors

Knowledge is foundational in determining health-seeking behaviour, particularly for preventable diseases such as cervical cancer. Numerous studies have explored awareness of cervical cancer, its causes, risk factors, prevention, and screening methods (Getachew et al., 2019; John-Akinola et al., 2021; Khanna, 2021). However, studies in Namibia and other Southern African settings indicate a recurring pattern: high levels of disease awareness (i.e., recognition that 'cervical cancer' exists) alongside poor knowledge of causes and prevention, in particular the role of HPV and the interaction with HIV (Anyolo et al., 2024b; Ebu et al., 2019a; Mbulawa et al., 2023). Moreover, measurement challenges (binary awareness questions) and structural impediments (limited services, stigma, low SRH integration) likely explain why awareness does not consistently predict screening uptake. A study conducted in Lüderitz in Namibia, indicated that while 92.3% of participants knew of cervical cancer and Pap smears, the knowledge of associated causes and risk factors like HPV co-infection with HIV, having multiple sexual partners, early sexual intercourse, as well as smoking were much lower, with only 39.7% identifying HPV being a risk factor, and even less identifying some of the other risk factors (Hausiku et al., 2022). Similarly, in Ethiopia, only 21.1% of women identified at least one symptom of cervical cancer, for instance, inter-menstrual bleeding (8.7%), while 23.2% identified any risk factors, and the most common was multiple partners (12.1%) (Destaw et al., 2021a). In Zanzibar, women's knowledge was also low, and a significant association was observed between awareness levels and educational level, household income, as well as having cancer personally or in the family (Weng et al., 2020).

In a broader study across Uganda and South Africa, Moodley et al. (2020) revealed that while 89.4% of women had heard of cervical cancer, only 38.1% could recall a risk factor, and 57.7% a symptom. Recognition of specific risk factors like HPV (23.7%), HIV (46.8%), and not being screened (26.5%) was generally low (Moodley et al., 2020a). Importantly, in all these studies, it is notable that awareness in general (just knowing about cervical cancer) was consistently high and, in fact, always above 89%. However, knowledge regarding signs, causes, and preventative measures is lacking. Moreover, education, socioeconomic status, and cancer experience (for example, knowing someone with it) were also consistently associated with higher knowledge. There are, of course, some variations.

While these studies indicate emerging trends, it is also imperative to note their limitations. Furthermore, most of these studies employed quantitative measures, which can overestimate actual knowledge, such as social desirability bias or recall bias. Moreover, most studies only adopted simple awareness measures, such as "Have you heard of cervical cancer?", which are not particularly advanced measures of knowledge. Additionally, the literature has a geographical gap, particularly regarding rural, underserved areas such as

Ohangwena and Kavango West in Namibia. Notably, there has not been enough research on these or any other instances, other than urban populations and isolated studies in towns, where it is challenging to generalise to rural and remote communities. Current literature suggests a clear trend of insufficient depth of knowledge regarding causes, symptoms and risk factors of cervical cancer in Sub-Saharan Africa, though superficial knowledge is often present.

Across the reviewed studies, a theme that emerged dominant suggests that knowledge alone is insufficient to drive preventive behaviours. Moreover, low knowledge is often associated with poor screening uptake, as indicated by Tadesse et al. (2022) and Kashaka et al. (2022), even in settings with relatively high knowledge levels, such as among students enrolled in health sciences courses (Asweto et al., 2020). In addition, there is a critical need to connect health education with health system interventions. The WHO's global strategy to eliminate cervical cancer recommends for integrated approaches by combining awareness campaigns with accessible screening and vaccination services (World Health Organisation, 2020). Furthermore, literature indicates that knowledge is more impactful when embedded in enabling environments, where communities have the means to act on what they know.

2.4.2. Awareness of HPV and HPV vaccination

Although HPV is a leading cause of cervical cancer, many low- and middle-income countries, including Namibia, have little understanding and awareness of HPV and its vaccine. Furthermore, in several studies, knowledge of HPV was significantly lower than general awareness of cervical cancer. In Namibia, Amukugo et al. (2018a) found that 39.7% reported having heard of HPV, as well as having heard of it as a leading cause of cervical cancers was even significantly lower than that. This follows a global trend, where regions with limited public health outreach have demonstrated a general lack of knowledge about HPV and the subsequent vaccine. In Ghana, a study indicated that while 75.6% of adolescent girls had heard of cervical cancer, only 12.6% had heard of HPV, which was even lower for vaccine awareness (Diallo et al., 2023). Importantly, some misconceptions regarding the vaccine, such as being unsafe, encouraging early sexual activity, or that it is not necessary for girls who are not sexually active, contributed to vaccine hesitancy and low vaccine uptake (Diallo et al., 2023). Similarly, in South Africa, Hoque and Van Hal (2020) found that only 31.8% of their university students surveyed possessed accurate knowledge related to HPV, despite being a more educated demographic (Hoque & Hoque, 2009).

Cultural beliefs, misinformation, as well as mistrust in the healthcare system have also contributed to attitudes toward the HPV Vaccine. In Malawi, both parents and community representatives expressed concerns regarding safety and myths related to fertility, which predominantly impacted vaccine acceptance for adolescent girls (Munthali et al., 2015a). Moreover, several studies have noted contributions regarding the role of religion and community, as well as their association with impediments and the need for culturally relevant health education campaigns. Nevertheless, with structured information, studies have indicated support for the uptake of the vaccine. In Kenya, awareness campaigns increased the acceptance of the HPV vaccine from 45% to 77% among girls and their parents (Gebreegziabher et al., 2024a, 2024b). The findings suggest that education and community involvement are effective instruments for promoting consensus as well as correcting misinformation. Equally important, the literature suggests a gendered gap in knowledge around HPV, including the notion that

men, who generally fulfill an imperative function in decision-making, particularly in patriarchal communities, are typically not included in HPV and cervical cancer education campaigns (Dsouza, Van den Broucke, et al., 2022; Louis, 2019). When combined with the HPV vaccination campaign, men can potentially become influential communicators in enabling not only their families, but also the community to understand the importance of HPV vaccination programs.

2.5. Attitudes

In this study, attitudes are expressed as beliefs about susceptibility to disease, perceived severity, perceived benefits of preventive action, perceived impediments to action, cues to action and self-efficacy. While awareness and knowledge of prevention are the imperative first steps, attitudes fulfill a crucial function in intent, moreover, depending on the context, create a critical inflexion point between knowledge and action.

Furthermore, numerous studies demonstrate the importance of attitudes toward screening for cervical cancer and having the HPV vaccine. For example, Tadesse et al. (2022) found that when surveying Ethiopian university women, 64.4% believed cervical cancer could be prevented (Tadesse et al., 2023). However, only 39% reported a positive attitude toward screening, citing fear of pain and embarrassment as reasons. Similarly, Ndakukamo et al. (2025) reported that while Namibian women acknowledged the benefits of screening, negative attitudes created by fear of a positive result or mistrust of the healthcare system, indicated that they did not access the services.

Just a few years ago, Moodley et al. (2020) reported on attitudes from women in Uganda and South Africa, noting that for many, the attitude about cervical cancer was a fatalistic position of considering it a “death sentence” to endure when they had moderate levels of awareness. However, fatalistic positions were most prominent in participants from rural areas, reflecting cultural stories of disease about cancer as generally incurable. In studies of university students in Namibia and South Africa, researchers reported relatively more positive attitudes towards the HPV vaccine and screening, which were correlated with greater knowledge as well as prior exposure to digital health information (Amukugo et al., 2018b; Ndubuisi et al., 2024).

Remarkably, attitudes vary based on age, residency, and even gender groups. For example, a survey in Zambia by Nyambe et al. (2019) revealed that while women demonstrated a willingness to request screening if referred by a healthcare worker, men often had indifferent or negative attitudes toward encouraging their partners to do the same. Moreover, the gendered difference in male attitudes toward their partner's reproductive health screening is supported by Mwenda (2019), who argued that the males' detachment from the scope of reproductive health issues limits women's relative decision-making autonomy in a patriarchal community. On the topic of decision-making, there are also differences in stated intentions and their actual behaviours. Mwenda (2020) further noted that in a study of female health science university students in Kenya with a high awareness and a specifically positive attitude toward infection screening, the screening they reported was below 20%. From this, even with a favourable

attitude, screening activity was unlikely due to the continued existence of cost, social stigma, lack of spousal support, as well as system challenges (Mwenda, 2019).

While many studies acknowledge that attitude is an imperative predictor, inconsistencies of conceptual and methodological approaches render systematic comparisons across studies impossible. Studies often explore attitude with either behaviour or knowledge, failing to distinguish constructs or assess psychometric characteristics. Furthermore, some studies operationalise attitude as a single item (e.g., "Do you agree cervical cancer is significant from a public health perspective?"), whereas others employ multi-item scales to better encapsulate beliefs about vulnerability, the perceived benefit, and the perceived barriers via Likert-type responses. Additionally, several KAP studies are cross-sectional in design, which renders it challenging to establish causality. Moreover, very few studies in sub-Saharan Africa have adopted longitudinal or intervention designs, along with pre- and post-education or community engagement, to assess changes in attitude. The reliance on quantitative designs also presumably limits the consideration of social and cultural aspects often associated with attitudes. In contrast, qualitative articles, such as those by Taghizadeh Asl et al. (2020), have documented that attitudes are maintained by deep cultural and religious norms, as well as fear of shame or infertility, which may not be easily captured within surveys.

Across many different contexts, negative attitudes toward cervical cancer prevention are often stigmatised, impeded by structural and misinformation variables. These variables are not mutually exclusive and reinforce one another. For example, if a woman believes Pap smears can make her infertile or remove her womb (misinformation), she may fear a Pap smear (emotional barrier). However, she will feel hesitant if the service is far and unsupportive (structural barriers). In addition, the literature associates healthcare workers' attitudes and behaviours with those of their communities. For example, Ndakukamo et al. (2025) postulate that negative interactions with healthcare providers, such as judgmental attitudes as well as inadequate confidentiality and privacy, deterred women from returning for repeat screenings despite initially holding more positive attitudes. This suggests a recommendation for changing healthcare providers' attitudes and introducing training that includes sensitivity and culturally appropriate communication skills.

Furthermore, positive community attitudes can create normative change, as evidenced in Rwanda by the implementation of school-based vaccination campaigns, which significantly improved attitudes toward screening (Sayinzoga et al., 2020a). It is imperative to note that multilevel and intergenerational interventions are limited in Namibia. In reducing cervical cancer, even with a national cervical cancer prevention policy, few campaigns actively sought to change attitudes, particularly among underserved populations, rural populations, or marginalised communities (MoHSS, 2020). Thus, there is an unintended missed opportunity to use policy to seek a culturally appropriate attitudinal change approach.

Attitudes are centrally located within the continuum of cervical cancer prevention, which includes screening, vaccine acceptance, and/or vaccine uptake. Moreover, numerous women may have favourable attitudes and beliefs about the preventability of the disease, however this does not always translate into prevention behaviours. Cultural fears, distrust of the health systems, as well as gender norms shape attitudes, particularly in LMIC. To have effective cervical cancer prevention efforts, particularly in rural Namibia, greater initiatives need to be made to reshape community and individual attitudes. Simply

providing information will not be adequate; instead, engaging with trusted community players adopting health care system-based approaches and communication should be facilitated in a culturally appropriate way to prevent diseases successfully.

2.6. Practice in cervical cancer prevention

Across SSA, empirical studies continually indicate low uptake of HPV vaccination and cervical cancer screening as primary and secondary means of preventing cervical cancer (Castle, 2024). Moreover, a community-based study in Ethiopia by Tadesse et al. (2023) revealed that the uptake of cervical cancer screening was 12.87%, and that knowledge of cervical cancer increased screening uptake by almost five times (OR: 4.81; 95% CI: 3.06, 7.54). In Namibia, a study by Hausiku et al. (2022) indicated that in Lüderitz, women had high knowledge levels about cervical cancer and Pap smear testing. However, less than half of them had undergone screening.

Moreover, a comparative analysis revealed that education level, media exposure, as well as access to healthcare are variables that determine the likelihood of screening. For instance, a study exploring four sub-Saharan African countries indicated that women with higher education and media exposure were more likely to practice cervical cancer screening (Anaman-Torgbor et al., 2020a). Similarly, in Namibia, estimates of screening coverage vary depending on the data source and definition used. Furthermore, a 2025 community survey reported that fewer than half of women never had a Pap smear despite very high awareness. National programme planning documents adopt a baseline screening coverage estimate (~41.5% among priority populations) to set targets for scale-up to 70% (Castle, 2024).

In addition, although awareness levels may be high, screening practices are low, suggesting a gap between knowledge and action. According to a study conducted in Cameroon and Zimbabwe, 90% of mothers accepted the HPV vaccine, while only 8% of mothers had their daughters vaccinated (Tekle et al., 2020). This difference signifies other beliefs, including cultural and accessibility factors, that may fundamentally influence practices. Moreover, misinformation, particularly the persistent myth that the HPV vaccine causes infertility, and general safety concerns have been documented as imperative indicators of parental refusal in several African contexts (Isabirye et al., 2020; Mapanga et al., 2019). Communication strategies that engage parents, schools, community, and religious leaders, as well as provide clear safety monitoring information, reduce hesitancy. Importantly, Namibia's 2025 roll-out included targeted RCCE steps to address misinformation. While a few studies acknowledge impediments to practicing cervical cancer prevention practices, more longitudinal and interventional research is warranted to clarify the causes and effectiveness of the interventions. Another aspect of the studies is that most of the data are self-reported, which may be influenced by social desirability bias. Additionally, qualitative studies do not examine the contextual and nuanced cultural and personal factors that influence women's decisions about screening and vaccination.

It is imperative to note that although knowledge of cervical cancer and its prevention methods has increased, there is still a need for improvements in actual practices, such as screening and vaccination, processes that remain sub-optimal in many SSA contexts, including Namibia. Furthermore, multi-faceted approaches address the educational, cultural and systemic impediments that will close the gap between

knowledge and practice. Future studies can focus on longitudinal studies as well as culturally competent interventions that increase the capacity and efficacy of cervical cancer prevention strategies.

2.7. Health-seeking behaviour and cervical cancer prevention

Health-seeking behaviour, as defined by Museko et al., (2017), refers to an individual's initiatives to find appropriate medical care concerning perceived health problems or diseases. Moreover, health-seeking behaviour is significant to health outcomes, with the time taken to seek medical care as a key variable influencing health outcomes, as well as a delay in seeking medical care as a risk factor for poorer health outcomes (Moore, 2024). Health-seeking behaviour is fundamental to prevent and detect cervical cancer, as well as highly relevant in determining uptake of cervical cancer screening. Determinants of screening and vaccination uptake are framed based on the Health Belief Model.

Evidence from Namibia and the region suggests: (1) perceived susceptibility is often low or misunderstood despite high awareness; (2) perceived severity of cervical cancer is high however does not always translate to action; (3) perceived benefits of screening/vaccination are undermined by perceived impediments (access, cost, fear, misinformation); (4) provider recommendation (cue to action) and self-efficacy increase uptake. Moreover, in a study conducted in Arba Minch Town, Southern Ethiopia, only 47.6% of women aged 30-49 years demonstrated health-seeking behaviour in relation to cervical cancer screening (Kussia et al., 2024a). Furthermore, in Morocco and Pakistan, only 14.2% of the women exhibited lower health-seeking behaviour during the study period (Lurgain et al., 2024). Depending on knowledge, perceived susceptibility, perceived severity, as well as perceived benefits of health-seeking behaviour, such as cervical cancer screening, all may be relevant in examining health-seeking behaviour. In Hossana Town, Hadiya zone, Southern Ethiopia, health-seeking behaviour and perceived susceptibility (AOR = 3.63), perceived severity (AOR = 2.65), and perceived benefit (AOR = 4.85) were all significantly associated with health-seeking behaviour (Habtu et al., 2018).

Notably, when comparing countries or populations, health-seeking behaviours can vary considerably. For example, in Ethiopia, studies indicate that only 19.8% of women had heard of cervical cancer and just 15.5% were aware of screening services (Abraham et al., 2018). Conversely, a community-based intervention in Nigeria that combined health education with free cervical cancer screening significantly improved participation rates, increasing uptake from 11.2% to 29.7% (Okyere et al., 2022). Unlike Ethiopia, where low awareness limits health-seeking behaviour, the Nigerian approach addressed impediments by raising knowledge and removing financial constraints. Similarly, a Kenyan study demonstrated that once women were informed about HPV self-sampling strategies, many considered the option acceptable and feasible, with uptake strongly influenced by family and peer support (Nyambe et al., 2018). More importantly, Namibia has yet to fully implement such community-driven initiatives, though evidence suggests that culturally tailored awareness campaigns as well as accessible services fulfill a pivotal function in improving screening uptake. Furthermore, community messaging encompasses mass media (radio, TV), school-based engagement, community meetings, and interpersonal channels, including community health workers and religious/traditional leaders.

Despite the increase in screening options, the highest uptake remains pertinent due to sociocultural challenges related to health-seeking behaviour or systemic barriers. For instance, in Kenya, women diagnosed with cervical cancer often reported feeling stigma related to the diagnosis and frequently delayed in seeking medical treatment due to their beliefs that the disease was linked to witchcraft or moral failings (Uwimana et al., 2023). Moreover, in Rwanda, participants reported favourable attitudes towards the HPV vaccine among their parents; however, poor access and misinformation limited uptake (Uwimana et al., 2023). These contrasts, among others, demonstrate the scope of health-seeking behaviour and how challenges such as health system limitations, stigma, and a lack of support may threaten the promotion of prevention.

The literature indicated a relationship among knowledge, attitude, and behaviour concerning cervical cancer outcomes. Moreover, educational campaigns targeted at men and women, particularly those that include social support and culturally sensitive messages, can change attitudes and promote timely health-seeking behaviour. By integrating cervical cancer screening with mobile outreach campaigns, access to services could be improved (Castle, 2024). Furthermore, integrated approaches to cancer screening have proven successful in several African settings. For example, Rwanda integrated cervical cancer screening into its existing HIV/AIDS programmes, significantly improving coverage and early detection rates (Binagwaho et al., 2018). Similarly, Zambia's "see and treat" strategy, incorporated into HIV care, expanded access to screening among high-risk women (Mwenda et al., 2019). Compared to stand-alone screening services, integration maximises existing infrastructure, staff, and community trust. However, critics note that integration may strain already overburdened HIV clinics, leading to uneven implementation. These findings connect directly to Namibia, where high HIV prevalence suggests a substantial potential for the adoption of similar approaches to strengthen the integration of cancer screening models and increase uptake. Understanding the relationships between these factors suggests lymphatic interventions that consider individual, community and systemic contexts for health behaviour.

Furthermore, health-seeking behaviour is a critical variable in cervical cancer prevention and control. Despite the increase in service availability in some parts of sub-Saharan Africa, these services are poorly accessed due to impediments, including awareness, socio-cultural beliefs as well as systemic reasons. More nuanced, contextually aware strategies are needed to facilitate women's access and use of preventive services.

2.7.1. Determinants of health-seeking behaviour in cervical cancer prevention

The World Health Organisation defines health as a state of complete physical, mental, and social well-being, not merely the absence of disease or infirmity (WHO, 2020). Building on this, determinants of health are the broad range of personal, social, economic, as well as environmental variables that influence health outcomes (Tapera et al., 2019). Unlike biomedical perspectives that focus solely on disease pathology, the determinants approach emphasises the interconnected influences shaping behaviours and outcomes. Moreover, a complex interplay of individual, socio-cultural, economic, as well as systemic determinants shapes health-seeking behaviour in cervical cancer prevention. Despite the preventable nature of cervical cancer through HPV vaccination and early screening, the uptake of these services remains low in many LMICs, especially in SSA, including Namibia (Ferlay et al., 2020). Understanding the specific determinants is essential for designing targeted interventions.

- **Knowledge and attitude**

Knowledge is a fundamental starting point in shaping health-seeking behaviour. Moreover, once individuals gain awareness, it influences their attitudes, shaping perceptions of susceptibility, severity, and benefits of screening and eventually their behaviours (Glanz et al., 2015). For example, studies in Uganda indicate that women who understand the link between HPV and cervical cancer are more likely to participate in screening (Moodley et al., 2020b). Furthermore, in Rwanda, for example, awareness was a strong predictor of cervical screening uptake, while in Nepal, community education campaigns significantly increased knowledge as well as willingness to participate in HPV self-sampling programmes (Darj et al., 2019a; Uwimana et al., 2023a). This demonstrates the importance of reinforcing the knowledge–attitude–behaviour pathway with supportive health systems as well as culturally responsive messaging in Namibia.

- **Accessibility and Infrastructure**

According to WHO guidelines, primary healthcare facilities should ideally be located within a 5 km radius of the communities they serve (WHO, 2008). In Namibia, however, many rural populations travel 10-15 km or more to reach the nearest health facility (MoHSS, 2017). Compared to urban populations with better access, rural women encounter disproportionate challenges in attending routine screenings. Moreover, physical accessibility, including distance to health facilities, inadequate transportation, as well as limited availability of screening services, has been identified as a significant impediment. A study by Maseko et al. (2015) in Malawi revealed that women in rural communities often travel long distances to access screening services, discouraging timely care. Similarly, in Namibia, regional disparities in service provision limit access in remote areas (Ndakukamo et al., 2025). While long-distance travel has been identified as an impediment in many LMICs, the lack of precise data on average travel distances in Namibia weakens policy responses. This gap underscores the need for context-specific data on geographical accessibility to inform cervical cancer prevention strategies.

- **Affordability**

Namibia allocates approximately 12% of its Gross Domestic Product (GDP) to health, which is close to the Abuja Declaration target of 15% (WHO, 2022). Moreover, at public facilities, most citizens pay minimal fees, often less than NAD 8 per visit, however only if they can afford it; if not, treatment is free of charge. However, affordability is complicated by indirect costs such as transportation, childcare, and lost wages (Mengistie et al., 2025a). In comparison, high-income countries address such impediments through insurance and social protection, which are less robust in Namibia. This paradox of low formal costs however high indirect costs explains why many women still perceive health services as unaffordable despite government subsidies. Linking this to Universal Health Coverage (UHC), it indicates gaps in financial protection for vulnerable groups. Thus, financial impediments continue to be a significant determinant. Even when screening services are subsidised or free, indirect costs deter women from seeking care (Okyere et al., 2022). In Ghana, Osei-Asibey et al. (2023) discovered that women from lower-income households were significantly less likely to attend screening appointments.

- **Availability**

Availability refers to the presence of sufficient health personnel, equipment, and supplies necessary to deliver effective services (Mengistie et al., 2025b). Even when facilities are geographically accessible, shortages of trained staff, screening tools, as well as laboratory infrastructure undermine the effectiveness of prevention programmes. For instance, studies in Uganda and Nigeria frequently underscored stock-outs of acetic acid for VIA and limited access to cryotherapy equipment, resulting in missed screening opportunities (Mwaka et al., 2015; Eze et al., 2019). More importantly, Namibia encounters similar challenges, including shortages of trained healthcare providers and an uneven distribution of services, which limits screening coverage, particularly in rural districts (MoHSS, 2019). Compared to high-income countries with well-resourced health systems, LMICs challenging to maintain consistent service availability. Furthermore, critics postulate that strengthening the health system, including training, supply chain management, as well as decentralisation of services, is fundamental to make cervical cancer prevention widely available. In the context of Namibia, increasing investment in human resources and equipment will be crucial to meeting the WHO's elimination targets.

- **Acceptability**

Acceptability is defined as the degree to which health services are perceived as culturally appropriate, respectful, as well as responsive to the values and expectations of the community (WHO, 2017). Furthermore, acceptability is particularly pivotal in cervical cancer prevention, as screening involves intimate examinations that may generate embarrassment, fear, or mistrust. Studies in Kenya and Ethiopia report that women avoided screening due to concerns about privacy, gender of providers, and stigma associated with reproductive health services (Rosser et al., 2015; Getachew et al., 2019). Moreover, in Namibia, similar findings suggest that cultural taboos, myths linking screening to infertility, and mistrust of confidentiality discourage women from participating in programmes (Anyolo et al., 2024a). Compared to biomedical models that underscore availability and access, the acceptability dimension highlights how cultural norms and gender relations shape women's willingness to seek care. Critics note that interventions often overlook this determinant, focusing instead on supply-side barriers. Connecting this to Namibia, increasing community engagement, ensuring privacy, as well as training providers in culturally sensitive care are critical to improving the acceptability of cervical cancer prevention services.

- **Stigma and Cultural Beliefs**

Stigma is broadly defined as a socially constructed process in which individuals or groups are devalued or discriminated against due to a particular health condition, behaviour, or identity (Rosenstock, 1977). In the context of health, stigma manifests fear, shame, and avoidance of healthcare services, particularly for conditions associated with sexuality or morality. Cultural beliefs, on the other hand, refer to the shared values, traditions, and perceptions that shape how communities understand illness, health-seeking behaviours, and medical interventions (Idang, 2018). Moreover, stigma and cultural beliefs significantly influence women's attitudes and behaviours towards cervical cancer prevention. In many sub-Saharan African settings, cervical cancer is often associated with witchcraft, promiscuity, or divine punishment, resulting in stigma and silence around the disease (Mwaka et al., 2015; Ndejjo et al., 2017). Compared to biomedical explanations, these cultural narratives create fear, shame, as well as reluctance to access

screening services. Furthermore, studies from Uganda and Kenya demonstrate that women frequently avoid health facilities due to concerns about being labelled as sexually immoral (Mujugira et al., 2020). In Namibia, similar patterns exist, with some communities believing that cervical cancer screening may compromise fertility or cause harm, deterring women from seeking preventive care (Pick et al., 2021a). While awareness campaigns have attempted to dispel myths, critics argue that messaging often fails to address deeply rooted cultural frameworks, leaving stigma largely unchallenged. Importantly, this underscore the importance of culturally sensitive health education strategies that not only provide biomedical knowledge however also engage with local belief systems to enhance cervical cancer prevention in Namibia.

- **Gender Norms and Male Involvement**

Gender norms are defined as socially constructed expectations about appropriate roles, behaviours, and responsibilities for men and women within a given society (WHO, 2017). Closely linked to this, masculinity and femininity are cultural constructs that dictate male authority and female subordination, particularly in patriarchal societies (Shand et al., 2014). Furthermore, male involvement refers to the active participation of men in promoting and supporting their partners' health decisions, particularly in matters related to sexual and reproductive health (Shand et al., 2015). In many sub-Saharan African contexts, including Namibia, gender norms often position men as decision-makers, financial providers, and sexual gatekeepers, while women's autonomy to access healthcare is restricted. Moreover, studies reveal that women who need spousal permission to attend cervical cancer screening are less likely to do so compared to those who make independent decisions (Sekoni et al., 2022). Furthermore, male health-seeking behaviour is often characterised by denial, silence around sexual health, as well as avoidance of preventive services (Sekoni et al., 2022). Critics argue that most cervical cancer programmes target women exclusively, overlooking the significant influence of men in either facilitating or obstructing access to care. Relating this to Namibia, greater male engagement in reproductive health could challenge restrictive gender norms, reduce stigma, as well as improve the uptake of cervical cancer prevention interventions.

- **Trust in the Health System**

Trust in the health system is defined as the belief that health providers and institutions will act in the best interests of patients, ensuring safety, confidentiality, and respectful care (WHO, 2022). Moreover, within the health system, trust is a critical determinant of whether individuals engage with preventive services such as cervical cancer screening and HPV vaccination. Compared to high-income countries, where health systems are often perceived as reliable, many LMICs encounter challenges of mistrust due to under-resourced facilities, poor communication, as well as negative patient experiences (Oleribe et al., 2019a). Studies in Nigeria and Uganda indicate that women sometimes avoid screening because they perceive providers as judgmental or fear breaches of confidentiality regarding reproductive health information (Mwaka et al., 2015; Sekoni et al., 2022). In Namibia, some women prefer traditional healers, not because of a lack of biomedical knowledge, however because traditional providers are perceived as more approachable, trustworthy, and respectful of cultural beliefs (Ndakukamo et al., 2025). Furthermore, critics argue that health interventions often underestimate the importance of relational trust, focusing instead on technical or structural improvements. In the context of Namibia, strengthening trust in the health system requires improving patient–provider communication, ensuring confidentiality, as well as

integrating community leaders and traditional providers into health promotion strategies to bridge cultural and institutional gaps.

- **Psychological Barriers and Fear**

Fear of pain during the screening procedure, fear of results, or misconceptions about treatment side effects are psychological impediments influencing decision-making. Tadesse et al. (2022) found that even among educated Ethiopian university students, emotional discomfort and fear were prominent reasons for non-participation in screening. While these determinants are widely acknowledged, much of the literature lacks intersectional analysis. For instance, the interaction between economic status, rurality, and gender norms are often treated in isolation, despite their synergistic effect on health-seeking behaviour. Additionally, numerous studies are based on quantitative surveys that do not fully explore the lived experiences or local narratives that influence women's choices. There is also limited longitudinal research to assess whether interventions addressing these determinants result in sustained behaviour change. Furthermore, health-seeking behaviour studies often focus on women, while neglecting the roles of health workers, male partners, and community leaders as gatekeepers or facilitators of access. This narrow focus can miss critical determinants operating at the family and community level.

Importantly, these determinants are not isolated; instead, they are deeply interconnected. Low awareness often coexists with stigma and misinformation, while lack of access exacerbates fear and delay. The WHO's framework for people-centred health systems outlines that addressing health-seeking behaviour requires integrated strategies combining education, health service reform, gender empowerment, as well as community engagement (Aviv, 2022). Programmes that successfully increase screening uptake, such as Rwanda's school-based HPV vaccination programme and Nigeria's community outreach initiatives, address multiple determinants simultaneously (Bogale et al., 2024). For Namibia, addressing distance, affordability, and trust through mobile outreach, social mobilisation, as well as peer education could improve uptake of preventive care.

- **Socioeconomic factors**

Socioeconomic factors are broadly defined as the social and economic conditions that influence individuals' opportunities, behaviours, and health outcomes, including income, education, and occupation (Abila et al., 2022). Moreover, these determinants strongly shape women's ability to access cervical cancer screening. In urban areas of Namibia, numerous women are employed in informal or domestic labour, where missing a day of work translates into the loss of vital daily income. In rural areas, women often engage in subsistence farming and household responsibilities, which frequently conflict with the clinic's operating hours of 08:00–17:00. Compared to wealthier women with flexible employment and resources, women from poorer households encounter disproportionate impediments to preventive health services. Similar findings have been reported in Kenya and Uganda, where opportunity costs, such as lost wages, transportation expenses, as well as childcare responsibilities, deter women from attending screenings (Gatumo et al., 2018; Ndejjo et al., 2017). Furthermore, critics argue that current service delivery models remain rigid and do not adequately address the daily realities of women's lives. In the context of Namibia, flexible service delivery models, such as mobile outreach clinics, weekend services, as well as integrating

screening into routine care, are necessary to reduce socioeconomic impediments as well as improve equity in cervical cancer prevention.

2.8. Health system challenges in cervical cancer prevention

A health system is defined by the World Health Organisation (WHO, 2007) as the sum of all organisations, people, and actions whose primary intent is to promote, restore, or maintain health. Moreover, this includes service delivery, the health workforce, information systems, access to essential medicines, financing, as well as leadership or governance. Strong health systems are critical for implementing effective cervical cancer prevention programmes, as they determine the accessibility, availability, quality, and sustainability of services.

Furthermore, compared to well-resourced health systems in high-income countries that provide integrated screening, vaccination, and treatment services, numerous low- and middle-income countries (LMICs) struggle with systemic weaknesses, including limited infrastructure, shortages of trained staff, and fragmented service delivery (Atun et al., 2015). Evidence from sub-Saharan Africa indicates that these weaknesses directly contribute to low uptake of cervical cancer screening as well as delayed treatment (Chidyaonga-Maseko et al., 2015; Bruni et al., 2019). More importantly, in Namibia, the Ministry of Health and Social Services (MoHSS) has developed strategies to strengthen reproductive health; however, challenges persist, including limited diagnostic facilities outside major urban centres, shortages of skilled oncology staff, weak referral systems, as well as a heavy dependence on donor-funded vertical programmes (MoHSS, 2019).

Moreover, critics argue that over the past two decades, health system investments in Namibia and other LMICs have disproportionately focused on HIV as well as other infectious diseases, leaving reproductive cancers relatively neglected (Bruni et al., 2020a). This lack of integration between sexual and reproductive health (SRH) and HIV programmes has constrained opportunities to leverage existing infrastructures for cervical cancer prevention. Furthermore, understanding cervical cancer prevention requires examining the broader health system context. The WHO Health System Building Blocks framework provides a valuable lens for identifying and analysing challenges within service delivery, the health workforce, health information systems, access to essential medicines and technologies, financing, and leadership/governance. These interconnected components influence the availability, accessibility, as well as quality of cervical cancer prevention services in Namibia. Figure 3 illustrates the WHO health system building blocks as applied to this study.

2.8.1. Service delivery

Service delivery refers to how health services are organised, managed, and provided to populations. Moreover, WHO recommends that health services be people-centred, equitable, and integrated across prevention, treatment, and palliative care (WHO, 2017). Evidence from Rwanda and Malawi indicate that integrating cervical cancer screening into existing HIV as well as maternal health programmes has improved uptake (Bonful et al., 2022; Chidyaonga-Maseko et al., 2015). By contrast, fragmented services, limited rural outreach, as well as reliance on tertiary hospitals constrain access in many LMICs. In Namibia,

cervical cancer screening is mainly available in urban centres, with rural women relying on sporadic outreach campaigns (MoHSS, 2019). Furthermore, this centralisation creates inequities and missed opportunities for early detection. While countries like Rwanda have successfully implemented nationwide HPV vaccination programmes through school-based initiatives (Sayinzoga et al., 2020b)**,** others find it challenging to integrate services into existing health systems. India has launched an extensive campaign to train doctors to promote HPV vaccination, aiming to eliminate cervical cancer (Hombaiah et al., 2022)**.** Conversely, Tanzania encounters constraints, including limited treatment facilities and inadequate supplies, which impede service delivery (Chelva et al., 2024b). Additionally, the absence of clear referral pathways as well as follow-up care mechanisms contributes to loss to follow-up and delayed treatment. Thus, strengthening service delivery requires decentralising services, integrating cervical cancer prevention into existing health programmes, as well as establishing clear referral systems to ensure continuity of care.

2.8.2. Health Workforce

The health workforce includes all individuals engaged in actions whose primary intent is to improve health. WHO recommends adequate numbers of well-trained, equitably distributed staff (WHO, 2007). However, LMICs experience critical shortages of oncology specialists, nurses, and laboratory personnel, undermining the provision of preventive and curative services (Oleribe et al., 2019b). Moreover, Nigeria has a significant shortage of community health workers, with only two trained in cervical cancer prevention serving a clinic that caters to 10,000 people (Oleribe et al., 2019b). India's initiative to train thousands of doctors to promote HPV vaccination demonstrates a proactive approach to addressing workforce challenges (Singh et al., 2023)**.** Conversely, in Ghana**,** healthcare providers often lack training in cancer diagnosis and management, leading to missed diagnoses and delayed treatment (Malakoane et al., 2020). In Namibia, most cancer specialists are concentrated in Windhoek, leaving peripheral regions underserved (MoHSS, 2017). Compared to countries such as South Africa, which has more comprehensive oncology training programmes, Namibia encounters challenges in both training and retaining skilled staff. This shortage contributes to delays in diagnosis and treatment, with women in rural areas particularly disadvantaged.

Moreover, in Namibia, cervical cancer prevention is not comprehensively integrated into the undergraduate curricula of nurses, doctors, or allied health professionals. While general modules in public health, reproductive health, as well as community health may cover cervical cancer superficially, detailed training on screening methods such as visual inspection with acetic acid (VIA), Pap smears, or HPV DNA testing is often absent (MoHSS, 2019). As a result, numerous new graduates enter the workforce without hands-on competencies in cervical cancer prevention. Furthermore, most practical training in cervical cancer prevention in Namibia occurs through in-service training, often supported by the Ministry of Health and Social Services in collaboration with development partners, such as the WHO, UNFPA, and CDC. Nurses and midwives are the primary cadres trained in VIA and cryotherapy, with short courses delivered through workshops or targeted capacity-building initiatives (WHO, 2021). For doctors, cancer management training is generally limited to postgraduate or specialised professional development. Compared to countries such as Rwanda and Zambia, where VIA and HPV testing have been integrated into midwifery and nursing curricula, Namibia still relies heavily on external workshops and donor-driven in-

service training. Consequently, this creates challenges in terms of sustainability, consistency, as well as the equitable distribution of trained providers, particularly in rural regions. Critics argue that failure to embed cervical cancer prevention in undergraduate curricula contributes to gaps in service delivery and over-reliance on donor-funded training initiatives. To ensure a competent and motivated health workforce, addressing workforce challenges requires a complex approach, including training, retention strategies, equitable distribution, as well as continuous professional development.

2.8.3. Health Information Systems

Health information systems (HIS) involve systematic collection, analysis, as well as dissemination of health data to support evidence-based decision-making. Moreover, WHO recommends that HIS provide reliable, timely, and disaggregated data to monitor health trends, track programme performance, and guide policy (WHO, 2007). A functional HIS is particularly critical for cancer prevention, as accurate registries enable governments to monitor incidence, assess the coverage of interventions, as well as allocate resources effectively.

Moreover, in numerous African countries, however, weak cancer registries and poor record-keeping systems result in significant underreporting as well as an incomplete understanding of the cervical cancer burden. For example, studies from Cameroon and Zimbabwe revealed that cancer registries often cover only urban areas and lack consistent funding, thereby limiting their ability to capture population-level data (Petersen et al., 2022; Ndejjo et al., 2017). In Malawi, inadequate reporting mechanisms and paper-based systems have been reported to compromise the reliability of national cancer statistics, which in turn weakens planning and evaluation of prevention strategies (Maseko et al., 2015). Conversely, high-income countries have established robust, population-based registries such as SEER in the United States and the UK's National Cancer Registration and Analysis Service (NCRAS), which provide high-quality, near real-time data employed to monitor trends, evaluate programmes, as well as guide research (Bray & Parkin, 2016).

Namibia maintains a cancer registry managed by the Cancer Association of Namibia (CAN) in collaboration with the Ministry of Health and Social Services. While the registry provides valuable insights into national cancer trends, coverage is incomplete, and reporting delays reduce its utility for real-time decision-making (CAN, 2020). Furthermore, data is not fully integrated into the national health information system, limiting linkages with reproductive health and screening programme records (MoHSS, 2019). This siloed approach contrasts with integrated HIS platforms in countries like Rwanda, where cervical cancer screening data are captured within the national health database, improving coordination and responsiveness (Binagwaho et al., 2018).

Furthermore, critics argue that donor-driven reporting systems in Namibia, particularly for HIV, have contributed to fragmentation, with parallel databases that rarely communicate with cancer registries or SRH data systems (Sharma et al., 2017). This fragmentation reduces efficiency and leads to missed opportunities for integrated analysis. Compared to high-income countries, Namibia encounters persistent challenges of funding, skilled personnel for cancer data management, and consistent data quality audits. These weaknesses undermine planning, hinder monitoring of HPV vaccination and screening coverage, as

well as ultimately weaken the country's ability to achieve the WHO's 2030 cervical cancer elimination targets.

2.8.4. Health Financing

Health financing involves mobilisation, allocation, and management of financial resources to ensure that populations have access to essential health services without suffering financial hardship. Furthermore, WHO recommends that financing systems should be sustainable, equitable, as well as protective against catastrophic out-of-pocket expenditures (WHO, 2007). Adequate financing is significant for cervical cancer prevention, which requires sustained investments in HPV vaccination, screening, treatment, and palliative care.

It is imperative to note that in many LMICs, health financing remains heavily donor-dependent, particularly for HIV and infectious diseases, while reproductive cancers are systematically underfunded (Sharma et al., 2017). For example, Zambia, Congo DRC, and Malawi relied extensively on external support to finance cervical cancer screening and HPV vaccination, with programme continuity often threatened when donor funds fluctuate (Chidyaonga-Maseko et al., 2015; Binagwaho et al., 2013). Conversely, high-income countries finance cervical cancer prevention through universal health coverage (UHC) schemes, ensuring that HPV vaccination and Pap smear screening are provided at little or no direct cost to individuals (Bray & Parkin, 2016). These financing structures contribute to much higher coverage rates and earlier detection compared to LMICs.

In Namibia, health services are heavily subsidised, with most Namibians paying less than NAD 8 per consultation (MoHSS, 2020). Furthermore, this suggests a financing system that provides strong financial protection at the point of service. However, a key limitation is that these figures obscure the indirect costs borne by women seeking care, such as transportation, childcare, and lost wages. For women working in informal or subsistence economies, these indirect costs often represent the primary impediment to accessing cervical cancer screening.

Compared to countries like Rwanda, which has successfully integrated cervical cancer screening into its UHC package through government-financed health insurance (Binagwaho et al., 2013), Namibia has yet to establish cervical cancer prevention as a systematically funded, high-priority service. Moreover, financing gaps are further exacerbated by vertical donor funding, which has historically prioritised HIV services, rendering cervical cancer prevention reliant on fragmented or project-based support. Critics argue that this creates inequities, as women can access subsidised HIV care however must still overcome logistical as well as financial obstacles to access cancer screening and treatment (Sharma et al., 2017).

2.8.5. Access to vaccines, medicinal products, and infrastructure

Access to essential medicines and technologies refers to the availability of vaccines, diagnostic instruments, and treatment interventions required to deliver adequate healthcare. Moreover, WHO recommends that these technologies be consistently available, affordable, and of assured quality across all levels of the health system (WHO, 2007). For cervical cancer, this includes HPV vaccines, screening

instruments such as Pap smears, VIA, HPV DNA tests, as well as treatment technologies including cryotherapy, loop electrosurgical excision procedure (LEEP), and radiotherapy.

Globally, the availability of these technologies is highly uneven. In high-income countries, HPV vaccination is included in national immunisation schedules, and diagnostic tests, such as HPV DNA testing, are routine, enabling early detection and treatment (Bray & Parkin, 2016). More importantly, this has led to significant reductions in cervical cancer incidence in countries such as Australia and the United Kingdom, where organised screening and vaccination programmes are supported by well-resourced systems (Garland et al., 2018). In contrast, many LMICs encounter challenges such as supply chain disruptions, stockouts of essential screening materials, as well as limited access to treatment equipment, particularly in rural areas (Bruni et al., 2019). For instance, studies in South Africa and Malawi report frequent shortages of acetic acid and cryotherapy machines, mandating women to delay or forgo treatment (Malakoane et al., 2020; Maseko et al., 2015b)

In Namibia, HPV vaccines were rolled out nationally in 2025, marking a significant achievement in prevention (MoHSS, 2025). However, access to diagnostic instruments such as HPV DNA testing remains limited, with most facilities relying on Pap smears or VIA. Moreover, treatment technologies, such as cryotherapy and LEEP, are primarily concentrated in tertiary hospitals, rendering rural areas underserved (CAN, 2020). Compared to Rwanda, which has successfully expanded HPV vaccination nationwide and decentralised screening and treatment into district hospitals (Binagwaho et al., 2013), Namibia encounters challenges in equitable distribution and maintenance of essential equipment.

Furthermore, critics argue that the reliance on donor support for HPV vaccines raises concerns about long-term sustainability, as programme continuity may be at risk if funding priorities shift (Sharma et al., 2017). Moreover, while Namibia has adopted some WHO-recommended technologies, gaps in maintenance, training, as well as infrastructure impede consistent delivery. It is imperative to note that women in rural communities encounter the double burden of travelling long distances to reach facilities and then encountering unavailable equipment or untrained staff upon arrival. This disconnect between policy commitments and practical realities underscores the need for stronger supply chain systems, investment in decentralised infrastructure, as well as integration of technologies into primary health care settings

2.9.6. Leadership and governance

Leadership in health systems refers to the ability to provide vision, direction, and influence that mobilise people and resources towards achieving health goals. Moreover, it involves setting priorities, guiding decision-making, as well as inspiring collective action (WHO, 2007). Governance, on the other hand, encompasses the structures, rules, and processes through which decisions are made, implemented, as well as monitored within the health sector. It includes accountability, transparency, participation, as well as coordination among stakeholders to ensure that policies and programmes are effectively delivered (WHO, 2007). In the context of cervical cancer prevention, leadership and governance are critical for ensuring that national strategies prioritise HPV vaccination, screening, and treatment, that resources are equitably allocated, moreover that stakeholders work in a coordinated manner towards elimination targets.

Effective leadership and governance are imperative for coordinating cervical cancer prevention efforts. In Malawi, limited coordination among partners and inadequate sensitisation of stakeholders have negatively impacted programme implementation (Maseko et al., 2015). Furthermore, Tanzania's national cervical cancer stakeholders' forum outlines the importance of collaboration among various ministries and organisations to drive the elimination agenda (Mugassa & Frumence, 2020). Moreover, effective leadership in cervical cancer prevention requires government commitment to prioritise cervical cancer within national health strategies, mobilise resources, as well as establish clear accountability mechanisms at all levels. Strong leadership also entails advocacy to reduce stigma, integration of cervical cancer services into primary healthcare, as well as fostering multi-sectoral collaboration with education, finance, and community-based organisations. While some countries have developed strong policy guidance and effective stakeholder engagement, others still lack clear strategies and coordination mechanisms, resulting in fragmented efforts. Furthermore, the absence of systematic implementation and monitoring frameworks undermines the effectiveness of prevention programmes, while limited human resources at the central level compromise oversight and support. Strengthening leadership and governance, therefore, involves not only developing comprehensive policies however also ensuring political will, sustainable financing, inter-sectoral coordination, as well as capacity-building to achieve effective and equitable cervical cancer prevention.

2.9. Community-based interventions in cervical cancer prevention

Cervical cancer remains a significant public health challenge in LMICs, where health systems are often constrained by limited infrastructure and resources. Facility-based approaches to screening and prevention frequently fail to reach women in remote or underserved areas (Habila et al., 2021a). In this regard, community-based interventions have emerged as a critical strategy to bridge service gaps by delivering education, preventive services, as well as early detection directly within communities. Furthermore, community-based approaches are strategies that engage individuals, households, and local organisations directly in health promotion, prevention, and care delivery within their own communities. They are critical for cervical cancer prevention in LMICs because they address impediments that limit access to facility-based services, such as geographical distance, cost, stigma, and lack of awareness (Habila et al., 2021a). By extending services into communities through health education, outreach, and self-sampling, these approaches promote prevention, early detection, and timely linkage to care.

A central element of community-based approaches is local ownership, which refers to the active involvement of community members in designing, implementing, and sustaining health programmes. Moreover, ownership is demonstrated when communities participate in decision-making, mobilise local resources, and champion prevention activities. For example, when women's groups, faith-based organisations, and local leaders are empowered to disseminate information and support screening initiatives, programmes are more acceptable and sustainable (Campbell & Cornish, 2018). Furthermore, community-based interventions also influence social networks and community structures, such as family ties, peer groups, churches, schools, and traditional authorities, which shape health behaviours and influence trust in health interventions. Literature indicates that tapping into these networks increases uptake of cervical cancer services by reducing stigma, enhancing credibility of messages, as well as

normalising preventive practices (Glanz et al., 2015; Karanja-Chege, 2022). For instance, in Zimbabwe, women who received HPV self-sampling kits from community health workers were significantly more likely to participate in screening compared to those invited to clinics, demonstrating how trusted local structures can overcome structural and psychosocial impediments (Isabirye et al., 2022). Similarly, in Uganda, community mobilisation through village health teams has been observed to improve cervical cancer awareness and uptake of screening services (Ndejjo et al., 2017).

Similar strategies in other countries, such as Ethiopia and Iran, have also incorporated mobile outreach as well as visual inspection with acetic acid (VIA) to enable treatment on the same day, which is both cost-effective and culturally acceptable (Ruddies et al., 2020; Taghizadeh Asl et al., 2020). Furthermore, these strategies reduced delays in the continuum of care as well as leveraged existing trust in peer educators and lay health workers within local communities. Conversely, community-based interventions that heavily relied on facility referrals (without transport solutions and a follow-up process post-referral) yielded poorer outcomes, particularly in geographically remote and resource-constrained settings (Moodley et al., 2019). These differences also indicate the need for integrated, flexible and culturally informed designs to achieve improved outcomes.

Despite numerous community-based programmes reporting improved screening uptake, fewer publications provide evidence of long-term data about cervical cancer incidence or mortality reductions. For example, a Zambian study reported improved VIA coverage after community campaigns; however, challenges of adherence with treatment and follow-up are inadequately reported (Nyambe et al., 2018). Importantly, the common challenge of inadequate monitoring and evaluation mechanisms and frameworks is assessing sustained impact, scaling up, and equitable outcomes. Moreover, donors fund numerous interventions, however, do not generally keep the momentum after funding ends. There is a growing impetus for governments to adjust these models and systematically incorporate them into national policy frameworks through sustainable financial resources as well as ongoing capacity building.

Furthermore, NGOs, civil society organisations, and local health committees have fullfilled a crucial function in rural and underserved communities. In Rwanda, the strong collaboration of NGOs, the Ministry of Health, and community leaders enabled the inclusion of HPV vaccination into the routine school health programme, resulting in more than 90% coverage in the target population aged 10-14 years (Binagwaho et al., 2019). Moreover, in Mozambique and Uganda, civil society organisations initiated cervical cancer advocacy, trained community health volunteers, and implemented mobile outreach clinics to engage women with limited mobility or health literacy (Ncube et al., 2015). These actions demonstrate the importance of multi-sectoral actions to achieve coverage and acceptability. In Namibia, community-based models are not fully implemented in the context of cervical cancer prevention. Health extension workers (HEWs) fullfill a crucial function in health promotion; however, they often receive limited cancer-specific education and follow-up, as well as their involvement is poorly documented. As observed in other similar socio-economic countries, it is logical to create and institutionalise a community-based prevention model in Namibia. More importantly, this model can connect national policy and community context, particularly in remote rural areas of Namibia, such as Ohangwena and Kavango West, where cultural norms and access influence health-seeking behaviour.

2.10. Gaps in literature

The review of existing evidence revealed several imperative gaps that are directly relevant to cervical cancer prevention in rural Namibia, particularly in Ohangwena and Kavango West. Although global and regional research indicate the high burden of cervical cancer and the effectiveness of screening and HPV vaccination (Bruni et al., 2021; WHO, 2020), far less is known about how rural communities in northern Namibia understand and respond to cervical cancer prevention services. This gap limits the development of prevention strategies that reflect the lived realities of women in remote settings.

Furthermore, while KAP studies have been conducted in several African countries (Mlange et al., 2018; Mwaka et al., 2020; Tugume et al., 2021), in Namibia, available research mainly reports screening coverage or national statistics, with minimal information on what community members in regions like Ohangwena and Kavango West actually know about cervical cancer, how they feel about screening, or how frequently they engage in preventive practices. There is also limited evidence on how knowledge interacts with attitudes and practices in settings where cultural beliefs, limited health literacy, as well as socio-economic constraints strongly influence health behaviour. This creates a clear gap in understanding the behavioural foundations of cervical cancer prevention in rural northern Namibia.

Moreover, studies across sub-Saharan Africa have described common impediments such as fear, cost, distance, and stigma (Abrahams et al., 2019; Mwaka et al., 2015), however few have explored how women make decisions in cultural contexts where health choices are influenced by partners, family elders, religious beliefs, and community norms. In Namibia, there is a paucity of qualitative evidence on health-seeking behaviour specific to cervical cancer. However, existing studies do not fully explain how women negotiate conflicting information, how cultural expectations shape screening decisions, or how household dynamics either support or impede preventive behaviour. This gap is significant because prevention is not just an individual choice; social influence also fullfills a significant function. Without understanding these deeper behavioural processes, community-based prevention strategies may overlook the social realities that shape decision-making.

Although national documents outline challenges such as limited VIA coverage, shortages of trained staff, and inconsistent availability of supplies (MoHSS, 2018), there is a lack of empirical research on how these challenges are experienced in rural facilities, which are at the frontline of service delivery. Moreover, studies in other African settings report weak referral systems, poor follow-up, as well as limited integration of screening with routine services (Katangolo et al., 2022; Chidyaonga-Maseko et al., 2015), however few studies have examined these challenges within Namibia's primary healthcare system, particularly in hard-to-reach areas such as Ohangwena and Kavango West. There is also limited evidence on how national cervical cancer guidelines are implemented in resource-constrained districts and clinic settings, or how health system constraints interact with community-level impediments to influence uptake.

Moreover, the most significant gap across the literature is the lack of integrated models that bring together community KAP, women's behavioural experiences, and health system challenges. Existing studies typically focus on single components, either knowledge levels or service barriers, without

connecting these elements into a unified framework. As a result, there is limited guidance on how to design prevention approaches that are both appropriate and feasible within the constraints of rural Namibian health systems. More importantly, no existing model incorporates the combined perspectives of community members, women navigating prevention decisions, and healthcare workers delivering services. This gap directly justifies the need for developing a new community-based prevention model for cervical cancer management in Ohangwena and Kavango West. If these gaps are addressed, this study provides a comprehensive, multi-level understanding of cervical cancer prevention in rural Namibia. Equally important, the findings contribute to the local evidence base, which currently lacks studies, moreover, offer practical, community-grounded solutions for enhancing screening uptake as well as sustaining cervical cancer prevention efforts in rural regions.

2.11. Theoretical frameworks

The study is underpinned by three complementary theoretical frameworks, each corresponding to a specific objective. These are the Health Belief Model (HBM) for Objective 1, the Socioecological Model of Health Behaviours for Objective 2, and the WHO Health Systems Framework for Objective 3. Each framework offers distinct conceptual insights into the individual, social, and systemic determinants of cervical cancer prevention. Moreover, their integration allows a holistic approach that reflects the complex realities of rural Namibia as well as guides the development of a community-based prevention model.

2.11.1. Health Belief Model (HBM)

The Health Belief Model (Figure 2.2) explains why people decide to participate in preventive behaviours, such as cervical cancer screening or HPV vaccination. It is based on the concept that individuals make health decisions by weighing their understanding of risk, the severity of the disease, the benefits of acting, and the barriers that might stop them.

Furthermore, HBM is closely aligned with Objective 1, which examines community knowledge, attitudes, and practices. The KAP components link directly to the main components of the model. Knowledge of cervical cancer and HPV shapes how people perceive their susceptibility and severity. For example, if women do not understand that HPV causes cervical cancer, they may not perceive themselves being at risk. Moreover, attitudes correspond to beliefs about benefits (such as early detection through screening) and impediments (such as fear, embarrassment, or partner disapproval). Practices are influenced by self-efficacy, meaning how confident women feel in their ability to seek screening, travel to a clinic, or act on health information. Finally, cues to action, such as health talks, radio programs, or advice from friends, explain why some women act on prevention messages while others do not. More importantly, these connections demonstrate how the HBM explains the patterns seen in the KAP results. It clarifies why some women with good knowledge still avoid screening, why fears and misconceptions shape attitudes, moreover why practical impediments reduce preventive practices. The model also underscores the importance of confidence, access, and clear health messages in motivating action. This renders HBM a suitable framework for interpreting the knowledge, attitudes, and practices explored in Objective 1.

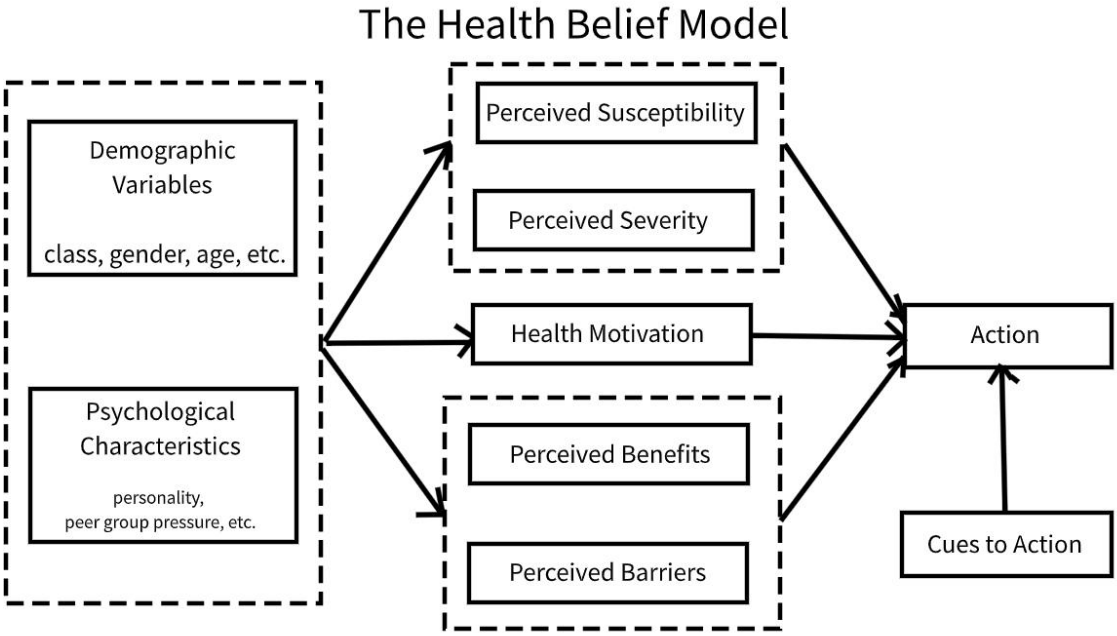


Figure 2.2: The Health Belief Model

Source: Rosenstock (1974).

2.11.2. Socio-Ecological Model (SEM)

The Socio-ecological Model (figure 2.3) explains health behaviour by recognising that people do not make decisions in isolation. Instead, their actions are shaped by several layers of influence, including personal beliefs, family and partner dynamics, community norms, as well as the broader healthcare system environment. Moreover, the model postulates that behaviour is the result of interactions between individual, social, cultural, and structural factors.

The SEM is highly relevant to Objective 2, which examines how women's health-seeking behaviour is influenced by their social and cultural environment. Furthermore, at the individual level, personal beliefs, fears, and knowledge affect whether a woman feels ready to seek screening. At the interpersonal level, partners, family members, and peers can either encourage or discourage screening through approval, control, or shared experiences. At the community level, cultural expectations, stigma, traditional beliefs, and social norms shape how cervical cancer is understood and discussed. At the institutional and structural level, the quality of services, distance to facilities, treatment by health workers, as well as reliability of outreach programmes influence how easily women can act on their intentions. Moreover, this framework explains why several women intend to seek care however still delay, why partner support matters, as well as why cultural expectations can limit autonomy. It also shows how structural barriers interact with social pressures to affect health-seeking behaviour. These insights render the SEM well-suited for interpreting the behavioural and socio-cultural findings addressed in Objective 2.

The socio-ecological model is presented in five levels: individual, interpersonal, community, organisational, and policy, each contributing uniquely to health-seeking behaviour.

1) **Individual Level**

At the individual level, the focus is on a woman's personal characteristics, her knowledge, attitudes, beliefs, age, education, past experiences, and perception of risk. In this study, this level includes women's understanding of cervical cancer, awareness of prevention methods, as well as confidence in their ability to seek services. Moreover, numerous women in rural Namibia have limited information about screening or may associate cervical cancer with stigma or infertility. These personal perceptions influence whether they take the initiative to visit a clinic or ignore symptoms. Interventions at this level, therefore, focus on enhancing knowledge, fostering self-efficacy, as well as addressing misconceptions through targeted educational interventions.

2) **Interpersonal Level**

The interpersonal level refers to the influence of relationships with family, friends, partners, and peers. Moreover, in numerous Namibian communities, women's decisions about reproductive health are strongly affected by their spouses or family members. For instance, some women require their husband's approval before seeking screening or may feel embarrassed to discuss reproductive issues. Supportive partners, peers, or relatives can, however, act as motivators who encourage individuals to screen and vaccinate. This study examines how interpersonal communication, social support, and shared beliefs influence women's health-seeking behaviour. Strengthening this layer involves engaging men, families, and peer groups in health education to foster supportive environments.

3) **Community Level**

The community level represents cultural norms, traditions, and shared beliefs that influence behaviour. In rural Namibia, community perceptions about cancer, sexuality, as well as reproductive health often dictate what is considered acceptable. For example, myths that cervical cancer is caused by promiscuity or witchcraft can prevent women from seeking care. Moreover, social stigma surrounding gynaecological examinations can also discourage participation. Community leaders, religious figures, and women's groups fullfil an imperative function in either reinforcing or challenging these norms. This study, therefore, examines how community attitudes and cultural values shape women's willingness to engage in preventive services. Culturally sensitive health promotion campaigns and community dialogues could enable shift harmful norms, moreover create supportive environments for screening and vaccination.

4) **Organisational / Health System Level**

The organisational level focuses on the structures, resources, and service delivery systems that determine how easily women can access preventive care. Moreover, in the study regions, long distances to clinics, a lack of transportation, stockouts of screening materials, a shortage of trained female health workers, as well as irregular outreach services all influence health-seeking behaviour. When services are accessible, welcoming, and reliable, women are more likely to seek care. However, when health facilities are under-resourced or perceived as unfriendly, even well-informed women may delay screening. This study

examines these health system factors to underscore the importance of enhancing service delivery, training healthcare workers in respectful communication, as well as improving logistical support for rural outreach.

5) Policy / Societal Level

At the policy level, broader frameworks such as national health policies, cervical cancer prevention strategies, as well as government funding priorities shape individual and community behaviour. Moreover, Namibia's National Policy on Cervical Cancer Prevention (2018) and the National Multisectoral Strategic Plan for Non-Communicable Diseases (2017/18–2021/22) provide the basis for screening and HPV vaccination. However, implementation remains inconsistent, particularly in rural regions. Policy-level impediments such as delayed procurement of HPV vaccines, limited monitoring systems, as well as uneven resource allocation affect the reach and sustainability of prevention programmes. This study therefore, considers how national guidelines as well as political commitment influence the local health system and women's access to preventive care.

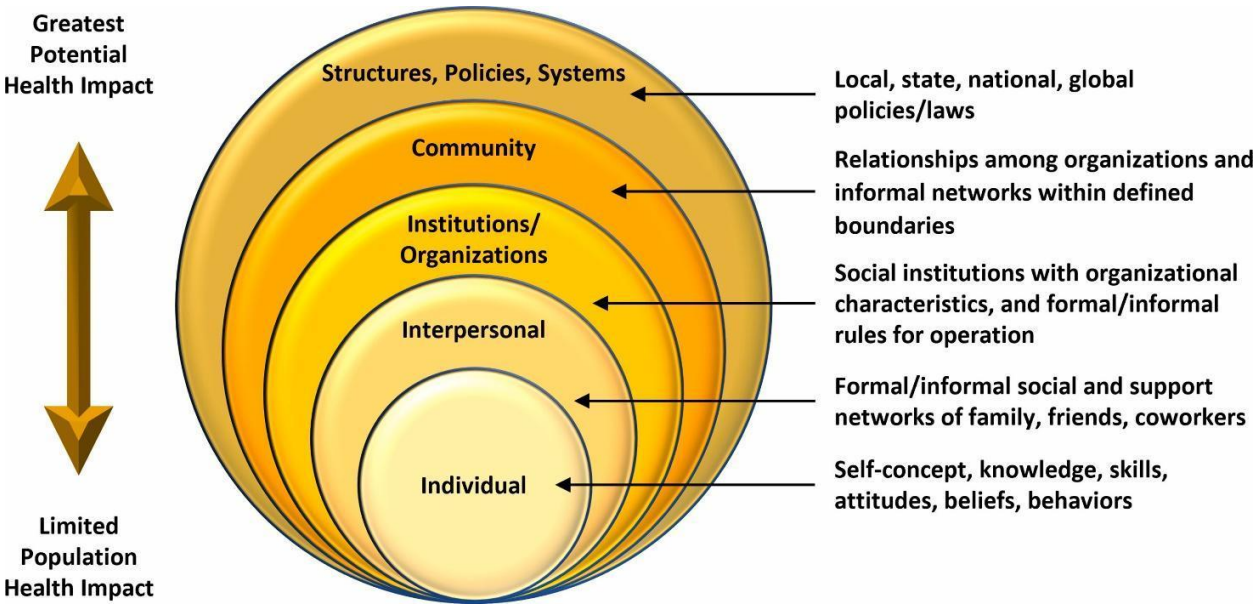


Figure 2.3: The Socio-Ecological Model (SEM)

Source: McLeroy et al., (1988).

2.11.3. WHO Health System Building Blocks Framework

The World Health Organisation's Health System Building Blocks Framework (Figure 2.4.) describes the core components required for a strong and functioning health system. Moreover, it includes six elements: service delivery, health workforce, health information systems, access to essential medicines and equipment, financing, and leadership/governance. More importantly, the framework is designed to identify where systems are functioning effectively, moreover where gaps may compromise the delivery of health services.

This framework aligns closely with Objective 3, which focuses on comprehending the health-system challenges that affect the delivery and uptake of cervical cancer prevention services in Ohangwena and Kavango West. Furthermore, the service delivery component assesses whether screening, HPV vaccination, and outreach programmes are consistently available. The health workforce block underscores challenges such as shortages of trained staff, high workloads, as well as uneven distribution of providers. Health information systems identify challenges with record-keeping, follow-up, and reporting. In addition, the access to essential medicines and equipment component relates to shortages of screening supplies, functioning lamps, or HPV vaccines. The financing block addresses how limited or unstable funding affects service continuity. Finally, leadership and governance interpret gaps in coordination, policy implementation, as well as supervision within prevention programmes. These components illustrate how systemic weaknesses can impede access to screening, prolong follow-up, as well as diminish the efficacy of national prevention efforts. Importantly, this renders the framework well suited for analysing the structural impediments explored in Objective 3.

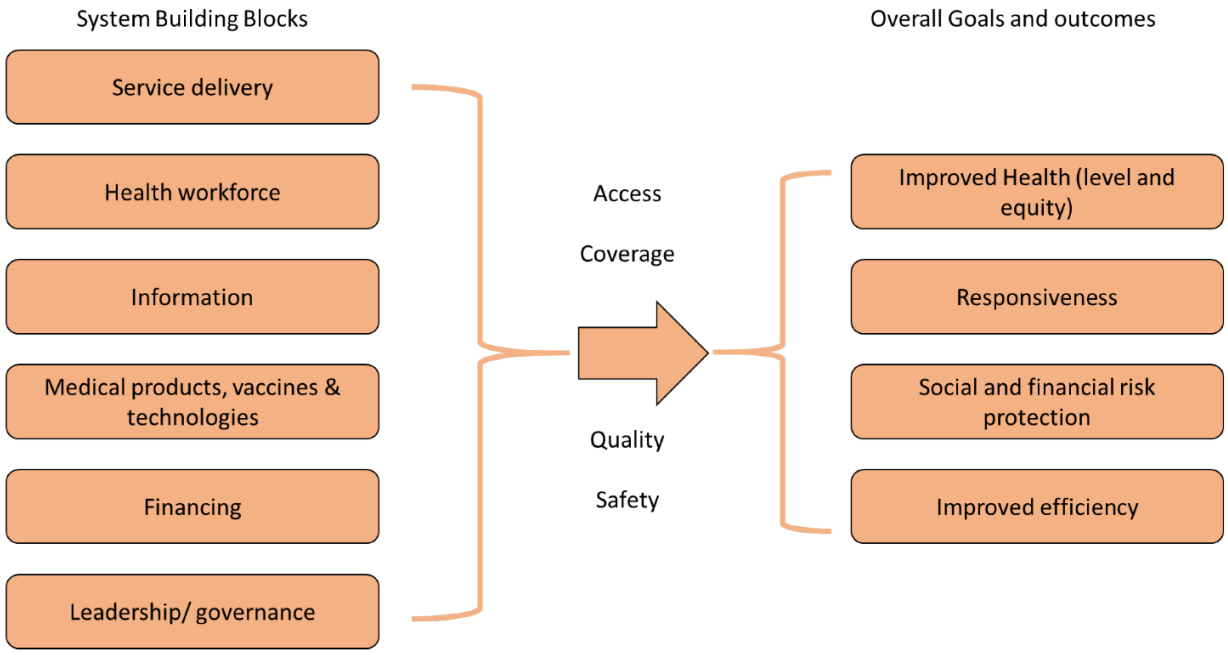


Figure 2.4: WHO's health system framework

Source: (WHO, 2007).

2.12. Summary

The literature underscored that cervical cancer prevention requires a multi-level approach, encompassing primary, secondary, and tertiary strategies. However, gaps remain due to limited awareness, cultural barriers, as well as health system constraints, particularly in rural Namibia. Moreover, the socioecological model provides valuable frameworks for understanding both individual perceptions and broader contextual influences on prevention behaviour. These gaps and theoretical insights underscore the need for this study to develop a community-based model tailored to the realities of the Ohangwena and

Kavango West regions. The next chapter outlines the methodology employed to investigate these issues as well as guides the development of the proposed model.

CHAPTER 3: METHODOLOGY

3.1. Introduction

In this chapter, the research methodology employed in developing a community-based prevention management model for cervical cancer in the Ohangwena and Kavango West regions of Namibia is described. Furthermore, the chapter outlines the overall research design, the approaches employed, the study population, the sampling techniques adopted, as well as the data collection and analysis methods employed in this study. It also describes the strategies undertaken in the interests of trustworthiness and ethical and methodical rigour. This selected method is appropriate for the three general aims of the study: namely, assessing the knowledge, attitudes, and practices acquired by the community regarding cervical cancer prevention, examining the health-seeking behaviour of women, moreover, identifying health system constraints that impede cervical cancer prevention in rural Namibia. Equally important, the study employed a mixed-methods strategy, combining quantitative and qualitative designs, which affords an in-depth understanding of the phenomenon being researched.

3.2. Research design

Research design is the plan that guides how a study is conducted, ensuring the research problem is addressed in a systematic and credible way (Creswell & Creswell, 2022). This study applied a sequential explanatory mixed methods design to address the objectives in a structured manner and to develop a well-rounded understanding of cervical cancer prevention in the Ohangwena and Kavango West regions of Namibia.

This approach was chosen because cervical cancer prevention in rural settings is complex and operates at multiple levels. It involves measurable individual factors such as knowledge, attitudes, and practices, but it is also shaped by social norms, cultural beliefs, and limitations within the health system. A purely quantitative study would have identified patterns and associations but would not have clarified why those patterns exist. On the other hand, a purely qualitative study would have generated rich insights without showing the scale and distribution of key issues such as screening uptake and knowledge gaps.

In this design, the quantitative phase came first. It collected numerical data on community knowledge, attitudes, and practices related to cervical cancer prevention. This phase determined the prevalence of knowledge levels, screening behaviour, and key predictors of these outcomes. The findings highlighted specific areas that required deeper investigation.

The study then moved to two qualitative phases. These explored women's health-seeking behaviour and health system challenges in more detail. Because the qualitative work was informed by the earlier statistical results, it directly examined the gaps and trends identified in the first phase. For example, low screening uptake and identified knowledge deficits shaped the development of interview guides and discussion prompts.

Bringing these phases together strengthened the explanatory power of the study. The qualitative findings helped interpret and contextualise the quantitative results, while the quantitative data provided scope and structure. This integration ensured that the final prevention model was grounded in both measurable

evidence and lived experiences. As a result, the methodological approach supported the development of empirically derived constructs and relationships necessary for theory-informed model development.

3.3. Study setting

3.3.1. Namibia

Namibia is a southern African country bordered by Angola, Zambia, Botswana, and South Africa, with the Atlantic Ocean forming its western coastline. Moreover, the country has a population of approximately three million people and remains one of the most sparsely populated nations in the world due to its vast land area and arid geography. Namibia was recently reclassified as a lower-middle-income country (LMIC), although significant socio-economic inequalities persist across regions. Furthermore, the population is diverse, consisting of multiple ethnic and linguistic groups, each with distinct cultural norms that influence health behaviours and community engagement. Administratively, Namibia is divided into 14 regions, which vary widely in infrastructure, population distribution, as well as access to essential services.

In addition, the Namibian health system operates through a decentralised structure, with primary healthcare serving as the main entry point for most citizens. While the public healthcare system is the main provider of services, disparities between urban and rural areas remain significant. Furthermore, urban centres such as Windhoek and Oshakati generally have well-equipped facilities, more specialised personnel, and higher service coverage. Conversely, rural regions encounter persistent challenges, including shortages of trained health workers, long travel distances to health facilities, limited diagnostic services, as well as inconsistent outreach. These barriers particularly affect preventive programmes such as cervical cancer screening, HPV vaccination, as well as community health education.

Moreover, Namibia continues to encounter a growing burden of non-communicable diseases, including cervical cancer, which is the second most common cancer among women nationally. Despite national initiatives to enhance prevention through HPV vaccination and VIA screening, coverage remains uneven, particularly in rural communities where geographical, structural, and socio-cultural constraints impede service uptake. Understanding this national context is imperative for interpreting the findings of this study, as it underscores how broader health system limitations, population distribution, as well as social inequalities influence women's access to cervical cancer prevention services. Figure 3.1 illustrates the Namibian Map.

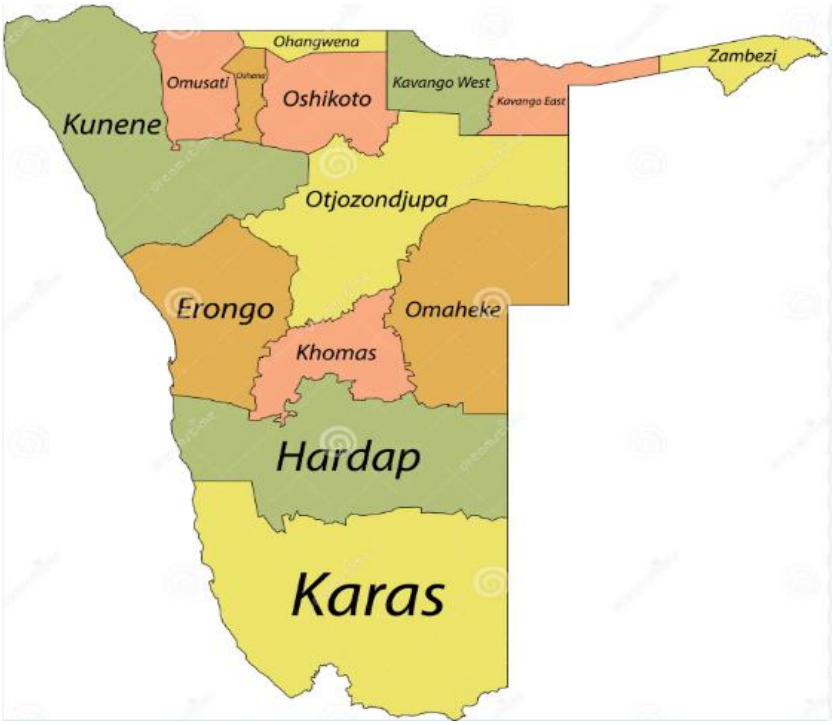


Figure 3.1: Administrative map of Namibia.

Source: FAO/SADC (1997) and adapted via Nations Online (2017).

3.3.2. Ohangwena region

The Ohangwena Region, located in northern Namibia along the Angolan border, is one of the most densely populated regions in the country, with a population of 337,729 people according to the 2023 Census (Namibia Statistics Agency, 2023). Despite its size and population demands, the region's health infrastructure remains limited. Moreover, Ohangwena is divided into twelve constituencies and is served by three district hospitals, Engela, Eenhana and Okongo, alongside several health centres and clinics that often operate with staff and resource shortages (Ministry of Health and Social Services, 2022). Engela District Hospital, situated close to the border, experiences an additional service burden because many Angolan nationals cross into Namibia to seek care, including maternal, child health and emergency services, which increases patient load and strains already limited resources (MoHSS, 2022; World Health Organisation, 2021).

In addition, the region is predominantly rural, with most households relying on subsistence farming, high poverty levels, long travel distances to facilities as well as poor road networks, all of which impede timely access to preventive health services (NSA, 2023). Ohangwena also carries a high HIV prevalence, a known co-factor for cervical cancer progression (UNAIDS, 2023). These combined variables rendered the region an appropriate and strategic selection for this study, as it represents a high need, high burden setting where gaps in cervical cancer prevention are likely to be most visible, moreover where community, behavioural and health system challenges intersect more intensely compared to other regions.

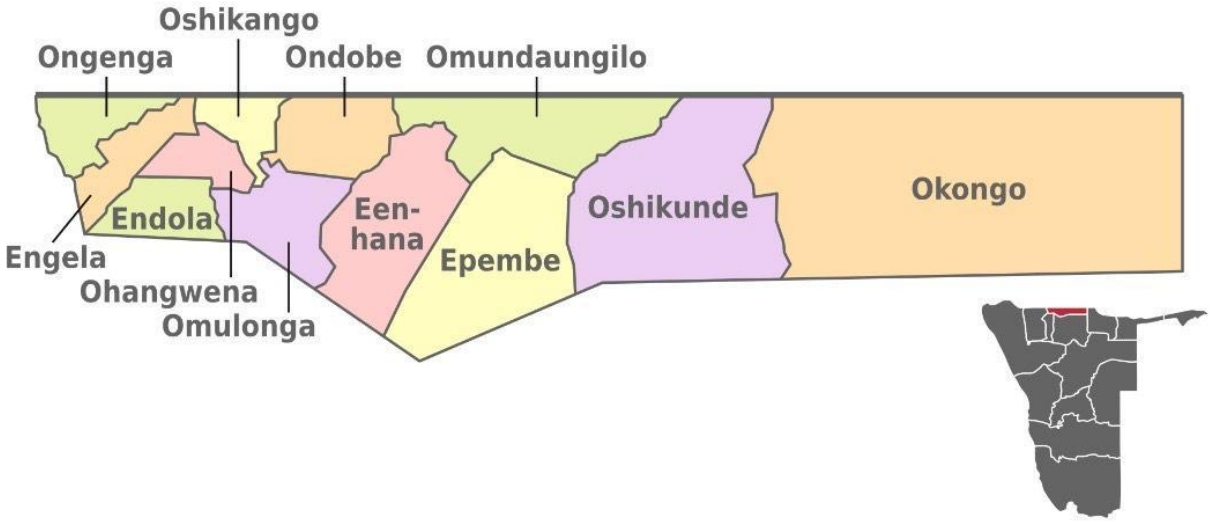


Figure 3.2: Map of the Ohangwena Region showing all constituencies.

Source: (geoBoundaries, 2022)

3.3.3. Kavango West region

The Kavango West Region, located in the northeastern part of Namibia, is one of the least developed regions in terms of infrastructure and healthcare delivery. According to the 2023 Census, the region has a population of 123,266 people, accounting for 4.1% of Namibia's total population (Namibia Statistics Agency, 2023). Moreover, Kavango West is characterised by widely scattered rural settlements, high poverty levels, as well as limited access to health facilities, which makes service delivery challenging.

The region is divided into eight constituencies, with Nankudu District Hospital serving as the main referral hospital, supported by a limited number of health centres and clinics (Ministry of Health and Social Services, 2022). Many of these facilities experience frequent shortages of essential medical supplies and personnel, further limiting the availability of preventive and curative services. Furthermore, the region also has a high burden of HIV infection, which increases women's susceptibility to cervical cancer progression (UNAIDS, 2023). Preventive services such as HPV vaccination and cervical cancer screening via visual inspection with acetic acid (VIA) or Pap smear are not consistently available across primary healthcare levels, often resulting in delayed diagnosis and poor outcomes (MoHSS, 2022; World Health Organisation, 2021).

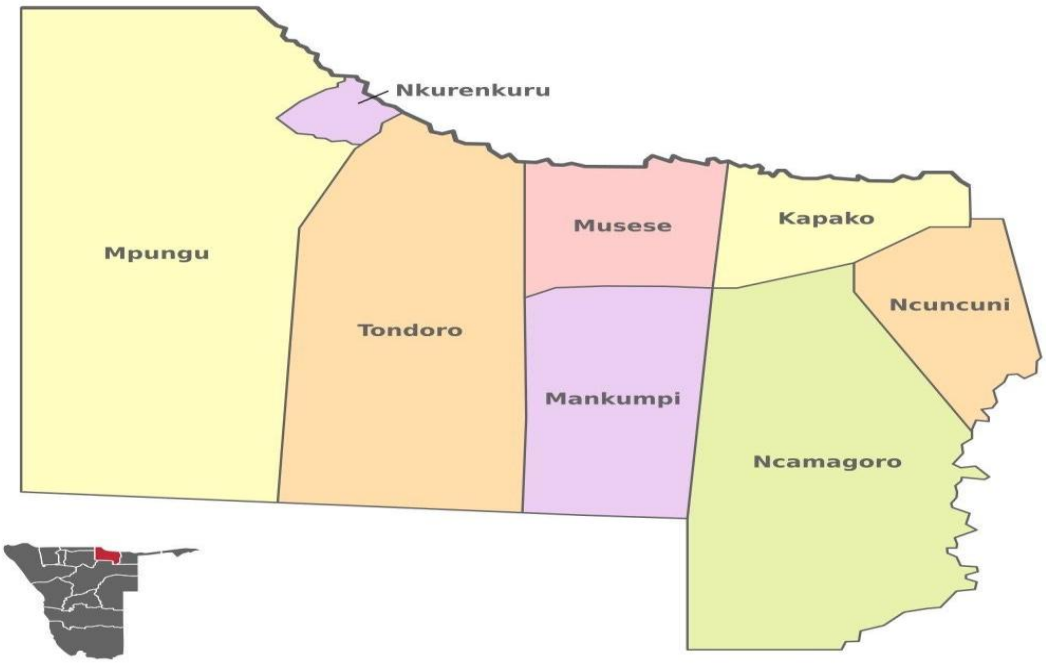


Figure 3.3: Map of the Kavango West Region showing all constituencies.

Source: (geoBoundaries, 2022)

3.4. Study population

This study focused on groups whose experiences, decisions, and roles influence cervical cancer prevention within the Ohangwena and Kavango West regions of Namibia. Although formal cervical cancer prevention programmes are limited in these regions, the perspectives of community members, women of reproductive age, as well as healthcare workers remain central to understanding how prevention currently occurs in practice. The study population, therefore, included adult community members aged 18 to 59 years, women aged 18 to 49 years, as well as healthcare workers linked to cervical cancer prevention activities. The upper age limit of 59 years in the quantitative phase was applied to focus on adults, most likely to influence household health decisions while maintaining emphasis on the screening-eligible population. Individuals above this age were excluded to preserve comparability across demographic groups and because national screening efforts primarily prioritise younger and middle-aged women.

Moreover, men and women at the community level were included because both contribute to awareness, decision-making, and support for women's health, particularly in rural households where family influence is strong. More importantly, women of reproductive age were prioritised because they are the primary group targeted for screening and HPV vaccination, moreover their perceptions and experiences reflect real barriers to accessing available services.

Although women older than 49 years may still require screening or follow-up depending on prior screening history, the qualitative phase focused on women within the reproductive age group because prevention services such as HPV vaccination, antenatal care, and family planning provide key entry points for community-based cervical cancer prevention. This age restriction may limit transferability of findings to older women, and this is acknowledged as a study limitation. Healthcare workers, including nurses, doctors, community health workers, and programme officers, were included to provide insight into service availability, operational challenges, as well as how national guidelines are applied in low-resource settings.

3.5. Inclusion and exclusion criteria

3.5.1. Inclusion criteria

Participants were included in the study if they met the following criteria:

1) Community members (men and women aged 18-59 years) who had lived in Ohangwena or Kavango West for at least six months and were willing to participate. Moreover, this age range ensured the inclusion of adults who are most likely to influence or participate in decisions related to women's health. The six-month residency requirement ensured that participants had meaningful exposure to local cultural norms, household dynamics, as well as health service environments relevant to cervical cancer prevention.

2) Women of reproductive age (18-49 years) who were permanent residents of the study regions and able to communicate in English or a local language (Oshikwanyama or Rukwangali). Furthermore, women were also included if they had some exposure to reproductive health services such as cervical cancer screening (VIA or Pap smear), HPV vaccination, antenatal care, or family planning consultations.

3) Healthcare workers (nurses, doctors, community health workers, and programme officers) who had worked in public health facilities or outreach programmes for at least six months. Moreover, this ensured that participants had adequate experience with reproductive health services, screening programmes, as well as community engagement activities. Their perspectives were pivotal for identifying system-level challenges, resource gaps, as well as service delivery processes that influence cervical cancer prevention.

3.5.2. Exclusion criteria

Participants were excluded if they met any of the following conditions:

1) Community members younger than 18 years or older than 59 years were excluded because the focus of the study was on adults who were either eligible for cervical cancer prevention services or fulfilled a function in health decision-making within households.

2) Women who were younger than 18 or older than 49, were not permanent residents of the study regions, or were unable to communicate in English, Oshikwanyama, or Rukwangali were excluded. Women outside the reproductive age group were not the primary targets for cervical cancer

screening and including them would not provide relevant insights into the preventive services aimed at this priority group. Similarly, non-residents and those unable to communicate in the study languages were excluded because they would not have provided reliable or meaningful experiences with local health services, which could compromise the accuracy and relevance of the findings.

3) Healthcare workers employed exclusively in private facilities were excluded because their working environments and resource constraints differed substantially from those in public rural facilities, where most cervical cancer prevention activities occurred. Including them could have introduced perspectives not aligned with the realities faced by the target population.

4) Individuals who were unwilling or unable to provide informed consent were excluded, in accordance with ethical principles that required voluntary participation and clear understanding of the study.

3.6. Sampling method and sample size

3.6.1. Phase I: KAP study

A multi-stage sampling approach was employed to ensure fair and practical representation across the two study regions. In the first stage, constituencies were selected employing the fishbowl random sampling method, a simple probability technique that ensures transparency as well as an equal chance of selection. In this process, the names of all constituencies within each region were written on identical pieces of paper, placed in a bowl, and thoroughly mixed. Three constituencies were then randomly selected from each region without replacement, resulting in a total of six constituencies. This first stage therefore employed probability sampling at the constituency level.

Moreover, the decision to select three constituencies per region was based on both methodological and logistical considerations. From a methodological perspective, three constituencies per region provided sufficient geographic and demographic diversity to represent the broader population while maintaining manageable fieldwork coverage. This number allowed for the inclusion of both densely populated as well as sparsely populated areas, capturing variations in access to health services and community KAP levels. From a logistical perspective, the selection balanced research feasibility with available time, funding, and personnel, ensuring that quality data could be collected efficiently within the constraints of the study's resources.

In the second stage, one central health facility within each selected constituency was identified as the data collection point. Furthermore, these facilities were selected because they serve as community entry points as well as provide a central location where both men and women can be reached. Moreover, community members who visited the facility on the day of data collection, whether for medical or non-medical services, or accompanying relatives, were approached and screened for eligibility. Those who met the inclusion criteria and provided informed consent were invited to participate. At this stage, participant recruitment followed a non-probability, consectutive sampling approach based. This approach was particularly suitable for rural settings, such as Ohangwena and Kavango West, where populations are

widely dispersed, and health facilities often serve as natural community gathering spaces. However, because participants were recruited among facility attendees, the final sample cannot be considered fully representative of all rural residents in the selected constituencies.

It is acknowledged that facility-based recruitment may introduce selection bias toward individuals already engaged in health services, potentially overestimating awareness levels and underestimating access barriers among non-attenders. To minimise social desirability bias, interviews were conducted in privately without the presence of facility staff, and research assistants emphasised confidentiality, voluntary participation, and the absence of any link between participation and access to health services.

Sample size determination

The sample size for phase 1 was determined by employing Cochran's (1977) formula for estimating sample size for proportions in large populations. Moreover, this method is widely applied in cross-sectional studies and provides a conservative estimate when prevalence data are limited. The formula is:

$$n_0 = \frac{Z^2\, p\,(1-p)}{d^2}$$

Where:

- n_0= initial sample size
- Z= 1.96 (standard normal value for 95% confidence)
- p= 0.5 (assumed population proportion; chosen as a conservative estimate that maximises sample size in the absence of prior data)
- d= 0.05 (margin of error)

Substituting the values:

$n_o = (1.96^2 \times 0.50 \times (1 - 0.50)) / (0.05^2)$

$n_o = (3.8416 \times 0.25) / 0.0025 = 384$

However, the final sample obtained was 231 participants. which was lower than the initially calculated Cochran estimate. This shortfall resulted from practical field constraints, including limited time and funding, long distances between facilities, poor road conditions, as well as low patient turnout at rural clinics. Data collection was conducted during routine service hours, and participant availability depended on facility attendance, which varied across sites.

Although the achieved sample size was smaller than the calculated estimate, the study retained sufficient cases to support descriptive and exploratory analyses within the sampled population. The reduced sample size may have affected statistical precision and the width of confidence intervals; however, the study was not primarily powered for complex hypothesis testing.

Moreover, the primary aim was to identify patterns and associations in knowledge, attitudes, and practices among community members. The quantitative findings were further complemented by

qualitative data from women and healthcare workers, which enhanced the depth, interpretation, as well as overall validity through methodological triangulation, of the study results thereby strengthening the credibility of the overall findings despite the smaller sample.

Qualitative (phases II and III)

3.6.1.1. Phase II: women's health-seeking behaviour

For the qualitative phase on women's health-seeking behaviour, purposive sampling was applied to identify participants who could provide rich and relevant information in the Ohangwena and Kavango West regions. Furthermore, two regions were purposively selected to represent rural settings with differing access levels to cervical cancer prevention services. Within these regions, three constituencies from (12 in Ohangwena and 8 in Kavango West).

Community health workers assisted in purposefully identifying eligible women who met the inclusion criteria and were willing to share their experiences. Women were approached if they were within the reproductive age range (18-49 years), lived in the study area, and had some exposure to reproductive health services such as cervical cancer screening, HPV vaccination, antenatal care, or family planning. Moreover, this process ensured that participants had firsthand insight into the impediments, perceptions, as well as decision-making processes that influence health-seeking behaviour. The sample size was guided by data saturation at 40 FGD, reached when additional interviews no longer yielded new themes or perspectives. Discussions were held at comfortable places identified by the community health workers.

3.6.2. Phase III: Health systems challenges

Healthcare workers were selected using purposive sampling, a method suitable for qualitative studies that seeks to gather rich, detailed insights from individuals with specific knowledge or experience. Furthermore, the sampling included nurses, doctors, community health workers, as well as programme officers who were directly involved in reproductive health services, cervical cancer prevention (CECAP), health promotion, or outreach activities within public facilities in Ohangwena and Kavango West. The Senior Medical Officers (SMOs) assisted in identifying eligible staff, as well as participants were approached based on their roles, availability, and experience with service delivery. This approach ensured variation across cadres, facility levels (clinics, health centres, and district hospitals).

Moreover, a total of 11 healthcare workers participated in the in-depth interviews. This sample size was guided by the qualitative aim of the study, which focused on depth rather than numerical representativeness. In qualitative research, sample adequacy is assessed through information richness and the achievement of thematic saturation, rather than statistical power. Furthermore, by the eleventh interview, no new major themes were emerging, indicating that saturation had been reached. Including additional participants would likely have resulted in repetition without providing meaningful new insights. The selected participants, therefore, provided a sufficiently diverse and comprehensive understanding of the health system constraints affecting cervical cancer prevention services in the two regions.

3.7. Data collection methods

Data collection for all phases was conducted between June and October 2024.

3.7.1. Phase I: KAP study

3.7.1.1. Instrument development

To address the first objective, a structured interviewer questionnaire (Appendix 1) was developed and administered to collect quantitative data from community members. Moreover, the questionnaire consisted mainly of closed-ended questions, including yes/no items, multiple-choice responses, and rating scales. The questionnaire was adapted from validated instruments, including the Cervical Cancer Knowledge-Prevention-64 (CCKP-64) and the Cervical Cancer Awareness Measure (CAM) developed by University College London (UCL, 2008), and modified to suit the Namibian rural context. The questionnaire was translated into Oshikwanyama and Rukwangali by bilingual language experts familiar with public health terminology.

To ensure conceptual equivalence, a back-translation process was conducted whereby an independent translator re-translated the local language versions into English. Discrepancies were reviewed and resolved collaboratively to maintain semantic and conceptual consistency across versions. The questionnaire consisted of four sections (A, B, C, and D). Section A assessed the socio-demographic history. Section B assessed participants' knowledge of cervical cancer and preventive measures. Section C explored the community's attitude, and Section D explored the practice of cervical cancer screening and HPV vaccination.

3.7.1.2. Mode of administration

To improve efficiency and minimise errors, the questionnaire was digitised and deployed by means of Kobo Toolbox, an open-source data collection platform suitable for low internet connectivity settings. Moreover, data was collected using Android tablets equipped with the Kobo Collect application. Since Kobo supports offline data entry, responses were captured during interviews in the selected rural areas of the constituency, which have limited internet access, and later uploaded to the central server once connectivity became available. More importantly, this process minimised the risk of data loss, reduced transcription errors, as well as ensured the timely availability of data for monitoring and analysis.

Interviews were conducted in person by trained research assistants, who administered the questionnaire verbally in either Oshikwanyama (Ohangwena) or Rukwangali (Kavango West), depending on the participant's language preference. The instrument was designed with skip patterns and validation checks to reduce input errors and enhance data quality. Each interview lasted between 10 and 15 minutes. Responses were captured offline during interviews and later uploaded to the Kobo server once internet connectivity was available, ensuring secure and efficient data management.

3.7.1.3. Pilot testing

A pilot study was conducted among 30 community members from two constituencies, who were not included in the main study (Engela in Ohangwena and Kapako in Kavango West). Moreover, the pilot assessed the clarity, flow, and cultural appropriateness of the questionnaire, as well as the functionality of Kobo Toolbox during data capture. Feedback from participants indicated that a few technical terms

required simplification, and the sequencing of attitude and practice items was adjusted to enhance logical flow and minimise respondent fatigue.

Furthermore, following these revisions, the questionnaire was subjected to internal consistency testing using Cronbach's alpha. The knowledge, attitude and practice sections were entered into SPSS, and reliability analysis was performed for each construct. All scales demonstrated acceptable internal consistency, with Cronbach's alpha values meeting the recommended minimum threshold of 0.70. After incorporating feedback and confirming reliability, the questionnaire was finalised for use in the main survey.

3.7.1.4. Recruitment and training of research assistants

Eight research assistants were recruited to support the data collection in the two study regions. Furthermore, selection was based on prior experience in health-related matters, proficiency in the local languages, as well as strong communication skills. Female research assistants were assigned to interview women to ensure cultural appropriateness, while male research assistants interviewed men. In the Ohangwena region, interviews were conducted in Oshikwanyama, while in Kavango West, they were conducted in Rukwangali, enabling participants to express themselves freely in their native languages.

A one-day training workshop was conducted to prepare the research assistants as well as to standardise the data collection process. A training manual (Appendix 2) was developed and adapted from Bryman's Social Research Methods (Bryman, 2016), modified to suit the local context of rural communities in Ohangwena and Kavango West. Furthermore, the adaptations focused on simplifying interviewer instructions, strengthening guidance on verbal translation, as well as aligning procedures with cultural norms and language use in the study regions.

Moreover, ethical considerations, such as obtaining informed consent, safeguarding privacy, and respecting cultural sensitivity, were also addressed. Research assistants were trained in using the Kobo Toolbox and the Kobo Collect application for interviewer-administered questionnaires, with an emphasis on offline data entry, synchronisation, as well as proper handling of skip patterns and filter questions. More importantly, the questionnaire was reviewed item by item, and mock interviews and group discussions were conducted to build confidence as well as ensure clarity in administering sensitive questions related to cervical cancer, sexual health, and cultural beliefs in a respectful and non-judgmental manner. Confidentiality protocols were applied, particularly adopting identification codes instead of names.

During the fieldwork, the principal supervisor provided close monitoring to ensure adherence to the study protocol. Furthermore, spot checks were conducted to observe interviews, review completed questionnaires on the Kobo Toolbox, as well as provide immediate feedback to research assistants as needed. Data were uploaded daily to the Kobo server to further strengthen quality control, where the researcher cross-checked completeness and accuracy. Moreover, any challenges during training or fieldwork, such as difficulties with skip logic or handling sensitive responses, were addressed promptly through clarifications, refresher guidance, and on-the-spot problem-solving. This supervision enabled to minimise interviewer bias, correct mistakes early, as well as maintain consistency across the two study regions. By the end of training and through ongoing supervision, all research assistants demonstrated

competency in approaching participants, explaining the study, obtaining oral informed consent, moreover, administering the questionnaire reliably, thereby ensuring the collection of high-quality and valid data.

3.7.1. Phase II: women's health-seeking behaviour

3.7.2.1. Instrument development

For the second objective, data were collected employing a semi-structured Focus Group Discussion (FGD) guide, which was developed in English (Appendix 3) and translated by language experts into Oshikwanyama and Rukwangali. The guide was developed in line with the socioecological Model. Moreover, the guide was structured to explore factors influencing health-seeking behaviour at multiple levels: Individual (knowledge, beliefs, and personal experiences), Interpersonal (family, peers, and community influences), Institutional (health service availability and accessibility), as well as Societal (cultural norms and gender roles).

3.7.2.2. Pilot testing

The guide was piloted in Engela (Ohangwena) and Kapako (Kavango West). Moreover, feedback from the pilot enabled refine the flow and language of the questions, adding simpler probes to clarify technical terms such as "screening" or "HPV vaccine." Some questions were reordered to create a more natural conversation flow, commencing with general awareness before discussing personal experiences as well as the impediments they present.

3.7.2.1. Data collection procedure

The research team consisted of the principal researcher and four trained female research assistants (two per region), who were senior nursing students as well as fluent in the study languages. To ensure consistency and quality, all assistants underwent a one-day training workshop facilitated by the researcher. Moreover, training sessions covered the study objectives, ethical principles (including informed consent and confidentiality), facilitation skills (such as probing, paraphrasing, as well as managing group dynamics), and a detailed review of the guide. Role-play exercises were conducted to build confidence as well as standardise facilitation techniques.

Furthermore, FGDs were organised with groups of eight women each, stratified to capture diversity in age and experiences. During each discussion, an assistant moderated, the principal researcher managed notetaking and audio recordings, moreover a second assistant paraphrased and probed to ensure clarity and depth. Each FGD lasted approximately 60-90 minutes and was conducted in private, participant-preferred community locations to create a comfortable environment for open dialogue. Importantly, this systematic approach to data collection ensured that discussions were well-facilitated, ethically conducted, moreover sensitive to cultural and linguistic dynamics, thereby strengthening the credibility and richness of the qualitative data generated.

3.7.2. Phase III: Health system challenges

3.7.3.1. Instrument development

For the third objective, data were collected using a semi-structured key informant interview (KII) guide in English (Appendix 4), developed based on the World Health Organisation (WHO) Health System Framework (WHO, 2007). The interview guide consisted of seven sections; each linked to these building blocks. These included: (1) Socio-demographic information ; (2) Service delivery, focusing on the availability and quality of screening, vaccination, and treatment services; (3) Health workforce, which covered staff numbers, training, workload, and distribution; (4) Health information systems, addressing how data are collected, reported, and used; (5) Leadership and governance, looking at coordination, accountability, and policy implementation; (6) Medical products and technologies, assessing the availability of screening tools, diagnostic equipment, and treatment supplies; and (7) Health financing, exploring resource allocation, donor support, and budget challenges. All questions were open-ended, with probes added to help participants explain their experiences and opinions in detail.

3.7.3.2. Pilot testing

The draft guide was then pilot tested with two nurses in each region, who represented the study population, however, they were excluded from the main study to prevent bias. Moreover, the pilot revealed areas needing improvement. Some technical terms, such as “health information system,” were difficult for participants to understand, so simpler phrases like “record keeping and reporting of patient information” were adopted. Some questions, particularly those related to leadership and governance, were considered too broad, so more specific probes were added to focus on supervision, accountability, and policy enforcement.

In addition, feedback from the pilot also suggested that the order of topics could be improved. Initially, health financing was discussed before medical products and technologies; however, participants found it more logical to discuss medicines and equipment first, so the sections were reordered. Additional probing questions were added under the health workforce section to explore staff motivation and retention, which participants indicated as major challenges. These adjustments made the final interview guide clear, relevant, and practical, ensuring it captured rich as well as meaningful data aligned with the study’s objectives.

3.7.3.3. Data collection procedure

Data was collected through in-depth interviews. Prior to each interview, participants were provided with an information sheet detailing the purpose, scope, and ethical safeguards of the study. Moreover, the researcher explained the study aims, clarified any questions, and obtained written informed consent before proceeding. All interviews were conducted in English as well as held in private spaces within hospital settings to ensure confidentiality and comfort. Depending on participant availability and the depth of discussion, interviews lasted between 26 and 48 minutes. With permission, all sessions were audio-recorded and complemented by field notes taken by the researcher. Data saturation, the point at which no new information or themes were emerging, was reached after nine interviews. To ensure robustness and confirm saturation, two additional interviews were conducted, bringing the total number of interviews to eleven.

3.8. Study variables and measurement

3.8.1. Phase I: Quantitative variables

The knowledge of participants was assessed through a set of closed-ended questions that evaluated their awareness of cervical cancer, its risk factors, symptoms, screening methods, and HPV vaccination. Furthermore, each correct response was assigned a score of 1, while incorrect or "do not know" responses were assigned a score of 0. The total knowledge score was obtained by totalling all correct answers and then categorised to enable comparison of knowledge levels among participants as follows: good knowledge (≥ 75% correct responses), moderate knowledge (50–74% correct responses), and poor knowledge (< 50% correct responses). The categorisation thresholds (≥75% good; 50–74% moderate; <50% poor) were informed by commonly applied KAP scoring conventions in public health research, where a 75% cut-off is frequently used to indicate adequate knowledge.

Attitudes toward cervical cancer prevention were assessed through a Five-point Likert scale items were used to assess participants' attitudes toward cervical cancer prevention. Responses ranged from 1 (strongly disagree) to 5 (strongly agree). Negatively worded items were reverse coded to ensure consistency. The total attitude score was converted into a percentage and categorised as positive attitude (≥ 50%) and negative attitude (< 50%).

Furthermore, preventive practices were assessed through questions that assessed screening history, HPV vaccination status, as well as participation in preventive activities, such as health education sessions. Responses were coded as "Yes = 1" and "No = 0." The total practice score was converted into percentages and categorised as good practice (≥ 75%), fair practice (50–74%), and poor practice (< 50%); however, no participants fell within the fair band. Therefore, the results were presented as good versus poor only. Moreover, independent variables included socio-demographic characteristics that could influence knowledge, attitudes, and practices.

3.8.2. Phase II and III: Qualitative variables

Variables in the qualitative phases were conceptual and thematic in nature rather than numerical. Moreover, the variables relating to women's health-seeking behaviour were examined across multiple levels of influence. At the individual level, themes included women's perceptions of cervical cancer risk, personal beliefs about screening and vaccination, as well as knowledge or misconceptions about symptoms and causes. In addition, the interpersonal level focused on spousal, family, and peer influences on seeking care, as well as the role of community support or stigma. The institutional level examined the accessibility and responsiveness of health facilities, the availability of female healthcare providers, and the perceived quality and confidentiality of services. At the community and societal level, variables captured broader cultural beliefs, gender norms, as well as the role of traditional and community leaders in influencing preventive health decisions.

In relation to the health system constraints, data collection and analysis were guided by the World Health Organisation (WHO) Health System Framework, which identifies six key building blocks. Moreover, these included service delivery (availability and quality of screening, vaccination, and treatment services), the health workforce (staff numbers, training, motivation, and workload), health information systems (data recording, reporting, and utilisation), leadership and governance (coordination, supervision, and accountability), medical products and technologies (availability of screening tools and supplies), as well as health financing (budget allocation, donor support, and financial barriers).

3.9. Data analysis

3.9.1. Phase I: Statistical analysis

The quantitative data obtained from the structured questionnaires were first exported from Kobo Toolbox into Microsoft Excel for cleaning and coding and then imported into SPSS (Statistical Package for the Social Sciences) version 29 for analysis. Moreover, data cleaning involved inspecting for completeness, accuracy, and consistency; invalid or incomplete responses were excluded from the analysis. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were adopted to summarise socio-demographic characteristics as well as responses related to knowledge, attitudes, and practices (KAP) on cervical cancer prevention.

Knowledge, attitude, and practice scores were computed based on pre-defined criteria, and participants were categorised according to their level of knowledge (good, moderate, or poor), attitude (positive or negative), and practice (good, fair, or poor). Cross-tabulations and chi-square tests were conducted to examine the associations between KAP variables and socio-demographic characteristics, including age, sex, education, and marital status. A p-value of < 0.05 was considered statistically significant. In addition, multivariable logistic regression models were conducted to identify independent predictors of key outcomes, including ever-screened status. Variables with $p < 0.20$ in bivariate analysis were entered into the regression models. Adjusted odds ratios (AORs) with 95% confidence intervals were reported.

3.9.2. Phase II and III: Thematic analysis

For the qualitative data, all focus group discussions and key informant interviews were audio-recorded, transcribed verbatim, and reviewed for accuracy. Furthermore, transcripts were read several times to gain familiarity with the content before being imported into ATLAS. ti version 23 for systematic analysis. The analysis followed the principles of thematic analysis, allowing patterns, meanings, and relationships to emerge inductively from the data. Moreover, codes were assigned to relevant text segments based on recurring ideas or phrases, which were then grouped into categories and broader themes.

In addition to thematic analysis, a summative content analysis approach was applied to identify recurring keywords and frequently emphasised concepts within participants' narratives (Faria-Schützer et al., 2021). This approach involved examining patterns of language use and the relative prominence of certain ideas across discussions, thereby complementing thematic interpretation with structured pattern recognition. The use of summative content analysis strengthened analytic depth by enabling both qualitative interpretation and identification of dominant issues raised by participants.

For women's health-seeking behaviour, themes were organised according to the Socioecological Model for Health Behaviour, encompassing individual, interpersonal, institutional, and societal levels of influence. For the health system phase, themes were structured around the six WHO Health System Framework building blocks, focusing on service delivery, human resources, information systems, leadership and governance, medical technologies, and financing. More importantly, to ensure rigour and transparency, coding consistency was examined through peer debriefing and repeated review of transcripts, while an audit trail was maintained throughout the analysis process. Finally, data integration

was conducted through triangulation, where findings from the quantitative and qualitative phases were compared and interpreted together to provide a comprehensive understanding of cervical cancer prevention in the study regions.

3.10. Field notes

Brief field notes were recorded throughout data collection to document contextual factors, participant engagement, environmental conditions, as well as researcher reflections. These observations enhanced the interpretation of findings as well as supported triangulation across the three objectives.

Phase I: Assess Knowledge, attitudes, and practices

Field notes from phase one captured the setting and logistical realities of administering questionnaires in rural communities. Furthermore, most surveys were completed at health facilities. Participants were generally cooperative, although some required additional clarification of medical terms such as HPV and screening. Older respondents occasionally preferred lengthy explanations. Environmental distractions were noted as practical challenges.

Phase II: Explore women's health-seeking behaviour

During the focus group discussions, field notes concentrated on participants' comfort levels, emotional responses, as well as the impact of cultural norms. Moreover, initial hesitation was common, however trust improved as discussions progressed. Sensitive topics, such as screening fears, partner influence, and personal experiences, often trigger strong emotions. Furthermore, non-verbal cues, such as pauses, a lowered tone, or supportive gestures, offered additional insight into women's perceptions, moreover, informed the interpretation of qualitative themes.

Phase III: Health system challenges

Field notes from in-depth interviews with healthcare workers recorded details about workload, interruptions, resource shortages, and clinic organisation. Furthermore, interviews were often conducted between patient consultations, and frequent interruptions reflected high workloads in rural facilities. Visible shortages of screening instruments, staff rotation patterns, as well as referral delays were commonly observed. Health workers expressed strong willingness to support cervical cancer prevention, however, indicated systemic impediments.

3.11. Measures to ensure reliability, validity, and trustworthiness

This study employed several strategies to ensure methodological rigour across both the quantitative and qualitative components. The procedures were guided by recognised methodological standards for mixed-methods research (Creswell & Creswell, 2022; Neuman, 2021; Flick, 2022) and were implemented from instrument development to data analysis. Each form of rigour is presented below, with clear indications of how it was achieved in each phase of the study.

3.11.1. Validity

Validity refers to how well the tools and processes measured what they were intended to measure (Creswell & Creswell, 2022).

Quantitative Phase

a) Content and construct validity

Content and construct validity were established through an extensive review of validated cervical cancer instruments, including the Cervical Cancer Knowledge-Prevention-64 (CCKP-64) as well as the Cervical Cancer Awareness Measure (CAM). Moreover, items were adapted to suit the Namibian rural context, ensuring alignment with the concepts of knowledge, attitudes and practices.

b) Expert review

The draft questionnaire underwent review by public health experts, supervisors and research specialists at the Namibia University of Science and Technology (NUST). Their feedback ensured conceptual clarity, cultural suitability as well as relevance to rural Ohangwena and Kavango West.

c) Pilot testing

A pilot test was conducted employing a small sample representative of the target population. This assessed clarity, sensitivity and cultural appropriateness. Suggested revisions (for example, rewording ambiguous items) were incorporated into the final version of the questionnaire.

d) External validity

External validity was strengthened through a multistage probabilistic sampling approach that ensured a representative sample of men and women from multiple rural constituencies. Furthermore, standardised administration procedures also ensured that all participants received uniform instructions and questions, minimising systematic errors.

Qualitative Phase

a) Methodological triangulation

Credibility (the qualitative equivalent of validity) was enhanced through triangulation. Moreover, data were collected from women in communities and healthcare providers in facilities. More importantly, this enabled comparison and convergence of perspectives on cervical cancer prevention.

b) Expert-reviewed guides

Interview and focus group guides were developed adopting the study's theoretical frameworks and refined with input from qualitative research experts. This ensured that questions accurately captured women's lived experiences and health system constraints.

3.11.2. Reliability

Reliability refers to the consistency and stability of a measurement over time and across different conditions. To ensure reliability in the quantitative phase, the structured questionnaire was pilot tested to assess the consistency of responses as well as verify that participants uniformly interpreted the questions. Moreover, the pilot study confirmed that the instrument was clear and culturally appropriate, resulting in only minor wording adjustments. Internal consistency of the questionnaire was further tested

adopting Cronbach's alpha, with reliability coefficients above 0.7 considered acceptable for knowledge, attitude, and practice scales. In addition, all research assistants underwent comprehensive training to standardise interviewing techniques as well as ensure consistent data collection across regions. Daily supervision and random spot checks by the researcher during fieldwork further reinforced the consistency and accuracy in administering questionnaires.

For qualitative data, reliability, referred to as dependability in qualitative research, was achieved through maintaining detailed documentation of the data collection and analysis processes. Furthermore, all interviews and focus group discussions were recorded, transcribed verbatim, and moreover reviewed multiple times to ensure completeness. Peer debriefing sessions with supervisors and colleagues also enhanced dependability by providing external perspectives on data interpretation and coding accuracy.

3.11.3. Trustworthiness of qualitative data

In line with Lincoln and Guba's framework (as cited in Neuman, 2021), the trustworthiness of qualitative findings was ensured through the criteria of credibility, transferability, dependability, and confirmability.

3.11.3.1. Credibility

Credibility was strengthened by ensuring that only willing and informed participants participated in the study. Moreover, participants were assured of confidentiality, which encouraged them to be open and honest in their responses. Data triangulation across participant groups (women and healthcare workers) also enhanced credibility by enabling convergence and corroboration of findings from different sources.

3.11.3.2. Transferability

Transferability was promoted through detailed descriptions of the study context, participant characteristics, as well as data collection procedures. Furthermore, this detailed description enables readers and other researchers to assess the applicability of the findings to similar rural contexts in Namibia or other sub-Saharan African settings.

3.11.23.3. Dependability

As noted above, this was ensured by maintaining a clear audit trail of field activities, data transcription, and analysis steps. In addition, all methodological decisions, interview schedules, as well as field notes were preserved to document how data were gathered and interpreted over time.

3.11.3.4. Confirmability

Confirmability was maintained by ensuring that the findings accurately reflected the participants' perceptions and lived experiences, rather than being influenced by researcher bias or preconceived ideas. Moreover, reflexive notes were kept throughout the research process to acknowledge potential personal influences. In addition, supervisors at NUST reviewed coding frameworks and interpretations during the analysis phase to provide independent verification of the findings.

3.11.4. Reflexivity

In qualitative research, researchers reflect on how their role in the study, as well as their background, culture, and experience, may influence their interpretations, including the themes they identify and the meanings they attribute to the data. The researcher holds a Master of Public Health degree moreover is employed as a lecturer at Namibia University of Science and Technology, in the field of Health Information Systems Management, with prior experience in public health. Importantly, this background provided a valuable contextual understanding of health system dynamics however it also required conscious reflection to minimise bias. Furthermore, a reflexive journal was kept throughout data collection and analysis to record assumptions, emotional reactions, and decisions, ensuring transparency and self-awareness. Regular debriefing with supervisors also enabled to challenge personal interpretations and maintain analytical neutrality.

In addition, awareness of potential power dynamics between the researcher and participants was maintained, particularly when interviewing health workers who may have perceived the researcher as professionally aligned with the health system. Efforts were made to create a neutral and open interview environment by emphasising confidentiality, voluntary participation, and the absence of performance evaluation. During analysis, themes were grounded in verbatim participant quotations to ensure that interpretations remained closely linked to participants' lived experiences rather than the researcher's prior expectations. Reflexivity thus served as a continuous process of acknowledging and managing the researcher's influence on participant interactions and interpretation of findings.

3.12. Phase IV: Model development

The final phase of this study focused on developing a community-based prevention model for cervical cancer management in the Ohangwena and Kavango West regions of Namibia. Furthermore, this phase synthesised empirical evidence from Phase I to Phase III to generate a practical, theory-informed model tailored to Namibia's rural health context.

3.12.1. Study design and approach

The development of this model was grounded in both theoretical and methodological principles that ensured scientific rigour and contextual relevance. Moreover, the process was guided by three main theoretical frameworks: Health Belief Model, the socioecological model, as well as the World Health Organisation (WHO) Health System Building Blocks Framework, and by model development principles proposed by Chinn and Kramer (2023) and Walker and Avant (2019).

3.12.2. Data sources and concept identification

Concept identification was guided by data from all three phases of the study. Phase I provided quantitative evidence on community knowledge, attitudes and practices, highlighting gaps in awareness, screening behaviour and understanding of HPV. Phase II added qualitative insights into women's experiences, demonstrating how fear, partner influence, cultural norms as well as social support shaped health-seeking

behaviour. Phase III contributed to health-system perspectives, revealing gaps in coordination, funding, staffing as well as instruments that affected service delivery.

These findings were coded, compared and grouped into recurring patterns. Moreover, concepts that appeared consistently across phases were clustered together and refined. Behavioural and cognitive concepts were informed by the HBM, socio-cultural influences were guided by the socioecological model, and systemic concepts were aligned with the WHO health system building blocks. This ensured that each concept was grounded in empirical evidence while linked to established theory. Through this process, the core concepts for the community, service and systemic levels were identified and prepared for the next steps of relationship building and structural arrangement.

3.12.3. Construction of Relationship Statements

The identified concepts were examined to determine how they influence one another within the prevention pathway. Furthermore, this process involved comparing themes across phases, reviewing participant narratives, as well as mapping the direction of influence between concepts. For each pair of related concepts, a relationship statement was developed to describe how and why one concept leads to, enables or reinforces another.

Solid arrows were employed to represent direct, one-way relationships (e.g. Information Access → Health Literacy), while double-headed arrows were assigned only where bi-directional influence was evident in the data (e.g. Social Support ↔ Health-Seeking Behaviour). Dotted arrows were assigned to represent feedback loops indicating how outcomes such as increased screening or early detection generate learning that informs community behaviour, service delivery adjustments, as well as system-level planning. This step clarified the internal logic of the model by demonstrating the sequence of influence from community behaviour to service delivery, to system readiness, and finally to measurable prevention outcomes.

3.12.4. Model structuring and diagrammatic design

The model was organised into a three-layer framework to illustrate the natural progression of influence from the community to the service level and finally to the broader health system. Moreover, this structure reflects how cervical cancer prevention unfolds in rural settings, where behavioural, service and system factors interact continuously. The community level forms the foundation of the model because prevention commences with what women know, believe and experience in their homes and social environments. Furthermore, concepts such as information access, health literacy, empowerment, social support, health-seeking behaviour as well as cultural influence shape how individuals understand cervical cancer, make decisions about screening as well as engage with available services. Building on this, the service level represents the point where community readiness is translated into action. This layer includes access and availability, integrated service delivery, the health workforce, trust in the health system, quality of care and the referral system, which combined determine whether women can obtain timely, respectful and reliable screening and follow-up.

At the top, the systemic level provides the enabling environment required for services to function effectively. This includes political commitment, funding, information packages, multisectoral partnership, digital health systems, as well as stewardship and coordination, all of which contribute to system readiness and long-term support. Together, these three layers form an interconnected structure with continuous feedback, where empowered communities, effective services as well as supportive systems reinforce one another to achieve strengthened community-based cervical cancer prevention.

3.12.5. Model validation

A validation tool (Appendix 5) was developed to validate the proposed model through expert validation. During expert validation, the draft model was reviewed by professionals from various fields of reproductive health. Furthermore, these experts assessed the model's conceptual clarity, simplicity, generality, accessibility, and importance. In simple terms, they argue that a good model must be clear in its concepts and relationships, simple enough to follow without unnecessary complexity, and general enough to be applied across different contexts beyond the original study site. It should also be accessible, meaning it is easy for practitioners, policymakers, and other users to understand and apply in real-world settings, not merely in theory. Ultimately, it must demonstrate importance, indicating that it addresses a meaningful challenge, moreover, can contribute to improved practice, decision-making, or outcomes.

3.13. Merging of the study phases

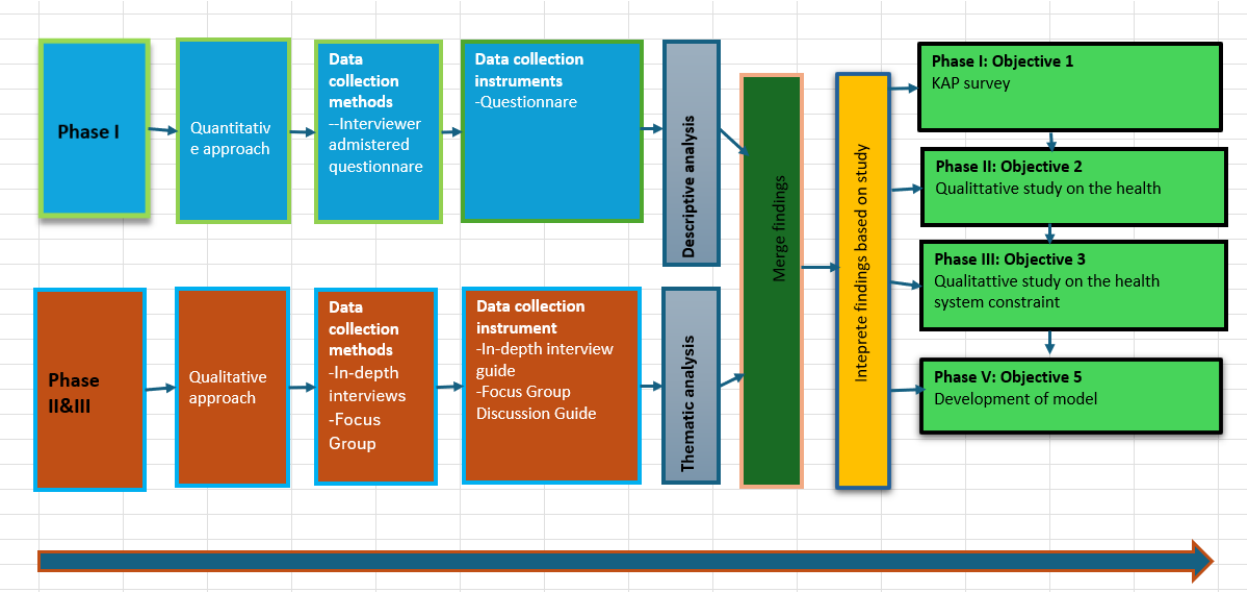


Figure 2.3: Schematic illustration of the study's methodological process

Source: Researcher's own illustration (2025).

3.14. Ethical clearance and permission to conduct research

This study was conducted in accordance with established ethical principles governing human research, including respect for people, beneficence, non-maleficence, and justice. In addition, ethical approval was obtained from the Research Ethics Committee of the Faculty of Health, Natural Resources and Applied Sciences at the Namibia University of Science and Technology (NUST) (Ref: FHAS: 2025/10) (Appendix 6) and from the Ministry of Health and Social Services (MoHSS) (Ref: 22/3/1/2) (Appendix 7). Permission to collect primary data for all study phases, quantitative (Objective 1) and qualitative (Objectives 2 and 3), was also secured from the Ohangwena (Appendix 8) and Kavango West (Appendix 9) regional health directorates. More importantly, these approvals authorised data collection within the public health facilities in both regions.

3.14.1. Autonomy and informed consent

Respect for autonomy was upheld throughout the study by ensuring voluntary and informed participation. All prospective participants received a detailed explanation of the study objectives, procedures, potential risks, and anticipated benefits. Moreover, information sheets were provided in English, Oshikwanyama, and Rukwangali to ensure comprehension across linguistic groups. Participants were informed of their right to decline participation or withdraw from the study at any point without punitive consequences. Furthermore, written informed consent (Appendix 10) was obtained from each participant before data collection. No coercion or undue inducements were employed to encourage participation. The researcher and trained assistants ensured that participants fully understood the consent process, including the purpose of the audio recording for the qualitative phases.

3.14.2. Confidentiality and anonymity

Confidentiality and anonymity were strictly maintained throughout the research process. Personal identifiers such as names, phone numbers, and physical addresses were not recorded on any data collection instrument. Equally important, each participant was assigned a unique code to ensure anonymity during data entry and analysis. All electronic data were stored on password-protected laptops, and access was limited to the principal researcher. Hard-copy materials, such as consent forms and field notes, were stored in locked cabinets accessible only to the researcher.

For data sharing within the supervisory team, encrypted flash drives and secure email channels were employed. All audio recordings and transcripts from Phases II and III were kept confidential and employed solely for research purposes. Data will be retained for three years following the completion of the study, moreover, it will then be permanently deleted or shredded to protect participant privacy.

3.14.3. Non-maleficence

The principle of non-maleficence, avoiding harm, was carefully observed. Participants were assured that their involvement in the study would not expose them to any form of physical, psychological, or social harm. Furthermore, the nature of the research did not involve invasive procedures, and all questions were phrased sensitively to avoid discomfort, particularly regarding reproductive health. Participants were also

informed that their responses would not influence their access to health services or their relationship with healthcare providers.

3.14.4. Beneficence

Although participants did not receive direct material benefits from the study, their participation contributed to generating knowledge that could strengthen cervical cancer prevention and management in Namibia. More importantly, the findings are expected to inform health policy, improve community awareness, as well as guide service delivery interventions in rural settings such as Ohangwena and Kavango West. Thus, the study provided indirect societal benefits through the potential application of its recommendations by the Ministry of Health and other public health stakeholders.

3.15. Integrity and responsible use of Artificial Intelligence (AI)

The researcher employed Artificial Intelligence instruments, in particular Quill Bot and Grammarly. These tools were employed strictly as assistive mechanisms to refine language and structure; they did not generate, manipulate, or interpret any original data, analysis, or results. Moreover, the researcher conducted all analytical reasoning, interpretation, and conclusions. The use of AI adhered to institutional principles of academic integrity, ensuring transparency, accuracy, and acknowledgement of all sources.

3.16. Research Dissemination

To strengthen the relevance and visibility of this work, the researcher has already begun sharing the study findings through academic publications and professional platforms. This ensures that the evidence generated contributes to the wider cervical cancer prevention discourse in Namibia and the region. Results from the quantitative phase 1 have been published as a peer-reviewed article titled “Cervical cancer prevention in rural Namibia: A cross-sectional analysis of community knowledge, attitudes, and practices in Ohangwena and Kavango West” (Ndakukamo, Mahalie, & Hailonga, 2025), included as (Appendix 11).

The qualitative study on health system constraints has also been published in the African Journal of Primary Health Care & Family Medicine as “Health system constraints in cervical cancer prevention in rural Namibia: A qualitative study” (Ndakukamo, Mahalie, & Hailonga-van Dijk, 2025), presented as (Appendix 12). In addition, a manuscript based on the women’s health-seeking behaviour findings, titled “Health-Seeking Behaviour of Rural Women for Cervical Cancer Prevention in Namibia: A Qualitative Study,” has been submitted to the Journal of Public Health in Africa and is currently under review; this is included as (Appendix 13). These dissemination initiatives enabled the researchers to refine their interpretations through external peer review, ensuring that the study makes a meaningful contribution to academic, policy, and community-level conversations on cervical cancer prevention.

3.17. Summary

This chapter outlined the research methodology adopted for the development of a community-based prevention model for cervical cancer management in the Ohangwena and Kavango West regions of Namibia. Moreover, the researcher discussed the research design and approach, described the study population, sampling procedures, and sample size, as well as explained the methods adopted for data collection and analysis. Challenges related to validity, reliability, and trustworthiness were also addressed, alongside ethical considerations to ensure the protection of participants. The next chapter presents the study results in line with the research objectives.

CHAPTER 4: RESULTS

4.1. Introduction

The previous chapter described the research methodology and reasoning strategies employed by the researcher to address the research objectives. Moreover, this chapter presents the results of the study, which assessed community members' knowledge, attitudes, and practices (KAP) regarding cervical cancer prevention, as well as explored women's health-seeking behaviour and health system constraints in the Ohangwena and Kavango West regions of Namibia. The findings are organised according to the study objectives and include both quantitative and qualitative findings. Finally, results are presented in tables, figures, and narrative explanations for clarity.

4.2. Presentation of quantitative results [phase I]

4.2.1. Socio-demographic characteristics of respondents

A total of 231 respondents were included in the quantitative phase of the study. Table 4.1 presents the socio-demographic profile of the study respondents. Most respondents were aged 25-34 years (33.8%), followed by those aged 18-24 years (30.3%) and 35-44 years (25.9%), while only 10.1% were between 45-59 years. Most respondents were female (69.7%), reflecting the gendered nature of cervical cancer prevention.

In terms of education, nearly half (49.6%) had attained secondary education, while 36% had tertiary qualifications and 14.5% had primary or no formal education. Regarding employment, 60.5% of participants were unemployed, and 39.5% were employed or self-employed, suggesting that many participants came from low-income or informal economic backgrounds. The majority were single (87.3%), while 12.7% were married. Contraceptive use was relatively common, with 82% reporting current or previous use. In addition, 65.4% had between one and five children, 25% had none, and 9.6% had six or more children.

These characteristics suggest a predominantly young, female, and moderately educated population, most of whom were unemployed and single. Such demographics may influence awareness levels, attitudes, and access to cervical cancer prevention services, underscoring the need for targeted health communication strategies that consider age, education, and socio-economic status.

Table 4.1: Socio-Demographic Characteristics of Respondents

Variables	Categories	n (%)
Age (years)	18-24	69 (30.3)
	25-34	77 (33.8)
	35-44	59 (25.9)
	45-59	23 (10.1)
Gender	Male	69 (30.3)
	Female	159 (69.7)
Education	Primary/Illiterate	33 (14.5)
	Secondary	113 (49.6)
	Tertiary	82 (36.0)
Employment status	**Unemployed**	138 (60.5)
	Employed/self-employed	90 (39.5)
Marital status	**Single**	199 (87.3)
	Ever married	29 (12.7)
Contraceptive usage	**Yes**	187 (82.0)
	No	41 (18.0)
Number of children	0	57 (25.0)
	1-5	149 (65.4)
	6 and above	22 (9.6)

Source: Author (2025).

4.2.2. Knowledge of cervical cancer prevention

4.2.2.1. Awareness of cervical cancer among respondents

To assess basic awareness, respondents were first asked whether they had ever heard of cervical cancer, cervical cancer screening, and cervical cancer screening services. Figure 4.1 below presents the proportion of respondents who reported awareness of these three aspects. The chart shows that nearly all respondents (94.6%) had heard of cervical cancer, indicating high general awareness of the disease.

However, awareness of cervical cancer screening (41.1%) and available screening services (30.2%) was considerably lower. These findings reveal a significant gap between awareness of the disease itself and awareness of available preventive services. Moreover, while most respondents recognise cervical cancer as a health concern, far fewer are aware of screening as a preventive measure or know where screening services can be accessed. This pattern suggests that health communication efforts in the study areas may focus more on raising general awareness of cervical cancer rather than providing detailed information about available prevention services. As a result, community members may understand that cervical cancer is a serious condition but may not know how or where to access screening services for prevention.

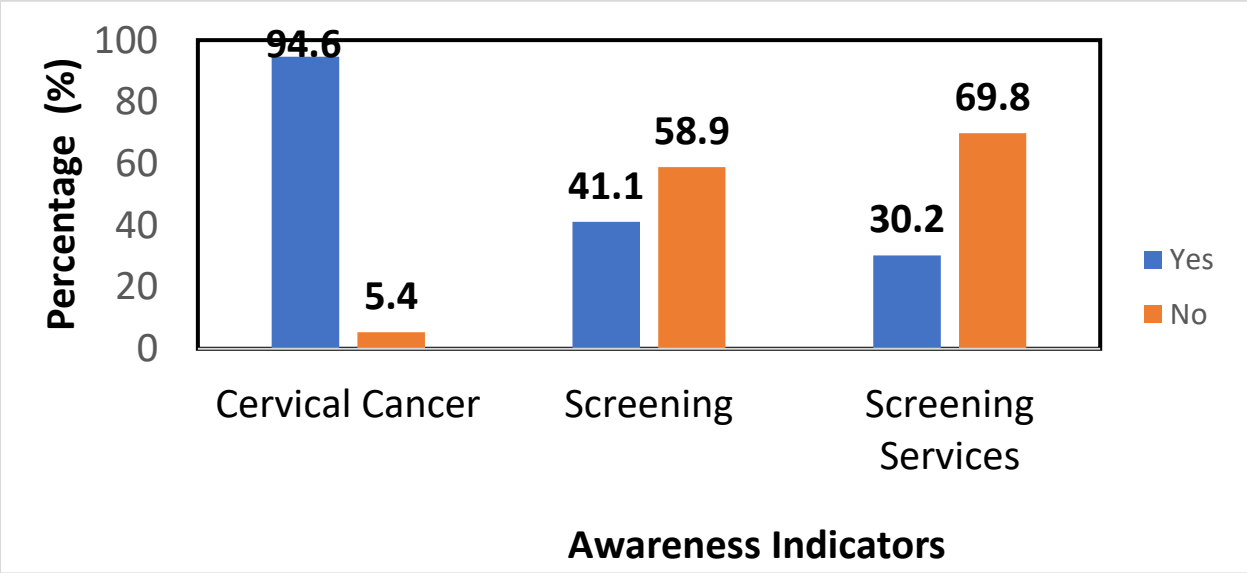


Figure 4.1: Awareness of Cervical Cancer, screening, and screening services

Source: Author (2025).

4.2.2.2. Source of information about cervical cancer

Respondents were requested to indicate where they first learned about cervical cancer. Multiple responses were allowed to capture the variety of information sources available to community members. Figure 4.2 summarises the primary sources of information reported. As presented in Figure 4.6, the majority (57.1%) reported receiving information from health workers, highlighting the crucial role that healthcare professionals play in disseminating accurate knowledge within communities. Radio and television were the second most common sources (29.0%), followed by teachers (20.2%) and family, friends, and neighbours (11.9%). Fewer participants cited social media platforms, such as WhatsApp, Facebook, Instagram, and TikTok (9.1%), as sources of information, while traditional print media, including newspapers and magazines, accounted for only 7.5%. Very few respondents relied on brochures, posters, and billboards (3.6%) or religious leaders (1.2%) for information.

These findings indicate that interpersonal communication, particularly through healthcare providers and local teachers, remains the dominant channel for sharing health information about cervical cancer

prevention. However, the relatively low use of social media and print materials suggests an opportunity to expand communication strategies by integrating digital platforms, community radio, as well as faith-based outreach to reach wider and younger audiences, particularly in rural settings.

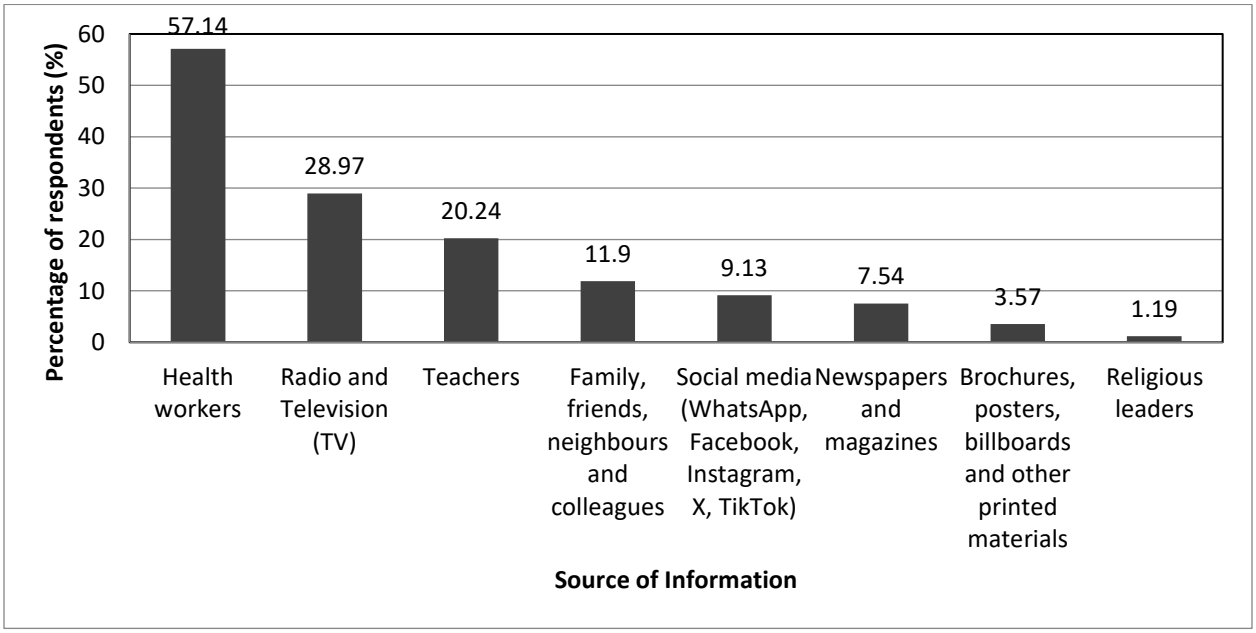


Figure 4.2: Source of information about cervical cancer.

Source: Author (2025).

4.2.2.3. Knowledge of cervical cancer risk factors among respondents

To assess Knowledge of cervical cancer causes, respondents were presented with a list of possible risk factors; moreover, they were allowed to select more than one option. Figure 4.3 below indicates that multiple sexual partners (28.9%) and early sexual activity (11.6%) were the most frequently selected risk factors, followed by infection with HPV (9.8%). However, 26.8% of participants reported being unaware of any risk factors. Moreover, a small number also selected incorrect options, such as bathing with soap or believing that cervical cancer results from being unlucky in life. These results indicate that while some participants possess partial knowledge of sexual risk factors, understanding of biomedical causes, particularly HPV infection, remains limited. The high proportion of participants who were uncertain or held misconceptions demonstrates persistent knowledge gaps and misinformation in the community. The findings indicate that many community members still rely on cultural beliefs or incomplete information when conceptualising the causes of cervical cancer. This can influence their preventive behaviour, such as delaying screening or ignoring early symptoms.

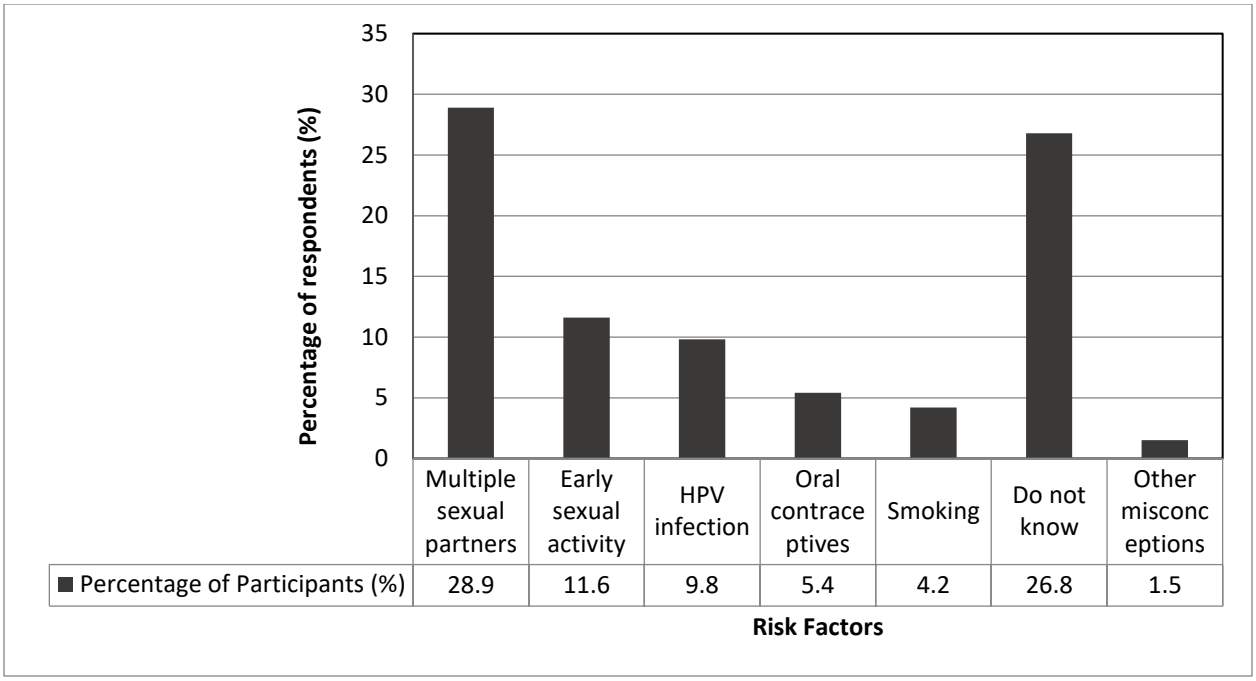


Figure 4.3: Knowledge of cervical cancer risk factors.

Source: Author (2025).

4.2.2.4. Knowledge of cervical cancer prevention and screening methods

To assess knowledge of cervical cancer prevention, respondents were presented with a list of possible prevention and screening methods; moreover, they were allowed to select more than one option. Figure 4.4 illustrates that most respondents (40%) reported not knowing any prevention method, followed by awareness of Pap smear (about 39%) and avoiding multiple partners (29%). Fewer respondents identified HPV vaccination (22%) and Visual Inspection with Acetic Acid (VIA) (18%) as prevention methods. These findings indicate that community knowledge of key prevention strategies, particularly HPV vaccination and VIA, remains low. Furthermore, the high proportion of participants who did not know any prevention method suggests substantial gaps in understanding how cervical cancer can be prevented or detected early. This underscores the need for more focused community education that explains available screening services and emphasises the role of HPV vaccination in prevention.

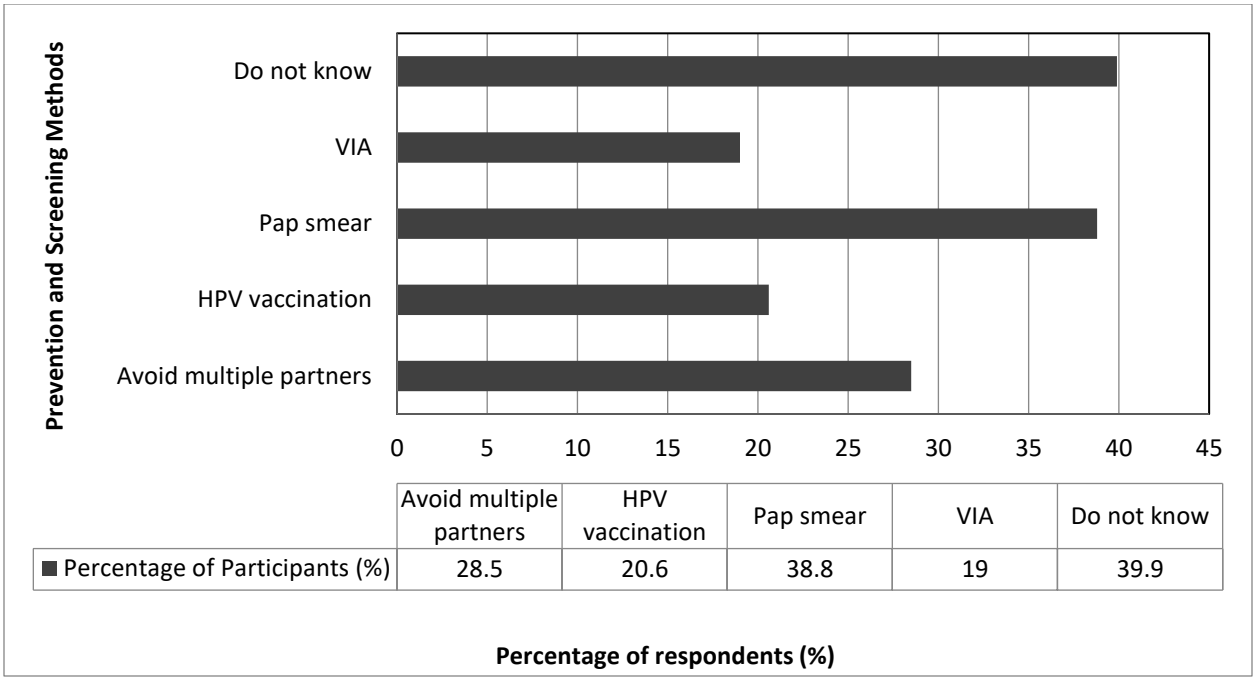


Figure 4.4: Knowledge of Cervical Cancer Prevention and Screening Methods

Source: Author (2025).

4.2.2.5. Knowledge of the signs and symptoms of cervical cancer among respondents

To assess knowledge of cervical cancer symptoms, respondents were presented with a list of possible signs, and were allowed to select more than one option. Figure 4.5 illustrates that the most frequently identified symptom was pain during sexual intercourse (25.3%), followed by bleeding between periods (22.3%) and foul-smelling vaginal discharge (16.2%). Fewer participants selected weight loss (7.2%) or urinary urgency (3.3%) as their primary concern. Notably, 25.6% of respondents reported not knowing any symptoms. These findings indicate that although some participants recognised a few key symptoms, overall knowledge of cervical cancer warning signs remains limited. Moreover, the high proportion of individuals who could not identify any symptom reflects a significant gap in the community's ability to recognise early indicators of the disease. This limited awareness of symptoms may contribute to delayed health-seeking behaviour, leading to late diagnosis and poorer outcomes.

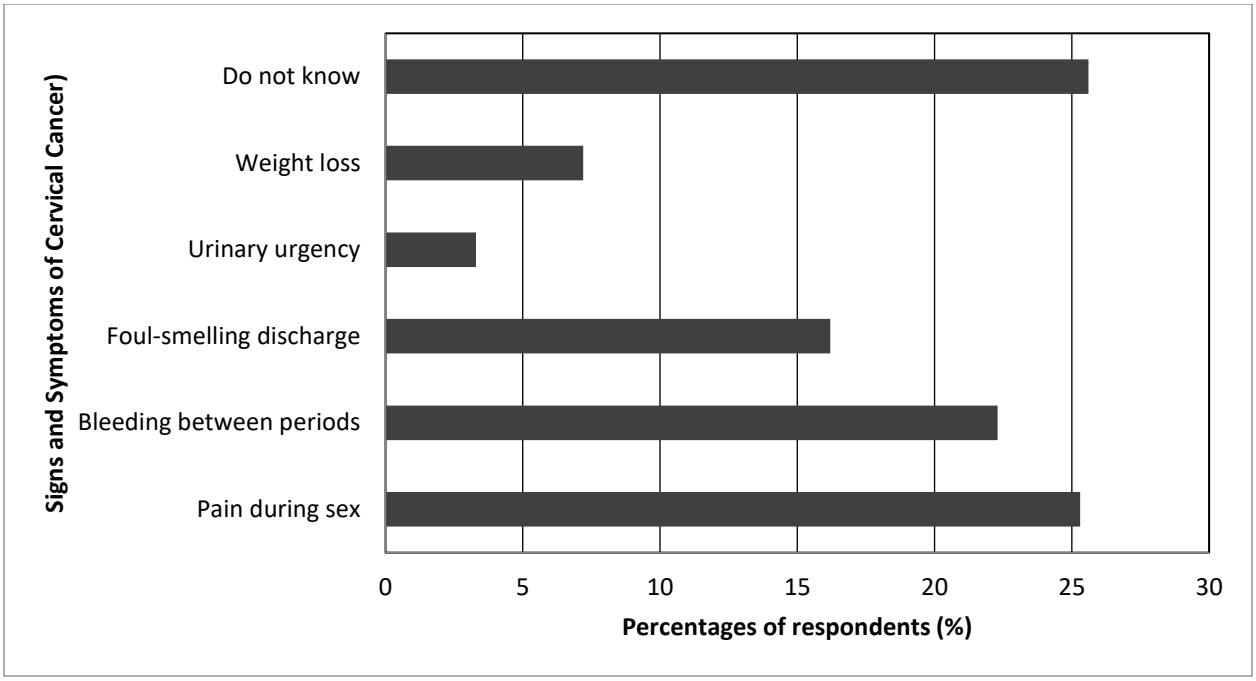


Figure 4.5: Knowledge of the signs and symptoms of cervical cancer among respondents.

Source: Author (2025).

4.2.2.6. Awareness of whether cervical cancer can be prevented

To assess perceptions of cervical cancer prevention, respondents were questioned whether they believed the disease could be prevented. Figure 4.2 illustrates that most participants (79.8%) reported that cervical cancer can be prevented, while 20.2% believed it cannot. This reflects a generally positive perception toward the prevention of cervical cancer, although a notable minority still lack accurate information. These findings suggest that while many respondents have a basic understanding that cervical cancer is preventable, they may not fully comprehend what prevention involves. Furthermore, several participants may associate “prevention” with general health behaviours rather than specific measures such as HPV vaccination, regular screening, as well as early treatment of precancerous lesions. This gap in understanding may reduce their motivation to engage in effective preventive actions.

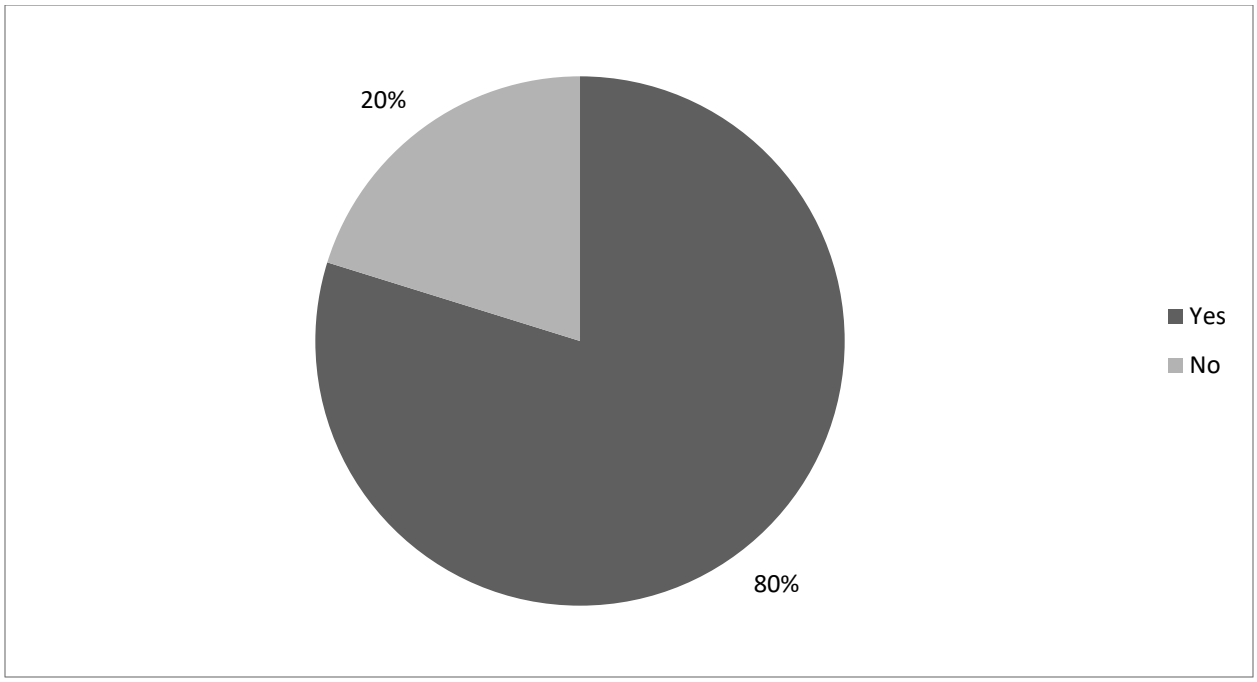


Figure 4.6: Awareness of whether cervical cancer can be prevented.

Source: Author (2025).

4.2.2.7. Knowledge of how cervical cancer can be prevented

To assess knowledge of how cervical cancer can be prevented, respondents were presented with a list of prevention and screening options, moreover, were allowed to select more than one method. Figure 4.7 indicates that the most frequently selected prevention method was Pap smear (39%), followed by avoiding multiple sexual partners (29%) and HPV vaccination (22%). Fewer respondents identified Visual Inspection with Acetic Acid (VIA) (18%) or early treatment of precancerous lesions (15%). Notably, 40% of participants reported not knowing any specific prevention method. Moreover, these results indicate that while some community members recognised a few prevention strategies, knowledge of key prevention measures, particularly HPV vaccination and VIA, remains limited. The large proportion of respondents who lacked knowledge of any prevention method reported the need for stronger community education on effective cervical cancer prevention.

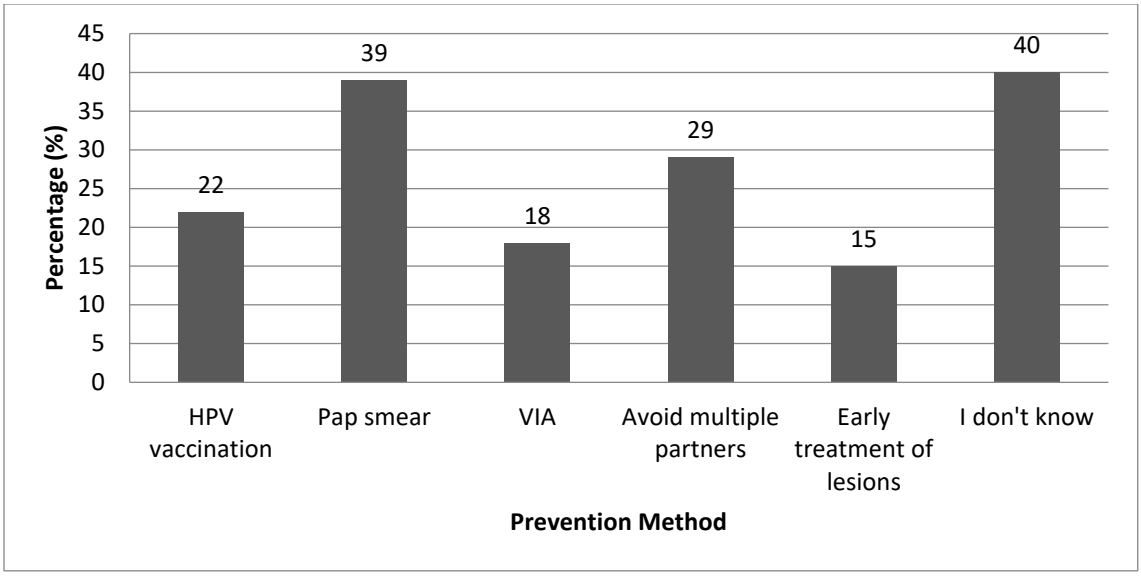


Figure 4.7: Knowledge of how cervical cancer can be prevented.

Source: Author (2025).

4.2.3. Overall knowledge levels towards cervical cancer prevention

To determine overall knowledge levels, individual responses from the knowledge statements were scored and totaled. Furthermore, each correct response was awarded one point, while incorrect or "do not know" responses received zero points. The total scores were converted into percentages and classified into three categories: poor knowledge (<50%), moderate knowledge (50–74%), and good knowledge (≥75%). The distribution of respondents across these categories is presented in Figure 4.8. The results indicate that most participants demonstrated a moderate level of knowledge about cervical cancer prevention. Overall, 62.7% (143) of respondents resorted within the moderate category, while 34.7% (79) displayed good knowledge. Only a very small proportion, 2.6%, had poor knowledge. Importantly, these findings suggest that while general awareness of cervical cancer exists among most participants, many still lack a deep understanding of its causes, risk factors, and preventive measures. The relatively high proportion of respondents with moderate knowledge indicates that information on cervical cancer is reaching communities; however, there remain notable gaps in comprehensive understanding, particularly concerning HPV infection and screening guidelines.

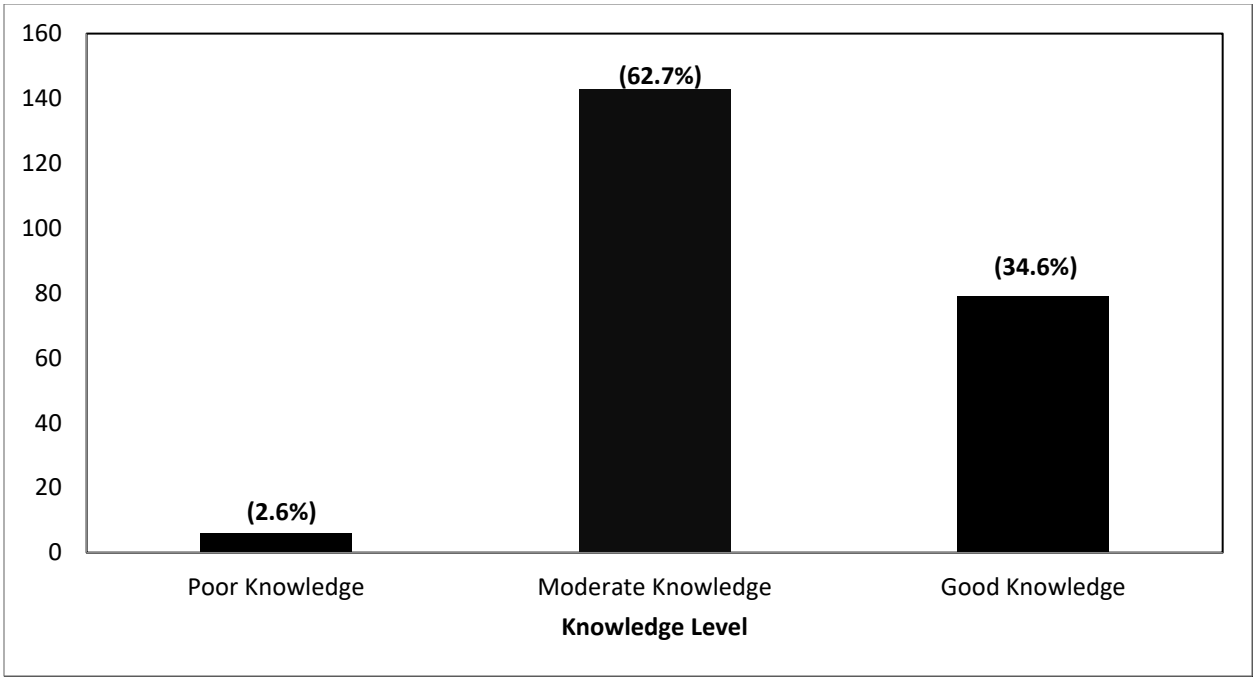


Figure 4.8: Overall knowledge levels toward cervical cancer prevention among respondents

Source: Author (2025).

4.2.4. Factors associated with knowledge

To identify factors associated with respondents' knowledge of cervical cancer prevention, bivariate and multivariate logistic regression analyses were conducted. Crude odds ratios (COR) were first estimated for each variable, and significant predictors were subsequently included in the multivariate model to obtain adjusted odds ratios (AOR) with 95% confidence intervals. Table 4.2 presents the logistic regression results for the key socio-demographic variables.

Table 4.2: Logistic regression model for knowledge about cervical cancer

Predictor variables	Categories	COR (95% CI)	P-value	AOR (95% CI)	P-value
Age (ref: 18-24)	25-34	1.127 (0.569 - 2.231)	0.137 0.732		
	35-44	0.522 (0.233 - 1.166)	0.113		
	45-59	0.439 (0.134 - 1.44)	0.175		
Gender (ref: Male)	Female	0.999 (0.537 - 1.861)	0.999		

			<0.001		0.008
Education (ref: Primary/Illiterate)	Secondary	2.609 (0.733 - 9.28)	0.139	1.203 (0.294 - 4.93)	0.797
	Tertiary	9.07 (2.564 - 32.086)	0.001	3.479 (1.015 - 14.688)	0.045
Employment status (ref: Unemployed)	Employed/Self-employed	0.763 (0.421 - 1.382)	0.372		
Region (ref: Ohangwena)	Kavango West	6.174 (2.126 - 17.929)	0.001	8.969 (2.754 - 29.214)	<0.001
Residence (ref: Rural/village)	Urban	4.11 (2.213 - 7.632)		2.547 (1.266 - 5.125)	0.009
Distance to district hospital (ref: 6-10 km)	Less than 5km	5.15 (2.392 - 11.09)	<0.001		
Marital status (ref: Single)	Ever married	0.897 (0.378 - 2.129)	0.805		
Contraceptive usage (ref: No)	Yes	1.111 (0.52 - 2.373)	0.786		
	0		<0.001		0.001
Number of children (ref: 0)	1 - 5	0.333 (0.176 - 0.631)	0.001	0.354 (0.167 - 0.75)	<0.001
	6 and above	0.049 (0.006 - 0.392)	0.004	0.112 (0.012 - 1.067)	<0.001
HIV testing (ref: No)	HIV testing	1.204 (0.123 - 11.785)	0.873		
	1		0.002		
Number of sources of health information (ref: 1 source)	2	1.28 (0.644 - 2.545)	0.482		
	3	3.93 (1.850 - 8.347)	<0.001		
Religious group (ref: Muslim/Others)	Christian	0.932 (0.504 - 1.724)	0.822		

AOR: Adjusted odds ratio; COR: Crude odds ratio; 95% CI: 95% confidence interval

Source: Author (2025).

As presented in Table 4.2, the regression analysis identified education level, region, and place of residence as the strongest predictors of knowledge about cervical cancer prevention. This means that a person's educational background and where they live significantly influence how much they know about cervical cancer and its prevention. Furthermore, respondents with tertiary education were 3.5 times more likely to demonstrate good knowledge compared to those with only primary or no formal education (AOR =

3.479; 95% CI: 1.015–14.688; p = 0.045). This suggests that higher education enhances awareness and understanding of health-related issues, possibly because more educated individuals are better equipped to access and interpret health information.

Respondents living in urban areas had higher odds of good knowledge compared to those in rural settings (AOR = 2.547; 95% CI: 1.266-5.125; p = 0.009). This likely reflects differences in access to health information and services, as people in towns are more exposed to media campaigns, health facilities, as well as educational programmes than those in remote villages.

Notably, gender did not significantly influence knowledge (AOR = 0.999; 95% CI: 0.537-1.861; p = 0.999), indicating that both men and women in the study areas had similar levels of understanding about cervical cancer. This could reflect shared information within households or community settings, where both sexes learn about health issues through similar sources such as radio or community meetings.

Interestingly, participants with fewer children (1-5) were less likely to have good knowledge compared to those without children (AOR = 0.354; 95% CI: 0.167-0.750; p < 0.001). This finding may suggest that women without children have more time or interest in learning about preventive health measures, or that reproductive responsibilities and household duties reduce opportunities for mothers to engage in health education activities. Other factors, including employment status, marital status, contraceptive use, HIV testing, and religion, were not significant predictors. This suggests that these factors did not significantly influence how much respondents knew about cervical cancer prevention in this study population.

4.3. Attitudes towards cervical cancer prevention

4.3.1. Attitude on cervical cancer prevention among respondents.

Table 4.3 presents respondents' attitudes toward cervical cancer prevention and screening. Attitudes were assessed using eight statements, each measured on a five-point Likert scale, ranging from "Strongly Disagree" (1) to "Strongly Agree" (5). The statements explored perceptions of disease risk, prevention, the importance of screening, and social or cultural influences related to cervical cancer.

Table 4.3 Attitude on cervical cancer prevention among respondents.

Statement	Total (N)	Strongly disagree n(%)	Disagree n(%)	Neutral n(%)	Agree n(%)	Strongly agree n(%)
All women have an equal chance of developing cervical cancer	228	10 (4.4)	38 (16.7)	12 (5.3)	***111 (48.7)***	57 (25)
Cervical cancer can be detected early by screening	221	2 (0.9)	10 (4.5)	8 (3.6)	***139 (62.9)***	62 (28.1)
Cervical cancer screening causes no harm to women	225	22 (9.8)	65 (28.9)	16 (7.1)	***82 (36.4)***	40 (17.8)
It is essential to consult a doctor if there is bleeding between periods	220	5 (2.3)	2 (0.9)	6 (2.7)	***127 (57.7)***	80 (36.4)

HPV vaccination can prevent cervical cancer	207	13 (6.3)	9 (4.3)	48 (23.2)	***97 (46.9)***	40 (13)
All women who develop cervical cancer must have their wombs removed	222	***58 (26.1)***	56 (25.2)	35 (15.8)	41 (18.5)	32 (14.4)
Cervical cancer would threaten a relationship with a sexual partner	224	34 (15.2)	45 (20.1)	29 (12.9)	***65 (29)***	51 (22.8)
I prefer a female health worker to conduct a cervical examination	225	28 (12.4)	25 (11.1)	26 (11.6)	***84 (37.3)***	62 (27.6)

Source: Author (2025).

Overall, the findings indicate that respondents generally hold positive attitudes toward cervical cancer prevention, although some misconceptions and areas of uncertainty remain. Most participants concurred that all women have an equal chance of developing cervical cancer, with 73.7% selecting agree or strongly agree. This suggests that respondents recognise cervical cancer as a universal risk rather than a condition affecting only certain groups. A large majority (91.0%) agreed that cervical cancer can be detected early through screening, indicating strong awareness of the importance of screening and its benefits for early detection. In addition, attitudes toward the safety of cervical cancer screening were more diverse. Only 54.2% concurred that screening causes no harm, while 38.7% disagreed. This suggests lingering concerns about discomfort, pain, or side effects, which may influence screening uptake.

Furthermore, there was strong agreement (94.1%) with the statement that it is essential to consult a doctor if there is bleeding between periods, reflecting recognition of abnormal vaginal bleeding as a warning sign requiring medical attention. Attitudes toward HPV vaccination were generally positive, with 59.9% agreeing that it can prevent cervical cancer. However, 23.2% remained neutral, indicating that knowledge of HPV vaccination may not be fully established. Misconceptions were evident in responses to the statement that all women with cervical cancer must have their wombs removed, where 51.3% disagreed but 32.9% agreed. This diverse pattern indicates continuing misinformation regarding treatment options, which may fuel fear and stigma.

Attitudes toward the potential social impact of cervical cancer were also divided. About 51.8% of participants concurred that cervical cancer could threaten a relationship with a sexual partner, while 35.3% disagreed. This suggests that social stigma and fear of relationship strain may influence women's willingness to seek screening or disclose symptoms. Finally, most respondents (64.9%) preferred a female health worker for cervical examinations, reflecting gender-related preferences that may affect comfort and uptake of screening services. This has clear implications for service delivery, particularly in rural settings.

4.3.2. Predictors of Attitudes Toward Cervical Cancer Prevention

To identify factors associated with respondents' attitudes toward cervical cancer prevention, bivariate and multivariate logistic regression analyses were conducted. Crude odds ratios (COR) were first estimated for each independent variable, and those indicating potential association were entered into a multivariate model to obtain adjusted odds ratios (AOR) with 95% confidence intervals. Only 109 respondents were included in this analysis because this subset represented participants who had fully completed the attitude-related section of the questionnaire. Moreover, several participants did not respond to all items in this section, particularly those that required personal opinions or previous experience with screening, resulting in missing data. To maintain the validity of the model, only complete responses were included in the final analysis.

Table 4.4: Logistic regression model for attitude towards cervical cancer (n = 109)

Predictor variables	Categories	COR (95% CI)	P-value	AOR (95% CI)	P-value
Age (ref: 18-24)			0.3224		0.920
	25-34	3.636 (0.646 - 20.457)	0.143	1.651 (0.176 - 15.473)	0.661
	35-44	3.864 (0.688 - 21.691)	0.1247	0.741 (0.03 - 18.175)	0.8546
	45-59	2.5 (0.259 - 24.096)	0.428	0.224 (0 - 459.599)	0.7003
Gender (ref: Male)	Female	0.547 (0.148 - 2.019)	0.3652	0.118 (0.004 - 3.228)	0.2056
Education (ref: Primary/Illiterate)			0.303		0.474
	Secondary	0.323 (0.037 - 2.814)	0.3064	0.805 (0.035 - 18.646)	0.892
	Tertiary	0.974 (0.083 - 11.435)	0.9831	3.435 (0.058 - 202.916)	0.553
Employment status (ref: Unemployed)	Employed/self-employed	1.867 (0.456 - 7.641)	0.3854	0.559 (0.058 - 5.348)	0.6137
Region (ref: Ohangwena)	Kavango West	1.25 (0.34 - 4.593)	0.7368	0.169 (0.009 - 3.219)	0.237
Residence (ref: Rural/village)	Urban	0.868 (0.236 - 3.188)	0.831	0.484 (0.047 - 5.024)	0.544
Distance to district hospital (ref: 6-10 km)	less than 5km	0.632 (0.154 - 2.591)	0.524	0.663 (0.07 - 6.258)	0.7195
Marital status (ref: Single)	Ever married	1.36 (0.159 - 11.641)	0.7787	1.172 (0.039 - 35.639)	0.9273
Contraceptive usage (ref: No)	Yes	1.297 (0.252 - 6.681)	0.7559	0.101 (0.007 - 1.539)	0.0989
Number of children (ref: 0)	0		0.2715		0.082
	1 - 5	3.05 (0.756 - 12.303)	0.1171	24.142 (1.441 - 404.377)	**0.027**
	6 and above	2.6 (0.274 - 24.648)	0.405	96.769 (0.034 - 274716.624)	0.260
HIV testing (ref: No)	HIV testing(1)	10.889 (0.627 - 189.119)	0.1011	256.805 (1.522 - 43334.041)	**0.034**
Number of sources of health information (ref: 1 source)	1.00		0.7482		0.2622
	2.00	1.738 (0.419 - 7.2)	0.4462	5.988 (0.702 - 51.085)	0.1018
Religious group (ref: Muslim/Others)	Christian	0.548 (0.11 - 2.734)	0.4636	0.117 (0.008 - 1.776)	0.1222

AOR: Adjusted odds ratio; COR: Crude odds ratio; 95% CI: 95% confidence interval.

As presented in Table 4.4, overall, HIV testing and the number of children emerged as the strongest predictors of positive attitudes toward cervical cancer prevention. Moreover, respondents who had ever been tested for HIV were 257 times more likely to express a positive attitude toward cervical cancer prevention compared to those who had never been tested (AOR = 256.805; 95% CI: 1.522–43,334.041; p = 0.034). Similarly, participants with 1–5 children were 24 times more likely to demonstrate a positive attitude compared to those with no children (AOR = 24.142; 95% CI: 1.441–404.377; p = 0.027). Other variables, including age, gender, education level, employment status, region, and residence, were not significantly associated with attitudes in the adjusted model. Although contraceptive use and multiple sources of health information appeared to improve the likelihood of positive attitudes, their influence did not reach statistical significance. Importantly, these findings suggest that contact with the health system, particularly through HIV testing and maternal health services, strengthens positive attitudes toward cervical cancer prevention. Women who engage more frequently with healthcare providers through HIV programs or child-related visits are more likely to value and support preventive actions such as cervical cancer screening.

4.4. Practice of cervical cancer screening

4.4.1. Women who have been screened for cervical cancer

Screening practice was assessed by questioning female respondents whether they had ever undergone cervical cancer screening. Figure 4.9 presents the distribution of women who reported having been screened. only 59 women (37%) had ever been screened for cervical cancer, while the majority, 99 women (63%), had never been screened. These findings indicate that screening uptake remains low in the study population, suggesting limited engagement with available preventive services, moreover highlighting a gap between awareness of the disease and actual screening behaviour.

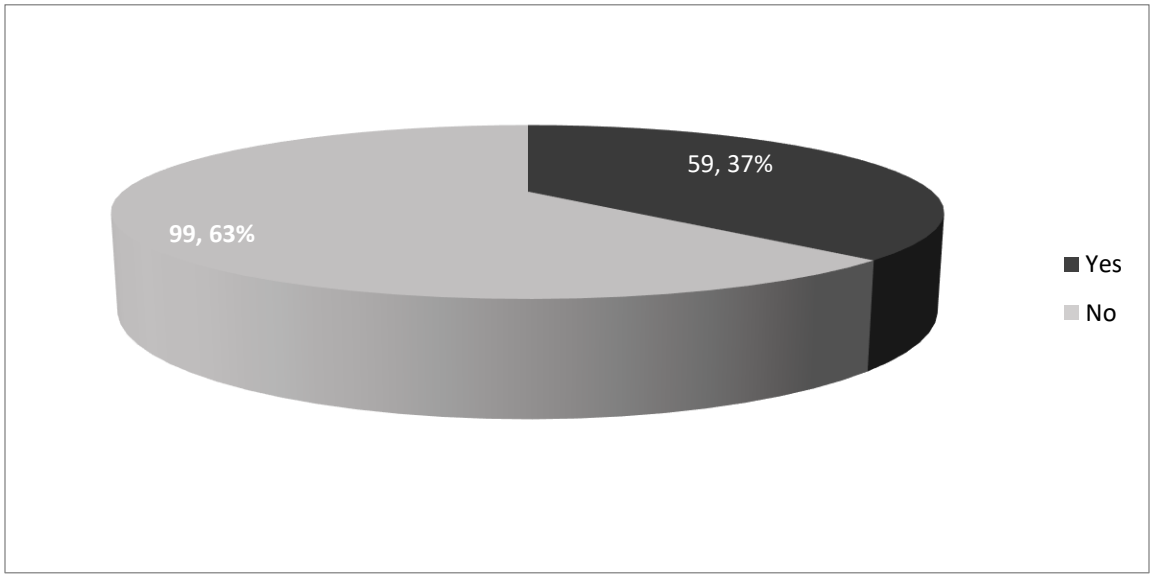


Figure 4.9: Distribution of women who have been screened for cervical cancer

Source: Author (2025).

4.4.2. Men who supported a woman to screen for cervical cancer

In addition to assessing women's practices, the study also explored the involvement of men in supporting cervical cancer prevention initiatives. Male participants (n = 70) were questioned whether they had ever supported a woman to undergo cervical cancer screening. Figure 4.10 presents their responses. As illustrated in Figure 4.9, 28 men (40%) indicated that they had supported a woman to screen for cervical cancer, whereas 42 men (60%) reported that they had not. This indicates that while some men are engaged in supporting preventive health actions, male involvement in cervical cancer screening remains limited.

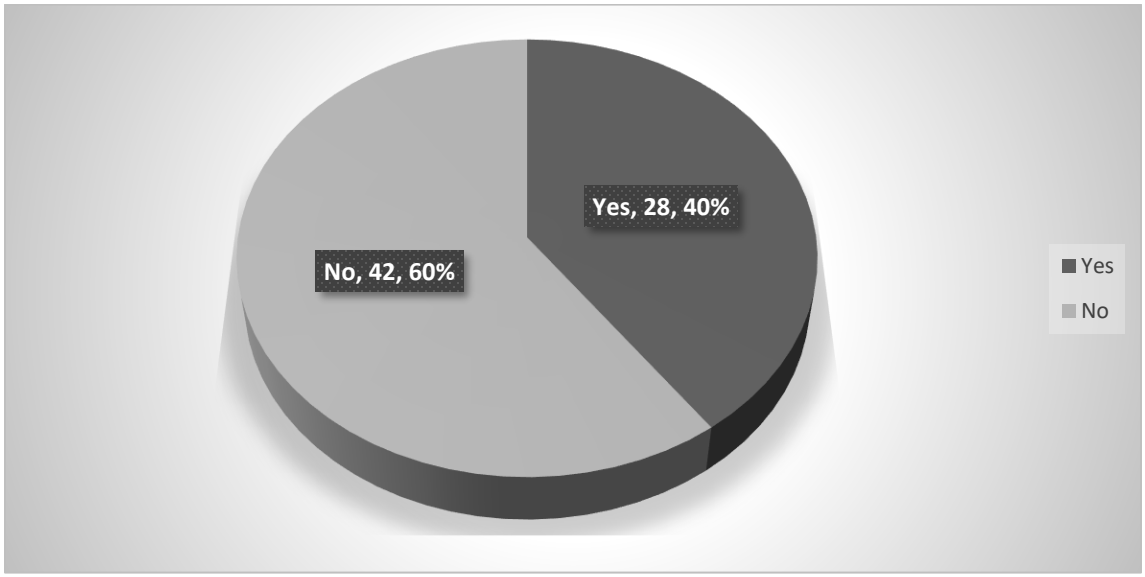


Figure 4.10: Distribution of male respondents who reported supporting a woman to undergo cervical cancer screening.

Source: Author (2025).

4.4.3. HPV vaccination uptake among women

Respondents were also questioned whether they had ever received the HPV vaccination as a preventive measure against cervical cancer. Figure 4.11 illustrates that, out of 158 participants, only 8 women (5.1%) reported having received the HPV vaccine, while an overwhelming 150 women (94.9%) indicated that they had not been vaccinated. This strikingly low vaccination rate indicates a critical gap in HPV prevention coverage within the study population. Moreover, the finding reflects limited access to the HPV vaccine in Namibia's public health facilities, as the vaccine is currently only available in select private institutions. It also points to persistent impediments such as a lack of awareness, affordability issues, as well as the absence of a national vaccination programme targeting eligible girls and women.

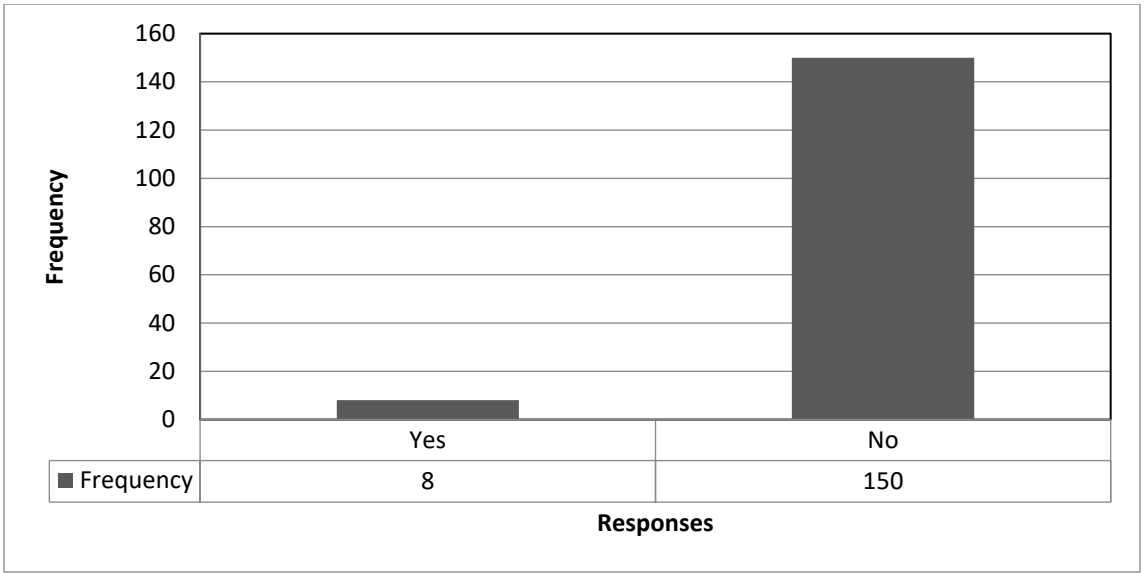


Figure 4.11: Distribution of respondents who have received HPV vaccination.

Source: Author (2025).

4.4.4. Unscreened women's intention to undergo cervical cancer screening in the future

Female respondents who were never screened were questioned whether they intended to undergo cervical cancer screening in the future. As illustrated in Figure 4.12, respondents (71%) expressed willingness to undergo cervical cancer screening in the future, while 24% did not. This finding reflects a generally positive outlook toward cervical cancer prevention, suggesting that most participants recognised the importance of screening for early detection. However, the proportion of those unwilling to be screened remains concerning, as it may reflect persistent impediments such as fear of diagnosis, misconceptions, or limited accessibility of screening services.

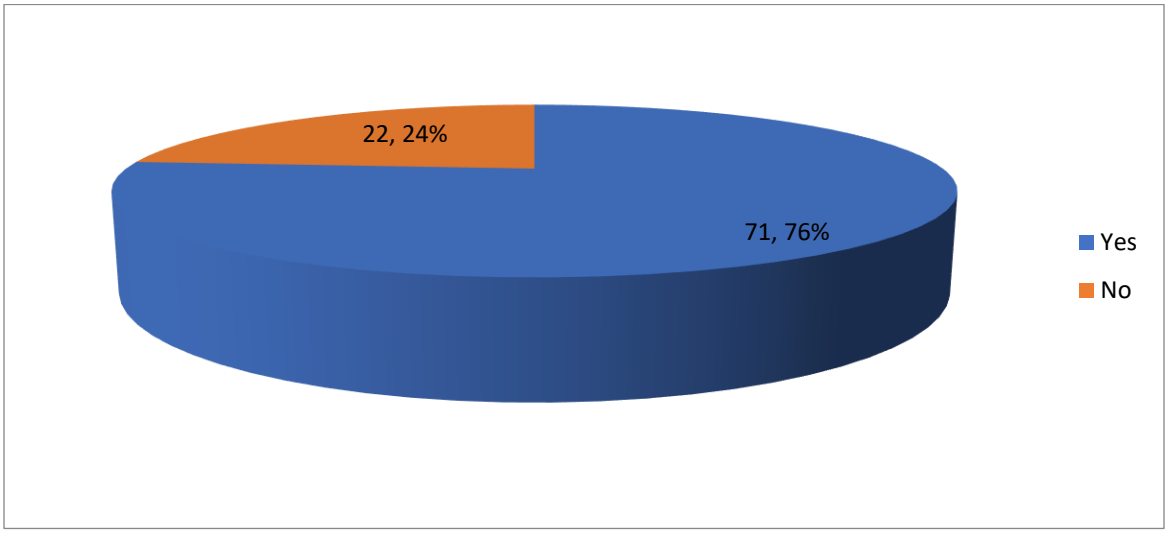


Figure 4.12: respondents' intention to undergo cervical cancer screening in the future.

Source: Author (2025).

4.4.5. Predictors of Cervical Cancer Prevention Practices

To identify factors associated with respondents' practices toward cervical cancer prevention, both bivariate and multivariate logistic regression analyses were conducted. Crude odds ratios (COR) were first estimated for each independent variable, and those that indicated potential association were entered into a multivariate model to obtain adjusted odds ratios (AOR) with 95% confidence intervals. As presented in Table 4.5 below, after adjusting for possible confounding factors, employment status remained the only statistically significant predictor of good practice toward cervical cancer prevention (AOR = 2.340; 95% CI: 1.026–5.336; p = 0.043). This indicates that employed or self-employed participants were more than twice as likely to have undergone screening or to have encouraged others to screen compared to those who were unemployed.

Although marital status approached significance (AOR = 2.526; p = 0.060), the relationship did not meet the statistical threshold for significance. However, the trend suggests that ever-married individuals may have greater exposure to reproductive health services, possibly explaining their higher likelihood of screening. Moreover, participants aged 35-44 years and 45-59 years also demonstrated higher odds of screening at the bivariate level (COR = 4.571 and 4.876, respectively; $p < 0.01$), however these associations lost significance in the adjusted model. This pattern suggests that age alone may not be a reliable predictor of screening behaviour once other variables, such as employment and education, are controlled for.

Similarly, while tertiary education was associated with increased odds of good screening practice (AOR = 3.714; p = 0.100), the relationship was not statistically significant. Other variables, including gender, region, residence, number of children, contraceptive use, and HIV testing, did not indicate significant associations in the final model. More importantly, these findings suggest that economic empowerment and consistent engagement in structured employment may fullfill a pivotal function in improving cervical cancer prevention practices. Furthermore, employed individuals often have better access to health insurance, workplace health information, as well as financial resources to seek preventive services. Finally, strengthening workplace-based health education and screening initiatives could therefore serve as an effective strategy for increasing screening uptake in Namibia's adult population.

Table 4.5: Logistic regression model for practice towards cervical cancer (n = 228)

Predictor variables	Categories	COR (95% CI)	P-value	AOR (95% CI)	P-value
Age (ref: 18-24)			**0.003**		0.209
	25-34	1.688 (0.625 - 4.561)	0.302	0.876 (0.284 - 2.697)	0.817
	35-44	4.571 (1.773 - 11.786)	**0.0017**	2.299 (0.692 - 7.643)	0.1742
	45-59	4.876 (1.529 - 15.551)	**0.0074**	2.85 (0.544 - 14.929)	0.2152
Gender (ref: Male)	Female	0.91 (0.456 - 1.813)	0.7877	1.185 (0.516 - 2.722)	0.6892
Education (ref: Primary/Illiterate)			0.7285		0.167
	Secondary	1.053 (0.388 - 2.86)	0.919	1.853 (0.463 - 7.417)	0.383
	Tertiary	1.357 (0.488 - 3.773)	0.5583	3.714 (0.778 - 17.737)	0.100
Employment status (ref: Unemployed)	Employed/self-employed	4.004 (2.034 - 7.884)	**0.0001**	2.34 (1.026 - 5.336)	**0.0433**
Region (ref: Ohangwena)	Kavango West	1.061 (0.486 - 2.314)	0.882	0.834 (0.333 - 2.087)	0.698
Residence (ref: Rural/village)	Urban	0.709 (0.37 - 1.358)	0.2995	0.644 (0.265 - 1.57)	0.334
Distance to district hospital (ref: 6-10 km)	less than 5km	0.786 (0.408 - 1.516)	0.4723	0.977 (0.399 - 2.392)	0.9599
Marital status (ref: Single)	Ever married	3.756 (1.67 - 8.45)	**0.0014**	2.526 (0.963 - 6.627)	0.0597
Contraceptive usage (ref: No)	Yes	2.043 (0.755 - 5.533)	0.1598	0.922 (0.292 - 2.914)	0.8906
Number of children (ref: 0)	0		0.0566		0.413
	1 - 5	3.346 (1.244 - 9.002)	**0.0168**	2.188 (0.667 - 7.182)	0.197
	6 and above	3.059 (0.789 - 11.86)	0.1059	1.606 (0.229 - 11.28)	0.634
HIV testing (ref: No)	HIV testing(1)	421818913.622 (0 - 0)	0.9992	171716217.819 (0 - 0)	0.9992
Number of sources of health information (ref: 1 source)	1.00		0.2516		0.2797
	2.00	1.085 (0.507 - 2.321)	0.8332	1.389 (0.589 - 3.274)	0.4526
	3.00	-	-	2.175 (0.826 - 5.728)	0.1156
Religious group (ref: Muslim/Others)	Christian	0.826 (0.418 - 1.632)	0.5823	0.926 (0.409 - 2.097)	0.8542

AOR: Adjusted odds ratio; COR: Crude odds ratio; 95% CI: 95% confidence interval

4.4.6. Overall score of knowledge, attitude, and practices towards cervical cancer prevention.

Figure 4.13 compares respondents' overall levels of knowledge, attitudes, and practices toward cervical cancer prevention. Each bar represents the percentage distribution within the respective KAP component.

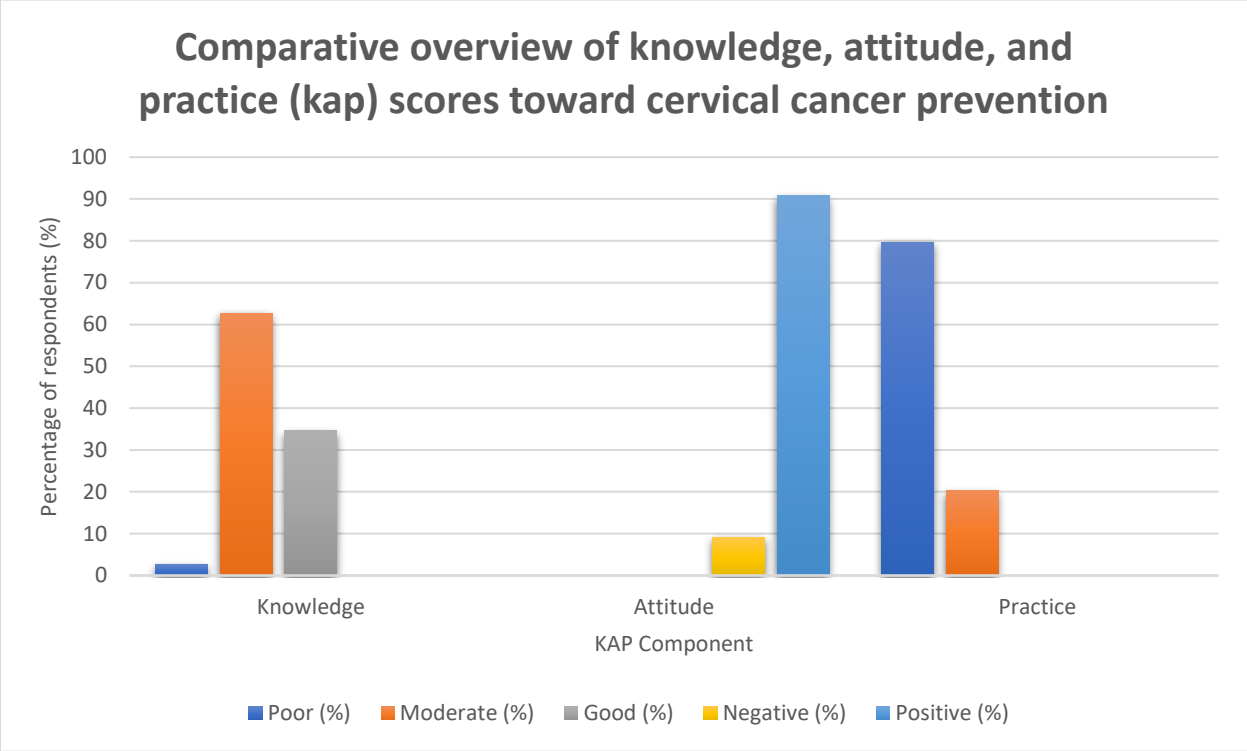


Figure 4.13: Comparative overview of knowledge, attitude, and practice scores toward cervical cancer prevention

Source: Author (2025).

The clustered chart above presents a comparative overview of respondents' knowledge, attitudes, and practices (KAP) scores regarding cervical cancer prevention. Moreover, the results reveal that most respondents demonstrated moderate knowledge (62.5%), followed by good knowledge (35%), while only a small proportion (2.5%) exhibited poor knowledge. This suggests that awareness of cervical cancer exists; however, it remains limited in depth and accuracy, indicating the need for continuous community sensitisation.

In terms of attitude, an overwhelming majority (91%) of participants reported a positive attitude toward cervical cancer prevention, while 9% expressed negative perceptions. This indicates a general willingness of community members to support preventive measures, provided that services and information are accessible. However, the pattern for practice was less encouraging. Despite positive attitudes, 80% of respondents demonstrated poor preventive practices, while only 20% reported good practice behaviours such as attending screening or encouraging others to do so. This indicates a significant gap between awareness and action, suggesting that barriers such as limited service access, fear, stigma, and systemic

inefficiencies may impede translation of knowledge and attitudes into preventive behaviour. Overall, the results indicate that while knowledge and attitudes toward cervical cancer prevention are moderately strong, actual preventive practices remain weak. Strengthening education, improving service accessibility, as well as addressing socio-cultural barriers are imperative to close this knowledge-practice gap in rural Namibia.

4.4.7. Relationship between knowledge, attitude, and practice

Fisher's Exact Test was employed to assess the relationships among knowledge, attitude, and practice scores because the data did not meet the assumptions required for the Chi-square test. As illustrated in Table 4.6, all p-values were above 0.05, indicating no statistically significant associations among the three variables. This suggests that having good knowledge about cervical cancer did not necessarily lead to a positive attitude or effective prevention practices. Similarly, having a positive attitude does not always result in preventive actions.

Table 4.6: Test of associations between the three measures (Knowledge, attitude and practice)

Fisher's Exact Tests (p-value)		
	Knowledge	Attitude
Attitude	0.688	
Practice	0.209	0.675

Source: Author (2025).

4.5. Women's health-seeking behaviour (Phase II)

A total of 40 community members from the Ohangwena and Kavango West regions participated in the qualitative phase. Six focus group discussions (FGDs) were conducted across the two regions, with 6–8 participants per group. Data saturation was reached by the fifth FGD, as no new themes emerged, and this was confirmed during the sixth discussion. Two researchers were involved in the coding process, and coding consistency was enhanced through independent coding followed by comparison and consensus discussions to resolve discrepancies.

4.5.1. Socio-demographic characteristics of participants

A total of 40 community members from the Ohangwena and Kavango West regions participated. Most respondents were aged 30-39 years (40%), followed by those aged 40-49 years (47.5%), while only 12.5% were between 20-29 years old. This age distribution suggests that most participants were adults in their prime reproductive and economically active years, aligning with the age group most at risk for cervical cancer.

Moreover, in terms of educational attainment, 47.5% had completed secondary education, and 42.5% had primary or no formal education, while only 10% had attained tertiary-level education. This pattern

indicates limited higher education exposure among respondents, which may influence awareness and understanding of cervical cancer prevention. Regarding employment, 60% of respondents were unemployed, while 40% were employed or self-employed, highlighting economic vulnerability that may affect access to healthcare services. A majority (77.5%) were single, whereas 22.5% were married, a finding that may reflect the population structure in rural Namibia, where many individuals are either unmarried or live apart from their spouses due to economic reasons.

Concerning reproductive history, 65% of participants had 1-5 children, 25% had six or more, and 10% had no children. This suggests a high fertility pattern consistent with rural Namibian communities. Screening history revealed that only 45% of respondents had ever undergone cervical cancer screening, compared to 55% who had never been screened. This indicates a significant gap in the uptake of preventive services, despite growing awareness. The demographic characteristics of the participants are outlined in Table 4.4 below.

TABLE 4.7: Socio-demographic characteristics of participants (N= 40)

Variables	**Categories**	**n (%)**
Age (years)	18-29	5 (12.5)
	30-39	16 (40)
	40-49	19 (47.5)
Education	Primary/Illiterate	17 (42.5)
	Secondary	19 (47.5)
	Tertiary	4 (10.0)
Employment status	Unemployed	24 (60.0)
	Employed/self-employed	16 (40.0)
Marital status	Single	31 (77.5)
	Married	9 (22.5)
Number of children	None	4 (10.0)
	1–5	26 (65.0)
	6 and above	10 (25.0)
Screened	Yes	18 (45.0)
	No	22 (55.0)

Source: Author (2025).

4.5.2. Emerging themes and sub-themes

The study analysis revealed six themes and associated sub-themes, as outlined in Table 4.5. Moreover, these themes reflect the multidimensional nature of health-seeking behaviours among rural women as well as the sociocultural and systemic factors influencing their decisions. The direct quotes are presented according to the focus group discussion (FDG), by region (Ohangwena [OH] and Kavango West [KW]), and participant number (P).

TABLE 4.8: Outline of themes, sub-themes.

Theme	Sub-theme
1. Knowledge and awareness of cervical cancer	• Limited understanding of cervical cancer and its symptoms • Misconceptions and misinformation • Basic awareness of prevention
2. Barriers to cervical cancer screening	• Structural and logistical barriers • Service delivery and health system issues • Age and eligibility confusion
3. Health care experiences and alternatives	• Mixed perceptions of health workers • Use of traditional or spiritual healing alternatives
4. Autonomy and cultural influence	• Women's independence in decision-making • Cultural fears and stigma
5. Motivators for screening uptake	• Health worker encouragement • Self-motivation and perceived risk
6. Community and institutional support needs	• Need for local health education and outreach • Health promotion and material needs

Source: Author (2025).

4.5.2.1. Theme 1: Knowledge and Awareness of Cervical Cancer

4.5.2.1.1. Sub-theme 1.1: Limited understanding of cervical cancer and its symptoms

Even though 45% of the participants were screened for cervical cancer, about 70% of the participants demonstrated a limited or inaccurate understanding of cervical cancer symptoms. Moreover, while some vaguely associated the disease with genital wounds, others had never received any health education on the topic. Participants stated the following:

- "*No, not really. However, we suspect that wounds or sores in the private area might be a sign. However, we are not certain and would like more information" (FGD1, OH, P8).*

- *“I do not know much about cervical cancer, but I know it is dangerous.” (FGD4, KW, P29).*

The uncertainty revealed in participants' responses underscores a knowledge gap as well as the need for basic health education on cervical cancer.

- *“I have heard about it, but I am not sure what causes it.” (FGD2, OH, P12).*
- *“It sounds like something that happens to older women only, not people like us, young ones.” (FGD 3, OH, P19).*

4.5.2.1.2. Sub-theme 1.2: Misconceptions and misinformation

Several participants reported misinformation circulating in their communities. Moreover, cultural myths and rumours contributed to fear and avoidance of screening services. Moreover, several participants reported beliefs not grounded in scientific understanding, for example, the belief that screening procedures involve removing the womb, which discouraged participation, while others attributed transmission to uncircumcised men.

- *“There are rumours about the womb being removed during the screening procedure; that is why people do not want to go to the hospital for screening.” (FGD5, KW, P33).*

A participant stated:

- *“Some people say you can become barren after doing that test. It is terrifying, especially if you are not done having kids.” (FGD3, OH, P21).*

Conversely, several participants reported misinformation that cervical cancer screening is rooted in fear and cultural myths, perpetuating stigma, moreover deterring women from seeking assistance. A participant added the following:

- *“Some people in our village say that the tools used to screen women are not clean, and sometimes they cut you during the procedure, and it is very painful” (FGD1, OH, P6).*

4.5.2.1.1. Sub-theme 1.3: Basic awareness of prevention

A few participants demonstrated awareness of preventive methods, such as condom use; however, the understanding of how this relates to cervical cancer was vague. A participant indicated:

- *“Yes, as long as you are using a condom, I do not think you will get cervical cancer.” (FGD3, OH, P17).*
- *“I think it is caused by unprotected sex, so staying faithful to one partner can help prevent you from contracting the disease.”* (FGD2, OH, P16).

However, knowledge of HPV and vaccination was lacking, as reflected by some participants.

- *"I have never heard of HPV before. If there is a vaccine, why aren’t we receiving it here at the clinic? They tell us about screening for cancer in women, but not that one” (*FGD2, OH, P16).
- *"I just found out about HPV during this discussion. If the vaccine can protect us, everyone should be able to receive it, not only school-aged girls."* (FGD5, KW, P33).

- *"We do not know much about HPV. If the health workers are not going to tell us about it, how do we ask for a vaccine?"* (FGD4, KW, P31).

4.5.2.2. Theme 2: Barriers to Cervical Cancer Screening

4.5.2.2.1. Sub-theme 2.1: Structural and logistical barriers

Regarding impediments to screening, some participants reported that they were not screened because they could not afford the transportation costs to health facilities, particularly those living in inland areas, which made access to health services challenging. Furthermore, the inaccessibility of clinics due to distance or poor roads was noted as a limitation, which limited participants' ability to attend screenings regularly. Participants indicated the following:

- *"Some of us have to walk long distances from our homes because there are no taxis in our area, so sometimes you sit at home and wait until the sickness is gone"* (FGD3, OH, P24).
- *"It is far, and there is no regular transport in my village. If the mobile clinic does not come, we cannot go and most of the time the mobile clinics take months to visit."* (FGD4, KW, P26).

Participants also pointed out several structural challenges within the health facilities that rendered it challenging to access cervical cancer screening. These challenges included shortages of screening supplies, limited space, long queues, staff shortages, and irregular availability of services. Women explained that even when they managed to reach the clinic, they were often unable to receive screening due to these system-related limitations. Their experiences are reflected in the quotes below:

- **"***The nurse who does screening is not always there. If she is off or attending other patients, they tell us to return another day*.**"** (FGD3, KW, P19)
- **"***Our clinic is small and always full. You can sit the whole day and still go home without being helped***."** (FGD1, OH, P08)
- **"***Most of the time, they say the mobile clinic is coming, but it does not come regularly. We wait for months before services reach our area***."** (FGD4, KW, P27)

Even when women are motivated to screen, these structural barriers create delays and missed opportunities for early detection. Moreover, the findings suggest that improving infrastructure, ensuring consistent staffing, as well as strengthening outreach services are imperative to making cervical cancer prevention more accessible and reliable for women in both Ohangwena and Kavango West regions.

4.5.2.2.2. Sub-theme 2.2: Service delivery and health system issues

Overcrowding and long wait times during cervical cancer screening campaigns rendered some participants unattended, as well as discouraged future attempts. A participant stated:

- *"I tried attending a screening campaign when I visited one of my uncles in town, but the crowd was too big, we waited all day and went home without being seen."* (FGD2, OH, P11).

Conversely, participants also reported inconsistent service delivery, such as unavailable staff or poorly organised outreach visits for visual inspection with acetic acid (VIA), which further contributed to

dissatisfaction and loss of trust in the system. In several cases, screening services were not provided on scheduled days, leaving women uncertain about when to return.

- *"Sometimes they tell us the machine is not working, and one time I went there because the doctor referred me because my periods were not stopping. I was told to come back another day. They took my number and never called"* (FGD5, KW, P35).

Another participant added that such inconsistencies made her hesitant to return:

- *"You can go to the clinic and find the nurse is not there, or they say the materials are finished. You just waste transport." (FGD4, OH, P28)*

Similarly, others described missed outreach visits that had been previously announced:

- *"They said the team would come to our village, but we waited and no one came. Later, they said it was postponed." (FGD3, KW, P14)*

These experiences indicate the fragility of service organisation and reliability, where unpredictable service delivery discourages women from seeking or repeating screening. Furthermore, ensuring consistent availability of staff, functional equipment, moreover reliable outreach schedules could strengthen trust and continuity in cervical cancer prevention programmes.

4.5.2.2.3. Sub-theme 2.3: Age and eligibility confusion

Several participants were misinformed about the eligibility criteria based on age, leading to early disengagement.

- "*Sometimes, it is because of age restrictions. I was once told I was too young, so I never returned."* (FGD1, OH, P2).
- *"I heard that screening is only for women who already have children, so I didn't bother to ask again." (FGD3, KW, P2)*
- *"There is no clear message on who should go. Some say it is for young girls, others say it is for older women. It's confusing." (FGD2, OH, P5)*

This uncertainty reflects the lack of clear and consistent communication regarding the national screening guidelines. The mixed messages from health workers and community sources contributed to misconceptions about who qualifies for screening and at what age. Consequently, several participants postponed or avoided screening completely, believing they were ineligible at the time. These findings underscore the need for standardised information as well as age-appropriate health education that clarifies eligibility criteria, particularly for young and nulliparous women, to encourage timely participation in preventive services.

4.5.2.3. Theme 3: Health Care Experiences and Alternatives

4.5.2.3.1. Sub-theme 3.1: Mixed perceptions of health workers

While several participants expressed trust in healthcare workers, others described their encounters as discouraging and emotionally distressing. Many reported that health workers were unapproachable, disrespectful, or failed to maintain confidentiality, which eroded their confidence and willingness to return for services.

- *"Some nurses have unfriendly attitudes, shout, and do not maintain confidentiality. You know my sister, sometimes they treat you based on appearance and status, and they think you are pretending to be sick."* (FGD4, KW, P40)

Several women shared that these negative attitudes made them feel humiliated or unworthy of care.

- *"When I asked questions, the nurse ignored me and moved on to the next person. I felt embarrassed and discouraged."* (FGD2, OH, P16)
- *"If you go there looking poor, they don't take you seriously. But when you wear nice clothes, they speak softly."* (FGD3, OH, P19)
- *"Sometimes they gossip about patients after you leave. That's why many women fear going for screening."* (FGD4, KW, P31)

Participants also reported that some health workers lacked empathy when addressing sensitive issues like reproductive health.

- *"They don't understand how scared we are. Instead of comforting you, they make you feel ashamed for asking."* (FGD1, OH, P6)
- *"One nurse laughed and said I was wasting time worrying about cancer, that it's for older women. I left feeling worse."* (FGD5, KW, P23)

Although these negative experiences were not universal, they had a strong influence on women's trust, comfort, and future health-seeking behaviour**.** Those who encountered kind, patient nurses described feeling encouraged and more likely to return.

- *"The nurse who attended me spoke nicely and explained everything. That made me trust her and tell my friends to go too." (FGD2, OH, P8)*

For some participants, the fear of being judged or dismissed outweighed the perceived benefits of screening. The findings suggest that interpersonal interactions and communication styles within health facilities fullfills a crucial function in shaping women's attitudes toward cervical cancer prevention services.

4.5.2.3.2. Sub-theme 3.2: Use of traditional or spiritual healing alternatives

In the absence of trust in or access to formal health services, several participants reported turning to alternative sources of healing, such as churches and traditional healers. Moreover, these options were

often influenced by cultural norms, spiritual beliefs, as well as social networks, providing emotional comfort and a sense of community.

- *"Some people visit revival churches, others visit traditional healers for preventing diseases from getting worse."* (FGD5, KW, P36)

For many, these practices were not only familiar however also perceived as safer and more responsive to their needs compared to formal clinics.

- *"At church, the pastor prays for us and gives us holy water. It feels safer." (FGD3, OH, P23)*
- *"When you go to the prophet, he listens and encourages you, not like the nurses who rush you." (FGD4, KW, P25)*
- *"Our elders believe traditional herbs clean the womb. It is what we grew up knowing." (FGD1, OH, P12)*

However, reliance on traditional or spiritual healing was also shaped by negative experiences with the formal health system. Participants who felt dismissed or disrespected by health workers were more likely to seek care elsewhere.

- *"When they treat you badly at the clinic, you prefer to go to someone who listens to you. The traditional healer at least gives you time."* (FGD2, KW, P9)
- *"I once went for screening and the nurse shouted at me. Since then, I mostly just go to church when I am not feeling well."* (FGD3, OH, P16)

Conversely, a few participants acknowledged that traditional and medical systems could complement each other when guided by accurate information.

- *"I believe both can help. The doctor checks you, and the church prays for you. They work together if you have faith."* (FGD5, KW, P33)
- *"Sometimes the prophet tells us to go for tests first before prayer. That helps because we know what we are praying for."* (FGD2, OH, P17)

These perceptions demonstrate that traditional and spiritual approaches remain deeply rooted in community health-seeking behaviour. Furthermore, while they provide emotional reassurance and align with local beliefs, they can also delay biomedical screening and treatment, particularly when used as substitutes rather than supplements to medical care. These findings underscore the importance of culturally sensitive health education that respects local beliefs while promoting evidence-based prevention strategies. Collaboration between faith leaders, traditional healers, as well as healthcare providers could strengthen trust, bridge knowledge gaps, moreover encourage earlier screening among women in rural communities.

4.5.2.4. Theme 4: Autonomy and Cultural Influence

4.5.2.4.1. Sub-theme 4.1: Women's independence in decision making

Numerous participants expressed a growing sense of autonomy and confidence in making decisions related to their health, including whether to undergo cervical cancer screening. Furthermore, numerous

women described this independence as part of a broader shift toward self-awareness and empowerment in managing their well-being.

- *"The decision to seek health care is entirely ours because only we can make it ourselves."* (FGD1, OH, P4)
  "I decide for myself now. Before, I used to wait for my husband or my mother-in-law to tell me, but I realised it's my body." (FGD3, KW, P22)
- *"These days, we women are educated. We don't wait for anyone to say yes or no before we go to the clinic."* (FGD2, OH, P18)

This sense of independence reflects an encouraging trend where education, exposure to health information, as well as personal experiences have strengthened women's ability to make health-related decisions.

However, several participants acknowledged that male partners still hold significant influence, either explicitly through permission-seeking or implicitly through social expectations and fear of judgment.

- *"I make my own decisions about my health, but it is not easy. People talk, and they say a woman who goes for such tests without her husband's permission is disrespectful. Sometimes I keep quiet to avoid conflict."* (FGD4, KW, P30)
- *"If my husband refuses, I can't go. He will say I am listening to other people instead of him."* (FGD2, OH, P10)
  "Even if I want to go, my partner will ask many questions—why, who told you, what are they going to do to you?" (FGD5, KW, P28)

Conversely, some participants reported the positive role of supportive partners who encouraged screening and respected women's choices.

- *"My husband told me to go for the test. He even asked me what they said after the results. That gave me courage."* (FGD3, OH, P19)
- *"When men understand that it's about preventing disease, they support you. Mine always reminds me to go for check-ups."* (FGD4, KW, P25)

These diverse experiences reveal that women's independence in decision-making is shaped by a complex interplay of empowerment, cultural expectations, and partner dynamics. Moreover, while many women are increasingly asserting control over their health, lingering patriarchal norms continue to constrain full autonomy, particularly in rural settings where traditional gender roles remain influential. The findings underscore the importance of male engagement initiatives and couple-based education, which can foster mutual understanding, reduce stigma, as well as create an environment where women can make independent yet supported decisions about their health.

4.5.2.4.2. Sub-theme 4.2: Cultural fears and stigma

Cultural norms remained a major constraint to open conversations and preventive actions related to cervical cancer. Numerous participants expressed that the fear of judgment and gossip discouraged

women from seeking screening or discussing reproductive health issues publicly. Such fears were deeply rooted in patriarchal expectations and social taboos around women's sexuality.

- *"If someone hears you are being tested for cervical cancer, they may think you have been promiscuous. That kind of judgment stops many women from going, even when they want to."* (FGD2, OH, P10)
- *"Some people say that if you go for screening, it means you are already sick or have been unfaithful. That makes women afraid because they do not want to be talked about in the community."* (FGD4, KW, P28)
- *"Here, anything to do with private parts is not discussed. People just say, 'these things are shameful,' so we keep quiet."* (FGD1, OH, P7)

Several women reported being ridiculed or misunderstood for participating in screening programmes. This stigma often linked preventive care to sexual immorality or infidelity.

- *"When you go for screening, people start saying you have done something wrong or you are hiding something from your husband."* (FGD3, KW, P19)
- *"Some say that the nurses will see you naked, and that's not proper for a married woman. So even if you want to go, you fear what others will say."* (FGD2, OH, P11)

For others, the fear of conflict or mistrust from male partners was a strong deterrent.

- *"If you mention screening, he asks, 'Why? What have you been doing?' So, you keep quiet."* (FGD1, OH, P3)
- *"Men think if a woman goes for such a test, she has been with other men. That's why many women just ignore it."* (FGD4, KW, P21)

Despite these negative perceptions, a few participants noted that attitudes are slowly changing as communities gain more information through health education and peer influence.

- *"At first, people said bad things about screening, but now we hear it's to prevent cancer. Slowly, people are starting to understand."* (FGD3, OH, P20)
- *"When women see others going and coming back healthy, they also get encouraged."* (FGD5, KW, P27)

These findings indicate that stigma and cultural silence continue to limit women's participation in cervical cancer prevention. Misconceptions linking screening to sexual behaviour, combined with fear of social judgment, challenge open dialogue and timely healthcare seeking. However, the shift in perceptions driven by education and community role models suggests that consistent, culturally sensitive communication can help reduce stigma and foster a supportive environment in which women feel safe accessing preventive services.

4.5.2.5. Theme 5: Motivators for Screening Uptake

4.5.2.5.1. Sub-theme 5.1: Health worker encouragement

Healthcare professionals fulfilled a pivotal function in influencing women's decisions to undergo screening. Moreover, participants consistently cited recommendations from nurses during routine visits, such as antenatal care, postnatal consultations, or immunisation appointments, as crucial motivators. A respondent noted:

- *"The nurses recommended I go for screening."* (FGD5, KW, P35).

This encouragement from trusted health personnel enabled them to demystify the procedure and reduce anxiety about the outcome. It also reinforced that screening was a routine as well as a crucial aspect of women's health. A participant recalled:

- *"It was during a clinic visit when the nurse said we should all get checked. That pushed me to go."* (FGD2, OH, P14).

4.5.2.5.2. Sub-theme 5.2: Self-motivation and perceived risk

Beyond encouragement from health workers, several participants described being motivated by personal concern and a sense of responsibility for their own health. Moreover, several women explained that their decision to undergo screening stemmed from a growing awareness of the risks associated with cervical cancer and a desire to prevent illness before symptoms appeared.

- *"Some of us take the initiative because we want to know our cervical health status."* (FGD2, KW, P9)
- *"I wanted to check myself because I have seen what cancer can do to people. Prevention is better than treatment."* (FGD3, OH, P13)
- *"No one told me to go. I just decided it's better to be sure than to regret later."* (FGD1, OH, P6)

This proactive attitude reflected an increasing level of health consciousness among women, particularly those who had been exposed to health information through community talks or media. For some, the motivation arose from personal or family experiences with illness, which strengthened their conviction in the importance of early detection.

- *"My aunt died from cancer because it was found too late. That made me fear, so I went for the test."* (FGD5, KW, P24)
- *"After hearing about cervical cancer on the radio, I decided to go for screening even though I was not feeling sick."* (FGD2, OH, P19)

Several participants also mentioned that relationship dynamics and perceived partner behaviour influenced their decision to get screened, as they associated certain risks with sexual activity or trust within relationships.

- *"Nowadays, it is hard to trust a partner fully, so we decided to get screened just to be safe."* (FGD4, KW, P16)
  "I went because I wanted peace of mind. You never know what your partner is doing." (FGD1, OH, P9)

"Even if you are faithful, you can still get infected if your partner is not. That's why I went to check." (FGD3, KW, P20)

These findings suggest that self-motivation as well as perceived risk are significant internal drivers of screening uptake. Moreover, as women become more aware of cervical cancer and their vulnerability to it, they are increasingly making independent, informed decisions to protect their health. Strengthening access to accurate information and reinforcing positive health-seeking behaviour through community education can further empower women to sustain this proactive approach to prevention.

4.5.2.6. Theme 6: Community and Institutional Support Needs

4.5.2.6.1. Sub-theme 6.1: Need for local health education and outreach

Participants repeatedly reported the urgent need for stronger community awareness and education to improve knowledge and correct misconceptions about cervical cancer. Numerous women believed that limited access to information was a primary reason for the low screening uptake in their communities. Furthermore, they called for outreach programmes that reach people where they live, learn, and gather, rather than relying solely on facility-based education.

- *"They should give announcements via local radio to alert people."* (FGD3, OH, P20)
- *"They must come to the villages, not just town clinics. Many people here do not know about this disease."* (FGD5, KW, P38)
- *"Sometimes we only hear about cancer on the radio from other regions. We need information in our own language and area."* (FGD1, OH, P12)

Participants also suggested practical communication strategies that could make health messages more accessible and relevant. They recommended using local languages, trusted community figures, as well as familiar social spaces, such as schools, churches, and women's groups, to encourage open discussion about cervical cancer prevention.

- *"They should visit schools and teach young girls early before they start having children."* (FGD4, KW, P27)
- *"Church leaders can also talk about it, because people listen to them."* (FGD3, KW, P23)

In addition, participants reported the value of mobile outreach campaigns and community-based services, noting that distance to facilities and transportation costs often prevent women from accessing screening services.

- *"The clinic is too far. If the team comes here even once in a while, many women will go for screening."* (FGD1, OH, P10)
- *"They should bring mobile clinics like they do for HIV testing. That will help those of us in remote areas."* (FGD4, KW, P25)

These views demonstrate that effective communication and community outreach are imperative to increasing awareness and participation in screening. Health education initiatives that combine local language messaging, media engagement, as well as outreach through trusted community platforms could

help bridge the knowledge gap and reduce stigma. Strengthening partnerships between health workers, traditional leaders, as well as local radio stations would ensure that cervical cancer prevention becomes a community-wide conversation rather than a clinic-based initiative.

4.5.2.6.2. Sub-theme 6.2: Emotional support from family and community

Family encouragement, in particular from female relatives, was identified as a significant enabler of screening uptake. Moreover, several women noted that their sisters, mothers, or close friends motivated them to seek screening and offered reassurance during the process. A participant indicated:

- *"Their encouragement helps us through the process."* (FGD1, OH, P2).

Such social support eased fears and reduced stigma. In addition, sometimes, participants went in groups or accompanied one another to health facilities. A participant remarked:

- *"When someone you trust goes with you, it makes the whole thing less scary."* (FGD2, OH, P16).

4.5.2.6.3. Sub-theme 6.3: Health promotion and material needs

In addition to education and emotional support, participants expressed the need for practical resources to promote cervical health. These included hygiene items, free screening supplies, vaccinations, as well as modern preventive technologies. As one participant remarked:

- *"Modern preventive treatments, such as injections, would help because we have nothing right now."* (FGD3, OH, P20).

Lack of access to basic health materials was perceived as an impediment to both prevention and maintaining general reproductive health. Another added:

- *"Even soap or pads would make a difference. We are often told to be clean, but do not have what we need."* (FGD5, KW, P33).

4.6. Health Systems constraints for cervical cancer prevention (Phase III)

4.6.1. Socio-demographic characteristics of participants

A total of 11 participants participated in the study, comprising both healthcare providers and support staff involved in cervical cancer prevention. Most participants (54.6%) were aged 35 years or above, while 36.4% were between 30 and 35 years old, and only 9.0% were aged 18–29 years. Most participants were female (63.6%), reflecting the gender distribution typical of the health workforce in Namibia.

In terms of education, 63.6% held a bachelor's degree, while 18.2% had a Diploma, and another 18.2% possessed a Master's degree, suggesting that most participants were well-qualified professionals. Regarding occupation, the largest group was nurses (54.5%), followed by doctors (36.4%), and one health extension worker (9.0%), indicating the diverse professional backgrounds of those providing or supporting cervical cancer services. Most participants had considerable work experience, with 36.4% having more

than 10 years, 36.3% between 1-5 years, and 27.3% between 6-10 years, indicating a balanced blend of seasoned and early-career professionals. The employment distribution indicated that slightly more than half (54.5%) were employed by the government, while the remaining 45.5% worked for non-governmental organisations (NGOs), demonstrating the collaborative involvement of both the public and private sectors in cervical cancer prevention initiatives. The demographic characteristics of the participants are outlined in Table 4.6.

Table 4.9: Socio-demographic characteristics of participants (n=11).

Variables	Categories	n (%)
Age (years)	18–29	1 (9.0)
	30–35	4 (36.4)
	35+	6 (54.6)
Gender	Female	7 (63.6)
	Male	4 (36.4)
Education Level	Diploma	2 (18.2)
	Bachelor's degree	7 (63.6)
	Master's degree	2 (18.2)
Occupation	Doctors	4 (36.4)
	Nurses	6 (54.5)
	Health extension worker	1 (9.0)
Working Experience	1–5 years	4 (36.3)
	6–10 years	3 (27.3)
	More than 10 years	4 (36.4)
Employer	Government	6 (54.5)
	NGO	5 (45.5)

NGO, non-government organisation.

Source: Author (2025).

4.6.2. Emerging themes

The findings are structured into six main themes: service delivery, health workforce, health information, health financing, essential medical products and technology, and leadership and governance. The outline of themes, sub-themes, and key findings are presented in Table 4.7.

Table 4.10: Outline of themes, subthemes, and key findings.

Theme	Subtheme	Key Findings
1. Service Delivery	**1.1.Screening Services**	Clinics offer VIA and Pap smear screenings, but service interruptions occur due to shortages and logistical constraints, particularly in rural areas.
	1.2. HPV Vaccine Accessibility	HPV vaccines are primarily available in the private sector, with limited access to public health facilities.

Theme	Subtheme	Key Findings
1. **Service Delivery**	**1.3. Community Outreach**	Outreach efforts are mainly clinic-based, with occasional campaigns coordinated with community leaders. Resource and transportation challenges affect coverage.
2.Health Workforce	**2.1. Staff Shortages and Retention**	High turnover rates among healthcare workers, especially young professionals. Rural postings and lack of incentives contribute to retention challenges. A heavy reliance on NGO-funded positions raises concerns about sustainability.
	2.2. Training and Specialisation	Few healthcare workers receive specialised training in cervical cancer screening. There is a shortage of gynecologists and oncologists.
3. Health Information	**3.1. Data Collection and Management**	Data collection is mostly manual, with limited use of electronic systems. Some districts have basic digital systems, but connectivity and equipment limitations pose challenges.
4. Health Financing	**4.1. Budget Constraints**	No dedicated government budget for cervical cancer prevention. Services rely heavily on NGO funding, raising concerns about long-term sustainability.
	4.2. Resource Allocation	Funding limitations affect outreach transportation and the availability of essential supplies, reducing the programmes's effectiveness.
5. Essential Products, Vaccines, and Technology	**5.1. Supplies for Screening Services**	Frequent shortages of VIA and Pap smear kits disrupt service delivery. HPV vaccines are largely unavailable in public facilities.
	5.2. Equipment and Infrastructure	The screening equipment is outdated, and the storage facilities are inadequate. Basic infrastructure, such as examination beds, needs improvement to meet patient needs.
6. Leadership and Governance	**6.1. Prevention Policy**	Leadership oversight is present, but strategic support is insufficient. Governance relies heavily on NGO funding due to the lack of a dedicated cervical cancer policy.
	6.2. Community Involvement	Collaboration with community leaders is inconsistent. There is a lack of local advocates for cervical cancer awareness, and cultural stigma remains a barrier to screening.

VIA, Visual inspection with acetic acid.
HPV, Human papillomavirus.
NGO, non-governmental organisation
Source: Author (2025).

4.6.2.1. Theme 1: Service Delivery

High-quality service delivery ensures that personal and non-personal health interventions are safe, effective, and accessible to those in need at the right time and place (World Health Organisation (WHO), 2007). This theme highlights the inadequate access to and inconsistency in screening, vaccination, and community outreach services.

4.6.2.1.1. Sub-theme 1.1: Cervical cancer screening services

Cervical cancer screening services, including VIA and Pap smear tests, are offered at all district hospitals; however, they are not available at the clinics. However, despite their availability on paper, these services are often inconsistently delivered due to logistical and human resource challenges.

- *"There are times we have to cancel trips to clinics because there is no car, even if the booking was made way earlier."* [P-1]

The shortage of trained and dedicated screening staff was repeatedly identified as a major constraint. Moreover, participants explained that when the only trained nurse or focal person was absent, screening activities were paused indefinitely. This not only created service gaps, but also discouraged women who made long trips to access screening.

- *"I am the only CECAP nurse here, and if I go on leave, then there is no one to screen, so patients should wait for me to come back."* [P-4]
- *"Sometimes, people come from far, but when they arrive, there is no one trained to do VIA, so they go back without being helped."* [P-2]

In addition to staff shortages, participants cited transportation and equipment challenges as recurring impediments to consistent service delivery, especially for outreach activities.

- *"It's supposed to be in all clinics, but sometimes, due to staff and equipment shortage, you find some of the clinics stopped somewhere."* [P-6]
- *"Sometimes the acetic acid is finished, or the light is not working, so we postpone the outreach screening until we get supplies."* [P-5]

These operational challenges result in irregular outreach schedules, long waiting periods, as well as missed opportunities for early detection. The inconsistency in service delivery undermines the continuity of care and limits community confidence in cervical cancer prevention programmes.

Despite these difficulties, a few participants acknowledged that where screening services were active, community demand and participation were encouraging.

- *"When we manage to go out, the turnout is good. Women want the service, but the challenge is sustaining it."* [P-7]

This demonstrates that while awareness and willingness to participate are growing among women, system-level barriers, including inadequate staffing, poor logistics, as well as unreliable supply chains, continue to limit the effectiveness and reach of cervical cancer screening services. Strengthening human resources, ensuring reliable transport and supply systems, as well as institutionalising mobile outreach could enhance the consistency and accessibility of screening in rural Namibia.

4.6.2.1.2. Sub-theme 1.2: Availability of HPV Vaccine

Nearly all participants identified the limited availability of the HPV vaccine as a major gap in Namibia's cervical cancer prevention efforts. At the time of the study, the HPV vaccine was not yet introduced in public health facilities, moreover access was largely restricted to the private sector. This situation rendered many girls and young women, particularly those from low-income or rural areas, without access to vaccination services.

- *"Unfortunately, we cannot offer HPV to everyone who needs it, especially the patients who use public health services. It does not exist, but if you have medical aid, I am not sure, but I think you can get it in private."* [P-3]

- *"HPV vaccination is something we only hear about in other countries. We are still waiting for it to come to our public clinics."* [P-6]

The lack of an HPV vaccination programme in the public sector reflects systemic inequity, where access to preventive healthcare is determined by financial capacity rather than need. Moreover, participants expressed that introducing the HPV vaccine through national immunisation campaigns could significantly reduce future cervical cancer burden.

- *"If we can vaccinate our girls early, like we do for polio or measles, we can prevent a lot of problems later."* [P-5]

Participants also expressed hope for policy-level action, noting that an inclusive national rollout would align with Namibia's broader public health goals. Furthermore, the findings underscore the urgent need for government-led HPV vaccination programmes, supported by sustainable financing and community sensitisation, to ensure equitable access and long-term prevention.

4.6.2.1.3. Sub-theme 1.3: Community Outreach Services

Participants shared m views about community outreach activities for cervical cancer prevention. Furthermore, several acknowledged the ongoing efforts through community radio and the involvement

of community health workers (CHWs). However, these initiatives were described as infrequent and limited in coverage, often disrupted by logistical and infrastructural challenges.

- *"Community campaigns are coordinated with CHWs, but screening primarily occurs in clinic settings, not really in the community, due to bad roads and long distances. Every clinic is given a specific date for when we are coming."* [P-1]

- *"We try to do talks on the radio, but sometimes there is no transport or funding to reach the far villages."* [P-4]

Participants also noted that outreach efforts were largely urban-centred, leaving many rural communities underserved. In some areas, even when campaigns were planned, poor road conditions or a lack of vehicles caused frequent cancellations.

- *"Sometimes we plan to go out, but the car breaks down or there is no fuel. Then the whole activity is postponed."* [P-2]
- *"People in remote places wait for us, but when we don't come, they lose interest next time."* [P-5]

Despite these impediments, participants indicated that where outreach activities were successfully implemented, community response was highly positive. Moreover, local participation increased when services were brought closer to the people and combined with educational sessions.

- *"When we manage to go to the villages, women come in big numbers. They just need the service to reach them."* [P-3]

These findings reveal that while community engagement structures exist, outreach remains constrained by limited resources as well as poor logistical coordination. Strengthening mobile health services, ensuring reliable transport, moreover involving local leaders in planning could make outreach campaigns more consistent and sustainable.

4.6.2.2. Theme 2: Health Workforce

A responsive, fair, and efficient health workforce works to achieve the best possible health outcomes, optimising available resources and adapting to prevailing circumstances (World Health Organisation (WHO, 2007). The health workforce theme reflects emerging constraints related to staffing shortages, struggles with staff retention, as well as insufficient specialised training in cervical cancer prevention.

4.6.2.2.1. Sub-theme 2.1: Staff Shortages and Retention

Approximately 90% of the participants cited the limited availability of CECAP-trained nurses and doctors as one of the most pressing challenges. Many district hospitals were reported to have only one or two

trained staff members serving all the facilities, which significantly constrains service continuity and outreach capacity.

- *"They come here to get into the system, then they want to leave, especially the young ones. Housing and bush allowances are provided, but many nurses still transfer out to cities."* [P-3]
- *"It's hard to keep young professionals in these rural postings; they leave for better opportunities and working environments elsewhere."* [P-9]

High staff turnover and frequent transfers were particularly common in remote districts, where retention remains a chronic challenge despite the provision of rural incentives. This instability not only disrupts service delivery however also limits mentorship and skill transfer among staff.

- *"Sometimes you train someone, and before you know it, they are gone. Then you start again with a new person."* [P-4]

Participants also raised concerns about the dependence on NGO-funded positions, which threatens long-term sustainability once donor support ceases.

- *"All of us are conducting this service under NGO support. One day, when the NGO pulls out, there will be a huge challenge."* [P-7]
- *"When projects end, the trained staff move on because the Ministry doesn't always absorb them."* [P-1]

This reliance on externally supported human resources creates uncertainty about programme continuity as well as undermines institutional ownership. Additionally, limited opportunities for ongoing professional development were identified as an impediment to maintaining staff competence and motivation.

- *"We get trained once, and that's it. There should be regular refresher training to keep up with new methods."* [P-5]

Overall, the findings indicate that these regions' cervical cancer prevention programme encounters critical human resource constraints, including inadequate staffing, poor retention, limited supervision, as well as heavy dependence on donor-supported personnel. Addressing these challenges requires strategic workforce planning, investment in local training, moreover stronger government commitment to absorbing and retaining skilled personnel within the public health system.

4.6.2.2.2. Sub-theme 2.2: Training and Specialisation

Most participants reported the critical shortage of specialised staff in cervical cancer prevention, screening, and treatment. Furthermore, the shortage extended beyond general health workers to include trained gynaecologists, oncologists, and cytologists, whose expertise is pivotal for managing advanced or complex cases. In most facilities, particularly at the district and regional levels, staff received only basic

training in cervical cancer screening methods, such as VIA, with limited skills in follow-up care and treatment.

- *"We don't have enough staff with specialised training, which limits the services we can provide."* [P-5]
- *"The entire region only has one specialist, who is assisting from Cuba"* [P-11]

Participants reported that referrals were often made to tertiary hospitals in other regions, which were described as having only one practising gynaecologist responsible for handling a wide range of reproductive health conditions. This created backlogs in the referral system, delayed care, and placed immense pressure on limited specialists.

- *"If the patient comes in with an advanced stage of cervical cancer, we refer them. There is no capacity here."* [P-8]

The lack of specialists also meant that training, mentorship, and clinical supervision were limited. As a result, many nurses providing screening services lacked the ongoing guidance and skill reinforcement needed to maintain quality standards.

- *"Most of us only got short training on VIA, but we need more mentorship and practical sessions to feel confident."* [P-2]

This shortage of expertise not only affects diagnosis and treatment but also weakens preventive and follow-up care, leading to late detection and poor continuity of services. Participants expressed concern that unless specialised training programmes and retention incentives are prioritised, the cervical cancer response in Namibia will remain heavily dependent on external support and referrals.

- *"Even if we train more nurses, without doctors or specialists to support the programme, it will not be sustainable."* [P-3]

These findings indicate that the efficacy of cervical cancer prevention and control depends not only on the number of healthcare providers however also on their level of specialisation, supervision, and institutional support. Strengthening in-country training capacity and establishing mentorship partnerships with tertiary and teaching hospitals could build a more resilient and self-sufficient workforce.

4.6.2.3. Theme 3: Health Information

A strong health information system enables the production, analysis, dissemination, and use of accurate and timely data on health determinants, health system performance, and population health status (World Health Organisation (WHO, 2007). This theme focuses on the challenges in data collection and confidentiality that impact data-driven decisions in cervical cancer prevention

.

4.6.2.3.1. Sub-theme 3.1: Data Collection and Management

Participants from both study regions described the data collection process as predominantly manual, relying on paper-based registers and physical reports. Moreover, only a few facilities had introduced basic digital systems, often with limited functionality. Internet connectivity problems, unreliable power supplies, and shortages of essential equipment, such as computers and printers, were reported as major impediments to digitalisation.

- *"Our data collection is still mostly manual, and without proper connectivity, digital options are hard to implement."* [P-1]
- *"We don't have enough computers because you would want them at each point of care. The CDC should have, but most departments do not have."* [P-2]

These limitations reduce the efficiency and accuracy of reporting, rendering it challenging to generate timely statistics for programme monitoring. Some participants expressed concern that data delays or missing information can distort planning and resource allocation.

- *"Sometimes the reports reach late, or the data is incomplete, which makes it hard to know where the real problem is."* [P-3]

Despite these constraints, participants appreciated quarterly review meetings that enabled clinics and districts to assess their performance and make necessary adjustments.

- *"Data is essential for planning and improving services. If I was here last quarter and I'm here now, it means I need to do more on this."* [P-11]

However, the continuity of such meetings was inconsistent, particularly in districts with few staff or competing workloads.

- *"The data review meeting used to be conducted, but due to a lack of staff, we don't attend all the meetings anymore."* [P-7]

Participants also acknowledged that while data collection instruments exist, the lack of standardisation and technical support sometimes leads to errors and underreporting.

- *"We are using different forms, and some staff don't know how to fill them properly. There should be uniformity and training."* [P-5]

The findings illustrate that although Namibia has established frameworks for health information management, resource and capacity gaps challenge full implementation at the facility level. Strengthening

infrastructure, training staff in data management, as well as integrating digital systems could enhance data quality and enable evidence-driven decision-making in cervical cancer prevention.

4.6.2.4. Theme 4: Health Financing

A sound health financing system secures adequate funding to ensure that individuals can access necessary health services without risking financial hardship or poverty due to medical expenses (World Health Organisation (WHO, 2007). More than 90% of the participants cited financial limitations as a recurrent impediment to the provision of care, affecting nearly all facets of cervical cancer prevention services in both regions.

4.6.2.4.1. Sub-theme 4.1: Budget Constraints

Although Namibia's public health system operates under the principles of Universal Health Coverage (UHC), offering free services in public facilities, participants highlighted that there is no dedicated budget line for cervical cancer prevention. Funding for screening, awareness, and outreach activities is largely pooled under broader reproductive or HIV-related programmes, leading to competition for limited resources.

- *"NGOs are collaborating with the government, giving us the necessary stock and supporting us."* [P-6]
- *"With the support of NGOs, we have been able to keep services running and reach out to more women, especially those who live inland."* [P-7]

Participants widely acknowledged the crucial role of NGO and donor support, which has helped sustain service delivery in the absence of consistent government allocations. However, this dependence also raised significant concerns about long-term sustainability and programme ownership.

- *"All the materials we use come from donor funding. If the project ends, I don't know how we will continue."* [P-4]

Another major concern was the absence of a district-level budget, which limits flexibility and responsiveness to local needs. Moreover, most financial decisions are made at the regional level, leaving district managers unable to allocate funds for urgent operational activities such as transport, maintenance, or community outreach.

- *"We do not have a budget at the district level, only at the region, and the competition is high. Basically, first-come, first-served. So, when there is no money, and we want to buy, for instance, curtains, staff members contribute money. Sometimes, we sell the empty containers from the pharmacy to generate more."* [P-9]

These financial constraints compel health workers to improvise, sometimes resorting to personal funds or informal income-generating efforts to sustain essential services.

- *"Sometimes we use our own money for small things like printing forms or fuel for outreach, because waiting for regional approval takes too long."* [P-3]

Participants also cited that limited funding affects outreach coverage, particularly in remote communities where transport and fuel costs are high.

- *"Without a specific budget, we cannot plan continuous outreach. We wait for NGOs or special campaigns to support us."* [P-8]

The findings indicate that while Namibia's UHC policy provides a framework for equitable access, the lack of dedicated funding and decentralised budgeting severely constrains the effectiveness and sustainability of cervical cancer prevention services. To strengthen financing, participants recommended establishing a ring-fenced budget for cervical cancer within regional and district health plans, supported by stronger coordination between government, NGOs, and NGOs to ensure continuity beyond donor funding cycles.

4.6.2.5. Theme 5: Essential Products, Vaccines, and Technology

A functional health system ensures fair access to high-quality, safe, effective, and cost-efficient medical products, vaccines, and technologies supported by scientifically sound practices (World Health Organisation (WHO, 2007). This theme encompasses the shortages in supplies, equipment, and infrastructure necessary for effective cervical cancer prevention.

4.6.2.5.1. Sub-theme 5.1: Supplies for Screening Services

Essential screening supplies were reported to be generally available in many district hospitals and some clinics, enabling the continued implementation of VIA and Pap smear testing. For early-stage precancerous conditions, a few facilities had the capacity to provide treatment using cryotherapy or thermal ablation techniques.

- *"When a patient presents with precancerous cells, for stage one and two treatments, we manage here at the district hospital; there is one trained doctor."* [P-7]

However, participants across both regions noted recurring stock shortages, particularly Pap smear kits, acetic acid, and gloves, which often resulted in rescheduling or missed appointments. These inconsistencies disrupted service continuity and discouraged women from returning for follow-up visits.

- *"Pap smear testing kits usually run out of stock, then we rebook the patients, especially those who are above 60 years, and give them a date to come back, but sometimes most of them do not come back and only come back when they are sick."* [P-11]
- *"Sometimes we stop screening because acetic acid is finished or the supplies come late from the regional store."* [P-5]

Participants also pointed out the absence of HPV testing kits, which limits the comprehensiveness of screening and early detection efforts.

- *"We only do VIA and Pap smear; HPV testing is not yet available in our setting."* [P-4]

In addition to consumable supplies, the lack of educational materials, such as pamphlets, posters, and demonstration instruments, was cited as a significant impediment to community awareness and health education.

- *"The ministry does not provide pamphlets anymore. Giving health information from the mouth without giving pamphlets is ineffective."* [P-7]

- *"We used to have posters and leaflets for awareness, but now we just talk; it's not the same impact."* [P-9]

These findings reveal that while some facilities are relatively well-stocked for basic screening, inconsistent supply chains, limited stock management, as well as a lack of educational materials undermine continuity of care and patient engagement. Ensuring a reliable logistics system, decentralising procurement, and reinstating information, education, and communication (IEC) materials would enhance both service delivery and community outreach.

4.6.2.5.2. Sub-theme 5.2: Equipment and Infrastructure

Participants consistently reported inadequate infrastructure and outdated screening equipment, which challenge the provision of safe, comfortable, and high-quality screening services. Numerous facilities operate with limited space, insufficient examination rooms, and a lack of dedicated areas for confidential counselling or treatment.

- *"We don't even have examination beds; like this one I am using belongs to casualty, and they can come to get it anytime. Sometimes even this lamp you see here is not working; it's challenging to provide quality care with such limited resources."* [P-4]
- *"The screening room is too small, and there is no privacy. Women feel shy when other patients can hear them."* [P-8]

Basic amenities, including functional lighting, sterilisation equipment, and adequate storage facilities, were also reported as major needs. Broken lamps, unreliable electricity, and poor ventilation affected the quality and safety of services provided.

- *"Sometimes the electricity goes off when you are screening, and we just have to stop until it comes back. There is no backup here."* [P-2]
- *"We share the same room with maternity services, so we have to wait until they finish before we can screen."* [P-6]

Despite these constraints, participants acknowledged that recent renovations and NGO-supported equipment donations had improved working conditions in a few facilities.

- *"We got some equipment from partners last year, which helped a lot, but other clinics still don't have the basics."* [P-3]

The findings illustrate that gaps in infrastructure and equipment remain a systemic impediment to achieving consistent, high-quality cervical cancer services. Moreover, addressing these challenges will require sustained investment in facility upgrades, decentralised equipment maintenance, and targeted resource allocation to underserved areas, ensuring that every woman can access care in a safe and dignified environment.

4.6.2.6. Theme 6: Governance and leadership

Challenges in governance and leadership reflect a lack of cohesive policies and insufficient community engagement in cervical cancer awareness and prevention (World Health Organisation (WHO, 2007).

4.6.2.6.1. Sub-theme 6.1: Prevention Policy

While participants acknowledged that leadership structures exist at the national and regional levels, they described the strategic support for cervical cancer prevention as limited and fragmented. Most indicated that there is no dedicated national policy or framework that guides implementation, monitoring, or accountability for cervical cancer prevention.

- *"The absence of a dedicated policy makes it hard to establish structured, long-term programmes for cervical cancer."* [P-5]

- *"We don't have a specific policy for cervical cancer here; it's all managed under general health."* [P-3]

Participants further explained that cervical cancer is subsumed under broader reproductive health or HIV programmes, rendering it challenging to prioritise and plan specific activities. This integration, while

beneficial for coordination in theory, was viewed as limiting in practice because cervical cancer prevention often received less attention and fewer resources.

- *"Everything comes under general health, so cervical cancer doesn't stand out. If there is funding for other diseases, that's where the focus goes."* [P-7]

In addition, several participants expressed that without a guiding policy, it was challenging to standardise service delivery, referral systems, and community outreach across regions.

- *"Some facilities do VIA every month, others don't. If there was a clear national policy, we would all follow the same schedule and standards."* [P-8]

These findings underscore the necessity for a comprehensive national cervical cancer prevention and control policy, backed by clear implementation guidelines, strong monitoring indicators, and funding mechanisms. Such a policy would align regional programmes, ensure continuity of care, and strengthen accountability.

4.6.2.6.2. Sub-theme 6.2: Community Involvement

Participants widely concurred that community engagement remains weak in cervical cancer prevention. Although there is occasional collaboration with traditional and community leaders, such involvement is typically ad hoc and not formally integrated into health promotion structures. Most advocacy and awareness efforts are focused on other high-profile conditions such as HIV/AIDS, tuberculosis, and malaria, leaving cervical cancer with limited visibility at the community level.

- *"Cultural beliefs and misinformation that your womb will be removed, and many others discourage many people from seeking screening; we need more local champions to advocate for awareness."* [P-2]
- *"People in the community don't talk about cervical cancer. They talk about HIV, TB, and malaria, but not this one."* [P-10]

Participants reported that cultural stigma and silence around reproductive health remain powerful impediments to awareness and service uptake. In many settings, terminologies in vernacular languages about women's reproductive organs or screening are considered inappropriate, discouraging open dialogue.

- *"In our culture, talking about these things is not easy. Women fear being judged or seen as disrespectful."* [P-11]

Despite these challenges, participants appreciated examples of effective collaboration with local leaders in some districts, where their involvement build trust and improve participation.

- *"Community leaders are involved, and we hold meetings with them here and there to discuss health issues."* [P-4]

- *"When traditional leaders talk about it during community gatherings, people listen. It helps a lot."* [P-1]

These findings underscore the need for governance and leadership to extend beyond the formal health system to encompass community participation and ownership. Moreover, strengthening partnerships with traditional authorities, women's groups, and faith-based organisations can foster local advocacy as well as challenge misconceptions. Establishing community-based champions and formalising their role within district health structures could significantly improve awareness, acceptance, and uptake of cervical cancer prevention services.

4.7. Data triangulation

Triangulation refers to the use of multiple data sources to improve the credibility and depth of research findings (Creswell & Creswell, 2018; Flick, 2019). In this study, data triangulation was imperative because cervical cancer prevention is influenced by individual behaviour, community context, and health system conditions, none of which can be fully understood through a single method. Figure 4.14 illustrates how each data source contributed uniquely to understanding cervical cancer prevention in the two regions.

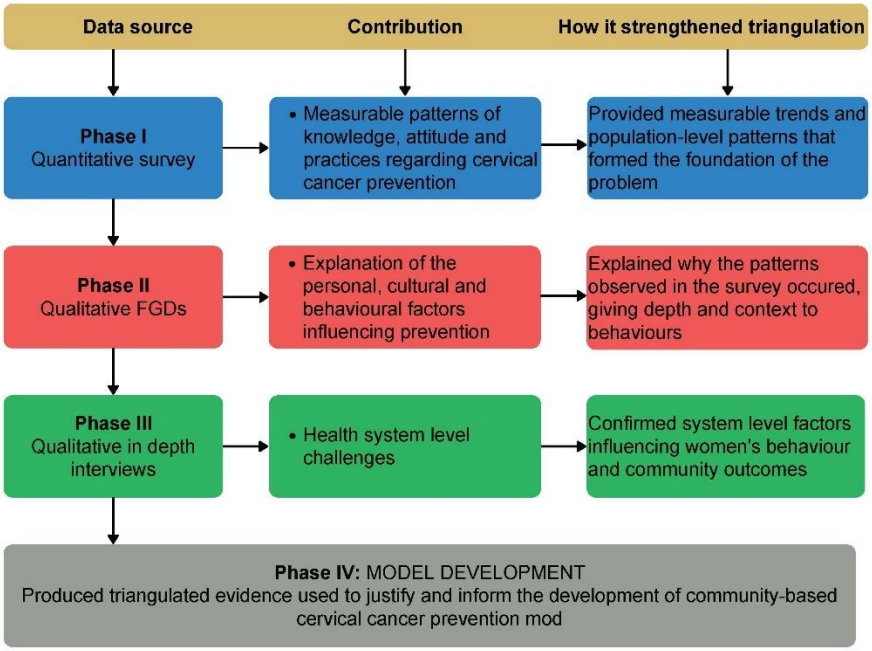


Figure 4.14: Data Sources and Their Contributions to Triangulation

Source: Author (2025).

As illustrated in Figure 4.14, the study brought together evidence from three sources: the quantitative KAP survey, qualitative interviews with women, and qualitative interviews with healthcare workers. Each source added a different layer of insight. Moreover, the survey provided measurable patterns of knowledge, attitudes, and practices. The women's interviews explained the personal, cultural, and behavioural factors influencing screening, while the healthcare worker interviews indicate system-level issues such as staffing, referral pathways, service availability, and resource limitations. Integrating these sources enabled confirmation of common findings, explanation of differences across datasets, as well as building a comprehensive understanding of cervical cancer prevention in the two regions. This approach suits the sequential explanatory mixed-methods design, where qualitative results are used to interpret and extend quantitative patterns. Triangulation also strengthened the rigour of the study by improving credibility and confirmability. The combined evidence formed the basis for developing the community-based cervical cancer prevention model presented in Chapter Six.

CHAPTER 5: DISCUSSION OF THE RESULTS

5.1. Introduction

This chapter presents the study's findings, relating them to previous studies on cervical cancer prevention, the theoretical models employed, and the context of Namibia. Moreover, the study had three main objectives: 1) to assess the level of knowledge, attitudes, and practices (KAP) about cervical cancer prevention among community members; 2) to explore the behaviours of women seeking healthcare; and 3) to investigate any health-system challenges in cervical cancer prevention affecting the two regions studied (Ohangwena and Kavango West). These three objectives aimed to help explain the variables at both the community, service, and system levels that contribute to cervical cancer prevention, and to develop a community-based prevention model for cervical cancer management specifically designed for the Ohangwena and Kavango West regions in Namibia.

More importantly, the results indicated that community members generally report they are aware of cervical cancer; however, they have little to no knowledge about HPV, moreover, numerous do not engage in preventive measures. Overall, attitudes toward cervical cancer prevention were positive and indicate a desire to be screened for cervical cancer if it can be made available through accessible services. Sociocultural impediments, gender-based restrictions on access to care, misinformation, and weak health-system infrastructure continue to create obstacles to achieving successful cervical-cancer prevention strategies.

While similar studies in sub-Saharan Africa have examined knowledge gaps or service barriers independently, this study deliberately integrates community, service, and system-level determinants within a single analytical framework. This multi-layered approach allows for a more comprehensive understanding of how these factors interact within rural Namibia, rather than viewing them as isolated challenges. The following section will discuss these findings in relation to each objective, and moreover, describe their implications for developing policy and/or implementing clinical practice and future research.

5.2. Community knowledge, attitude and practice

This study revealed that although nearly all respondents (94.6%) had heard of cervical cancer, only 41.1% were aware of HPV, and 30.2% knew about the HPV vaccine. This pattern indicates that general awareness is strong, however understanding of the cause, risk factors, and biomedical prevention options remains limited. Similar gaps have been reported in Kenya and Malawi (Were et al., 2021; Nyambe et al., 2020), where communities are familiar with cervical cancer however lack knowledge of HPV and prevention through vaccination. In contrast, studies from Sweden and Australia report HPV awareness levels above 80% (Bray et al., 2021), suggesting persistent disparities in health literacy between high-income and low-income settings. These differences indicate the need for more detailed and consistent health communication in rural Namibian communities.

However, unlike high-income settings where HPV awareness increased following sustained national vaccination campaigns integrated with school-based education, Namibia's prevention efforts remain largely facility-driven and opportunistic. This structural difference may explain why awareness exists without deeper biomedical understanding. The findings therefore do not merely confirm global disparities but highlight how the organisation of health communication influences knowledge depth in rural contexts.

Education emerged as an important predictor of knowledge. Participants with tertiary education were approximately 3.5 times more knowledgeable than those with only primary schooling or no formal education. This finding supports evidence that education enhances the ability to access, interpret, and use health information (Bray et al., 2021). Although employment status predicted awareness in Ghana (Ebu et al., 2020), no such relationship was found in this study, suggesting that in Namibia, education fullfills a stronger function than occupation in shaping knowledge.

These findings suggest that while national campaigns may have increased general awareness, the depth of knowledge remains uneven. Urban and educated groups benefit more from structured sources of information, whereas rural populations rely heavily on sporadic outreach. This reinforces the need for decentralised, community-based education initiatives, particularly for individuals with limited schooling. Importantly, the findings suggest that improving awareness alone may not be sufficient. In several comparable settings, knowledge improved without corresponding increases in screening uptake. This indicates that structural accessibility and trust must operate alongside health literacy to produce behavioural changes. The Namibian context therefore demonstrates the need for simultaneous community and service-level strengthening, a principle that directly informed the design of the proposed model.

Knowledge of risk factors followed a similar pattern. Although respondents commonly identified multiple sexual partners (28.9%) and early sexual debut (11.6%), only 9.8% named HPV infection, and a quarter could not identify any risk factor. This reflects findings from Ethiopia and Botswana, where communities tended to recognise behavioural risks, however, struggled to connect symptoms or transmission to HPV (Endalew et al., 2020; Tapera et al., 2017). Misconceptions such as linking cervical cancer to poor hygiene or "bad luck" illustrate that current messages may lack depth or clarity. Notably, factors often recognised in Uganda, such as smoking or long-term oral contraceptive use (Mukama et al., 2017), were rarely mentioned here, suggesting that local education efforts may emphasise moral behaviour ("avoid many partners") more than biomedical causes ("prevent HPV infection"). This finding points to a gap in the content and delivery of health education materials.

Attitudes toward prevention and screening were generally positive. Most participants concurred that screening detects cervical cancer early, and 94% stated that they would seek medical care if they noticed abnormal bleeding. These results are consistent with studies from Nepal and Nigeria (Ilevbare et al., 2020; Narasimhamurthy & Kafle, 2022), which also found increasing acceptance of early detection. However, fear and uncertainty remain significant impediments, almost half of the participants expressed concerns about pain, harm, or partner disapproval. In contrast, studies from South Africa and Eswatini have

reported a reduction in fear following large-scale reassurance campaigns (Ginindza et al., 2022; Omoyeni & Tsoka-Gwegweni, 2022).

In Namibia, limited exposure to demonstrations and counselling may contribute to persistent anxiety, suggesting that the quality of health communication is as important as its quantity. The strong preference for female health workers (65%) also reflects deep sociocultural norms around privacy and modesty, consistent with studies from Malawi and Eswatini however differing from Ghana, where gender was less influential (Ebu et al., 2020). This underscores the importance of gender-responsive service delivery in increasing uptake.

Despite generally positive attitudes, screening practice was low. Only 37.3% of women had ever been screened, and just 13.9% had received the HPV vaccine, typically from private facilities. This gap between knowledge, attitude, and practice is consistent with evidence across LMICs (Adams & Botha, 2024). Although the screening rate observed here is slightly higher than that of Malawi (15%;) (Nyambe et al., 2020), it still demonstrates that numerous women remain unscreened. Importantly, 70.9% of unscreened respondents expressed willingness to undergo screening in the future.

This suggests that structural impediments such as distance to clinics, transport costs, limited service availability, and fear of pain constrain behaviour more than unwillingness. When these impediments are addressed, uptake could improve rapidly. This gap between willingness and actual behaviour strengthens the argument that cervical cancer prevention in rural Namibia is constrained more by system design than by community resistance. Unlike settings where cultural refusal dominates, the findings suggest latent demand for services that are reliable, respectful, and geographically accessible. This distinction is important because it shifts the focus from behaviour change alone to structural reform.

Health workers were the most common source of information (57.1%), followed by radio and television (29%). These findings align with research from Sudan and Algeria (Boukabene et al., 2020; Siddig et al., 2023), where trusted health professionals fulfill a key function in motivating screening. However, over-reliance on clinical sources means individuals who rarely visit health facilities may remain uninformed. Social media, community radio, and school-based programmes were underutilised, despite their potential to reach young people and men. Strengthening these platforms could normalise conversations about screening and reinforce the role of HPV vaccination as a routine preventive measure.

5.3. Participants' healthcare-seeking behaviour for cervical cancer prevention

Most participants had heard about cervical cancer; however, few demonstrated a deep or accurate understanding of the disease or its link to HPV infection. Several women confused cervical cancer with sexually transmitted infections, while others described it as a curse, punishment from God, or a problem affecting only older women or those with multiple sexual partners. This pattern indicates that awareness is broad however shallow. Women have heard of the disease, yet their understanding of its biomedical causes, symptoms, and prevention methods is incomplete. Similar misconceptions have been documented in Angola (Rocha et al., 2022). By contrast, studies in Botswana and Rwanda, where sustained

national HPV campaigns have been implemented, reported improved comprehension and more proactive health-seeking behaviour (Baussano et al., 2021; Tapera et al., 2017).

These comparisons suggest that Namibian women's ability to make informed preventive decisions is limited by both incomplete knowledge as well as cultural interpretations of illness. Unlike Rwanda, where national coordination and consistent messaging reinforced biomedical understanding across districts, Namibia's more fragmented outreach appears to contribute to uneven comprehension. This suggests that consistency and integration of communication strategies may be as important as the volume of information delivered. When cervical cancer is perceived as a spiritual or moral issue, preventive actions such as vaccination and screening are perceived as unnecessary or irrelevant. As a result, many women delay or avoid screening until symptoms become severe.

Moreover, women's health-seeking behaviour was also strongly shaped by structural barriers. Numerous participants explained that clinics were far from their homes, transport was expensive, and mobile outreach services were inconsistent. Some described walking long distances or waiting months for teams that never arrived. These logistical challenges are consistent with findings from Nigeria, Nepal, and Ghana (Binka et al., 2019; Darj et al., 2019; Modibbo et al., 2016), where rural women also encounter difficulties in accessing screening. In contrast, Rwanda's decentralised model, which integrates screening into maternal, reproductive health, and HIV services, has improved coverage in remote areas (Sayinzoga et al., 2020).

The Namibian context, therefore, suggests that availability and accessibility remain key determinants of whether women engage in cervical cancer prevention. Critically, these findings demonstrate that decentralisation alone does not guarantee access if outreach services are irregular or under-resourced. In contrast to models where screening is embedded within routine maternal and HIV care with predictable schedules, Namibia's intermittent outreach limits continuity and trust. This reinforces the need for structured integration within primary healthcare services.

Furthermore, experiences with healthcare workers fullfilled a significant function in shaping trust and influencing future service use. Moreover, several women described nurses as kind, respectful, and reassuring, which encouraged them to undergo screening. Others, however, reported being scolded, ignored, or embarrassed during clinic visits. Negative encounters discouraged them from returning for services, even when they recognised the importance of screening.

This contrast is supported by evidence from Zimbabwe (Isabirye et al., 2022), where respectful treatment increased screening uptake, whereas poor communication and judgmental attitudes led to long-term avoidance. These findings indicate that women value empathy, privacy, and respectful care as much as clinical competence. Strengthening interpersonal communication as well as ensuring confidentiality within facilities may therefore help build trust and increase continued engagement with preventive care.

Social norms also had a strong influence on women's decisions. While some women felt independent enough to decide to screen on their own, others stated they needed permission from their husbands or

feared being labelled “promiscuous” if they attended the clinic alone. Several worried about gossip from neighbours or misunderstandings about the purpose of screening. These pressures reflect findings from Nigeria and Malawi (Dsouza et al., 2022; Lewis et al., 2020), where spousal control and stigma remain major impediments. In contrast, studies in South Africa indicate that improved gender equality enables women to make more autonomous health decisions (Maseko et al., 2021).

The results from this study suggest that, in Namibia, women’s healthcare decisions remain closely tied to cultural expectations of modesty and obedience. This means that empowering women alone is not enough; interventions must also engage men, families, and community leaders to shift norms and create supportive environments for screening. This insight directly informed the inclusion of interpersonal and community engagement components within the proposed prevention model. Rather than focusing solely on women, the model recognises the relational nature of decision-making in rural Namibia and integrates male involvement and community leadership as structured elements.

Despite the impediments, women identified several motivators that encouraged them to seek preventive care. Positive interactions with nurses, recommendations from peers, as well as information received during other clinic visits fullfilled a key function. Some women were influenced by hearing testimonies from survivors or seeing their neighbours go for screening. These findings align with social influence theory (McLeroy et al., 1988), which emphasises the role of peer norms in shaping behaviour. Similar patterns were observed in South Africa, where group discussions and community support helped normalise screening (Chitha et al., 2023; Omoyeni & Tsoka-Gwegweni, 2022). This suggests that peer and community support can counter fear and stigma. When screening is perceived as a normal, collective behaviour rather than an individual, risky decision, participation increases. Establishing women’s health groups or peer-support circles could therefore strengthen motivation and render preventive behaviour more sustainable.

5.4. Health-System Challenges Affecting Cervical-Cancer Prevention

The study found that although cervical cancer prevention services were available in the two regions, service delivery was inconsistent and unevenly distributed. Moreover, screening methods such as Visual Inspection with Acetic Acid (VIA) and Pap smears were mostly offered at district hospitals, while primary health centres and clinics lacked the capacity to provide these services. In numerous rural communities, outreach activities were irregular due to transport constraints and staff shortages. These findings align with the 2022 Namibia Health Facility Assessment (MoHSS, 2022), which also documented gaps in outreach coverage and the availability of essential equipment. Similar patterns have been reported in South Africa and Malawi, where screening services remain concentrated in urban areas (Malakoane et al., 2020; Maseko et al., 2015). Conversely, Rwanda’s integration of cervical cancer screening into routine HIV and reproductive health services has enabled more comprehensive national coverage (Bruni et al., 2023).

Overall, these findings suggest that Namibia's service delivery approach remains predominantly facility-based, placing the burden on women to travel to distant hospitals rather than bringing prevention services closer to communities. This model limits reach and reinforces existing inequalities between urban and rural populations. In contrast to countries where decentralisation was accompanied by investment in workforce expansion and logistics support, Namibia's facility-based orientation appears to decentralise responsibility without fully decentralising capacity. This distinction helps explain why screening availability remains uneven despite policy intentions.

A shortage of trained and retained health workers further undermined service delivery. Many clinics relied on a single nurse or medical officer trained in cervical cancer prevention, and high staff turnover compromised the continuity of services. Most facilities relied heavily on NGO-CECAP-supported staff, resulting in service interruptions whenever donor funding ended. These findings echo broader workforce shortages documented across the African continent (Oleribe et al., 2019). Studies in Tanzania and Uganda similarly reported inadequate training and limited provider confidence, which affected both service quality and uptake (Kileo et al., 2015; Nakimuli et al., 2022). Conversely, Botswana and Rwanda have strengthened their cervical cancer programmes through decentralised training and task-shifting strategies, enabling community nurses and health workers to perform basic screening procedures (Bruni et al., 2023).

These comparisons suggest that Namibia's human-resource challenges extend beyond staff numbers to issues of distribution, sustainability, and retention. Most skilled healthcare workers are in district hospitals, leaving peripheral clinics understaffed and unable to deliver screening consistently. Introducing rural retention incentives as well as continuous professional development opportunities may help stabilise the workforce and improve service coverage.

The study also found that health information systems were mostly paper based, with limited use of electronic systems for data entry, tracking, or follow-up. VIA and Pap smear records were stored manually, and follow-up of positive cases was often delayed or incomplete. In addition, poor internet connectivity in remote areas further impeded timely reporting. These challenges are consistent with the Ministry of Health's (2022) report, which highlighted weak data management as a key obstacle to monitoring prevention programmes. Similar data gaps have been reported in many LMICs, where incomplete or inaccurate records contribute to missed follow-up and underreporting of screening outcomes (Hoxha et al., 2020). In contrast, Uganda's adoption of an electronic screening registry significantly improved case tracking and continuity of care (Nakimuli et al., 2022).

These findings indicate that poor information flow undermines the efficacy of cervical cancer programmes. Without reliable data, managers cannot plan outreach activities, allocate resources, track coverage, or assess progress toward the WHO 90–70–90 targets. Strengthening health information systems through digitalisation, routine audits, as well as staff training could improve decision-making and accountability. The absence of reliable tracking mechanisms also influenced the design of the model,

which incorporates strengthened monitoring and feedback loops as essential components for sustainability.

Financing for cervical cancer prevention was also insufficient and unstable. There was no dedicated national budget for screening or HPV vaccination, moreover numerous services depended on NGO support or short-term donor-funded projects. Participants reported frequent shortages of essential supplies, including speculums, examination lamps, and acetic acid used during VIA. These findings reflect challenges commonly observed in many sub-Saharan countries, where weak financing and dependence on external partners hinder programme sustainability (Mutyaba et al., 2019; WHO, 2020). Conversely, Botswana and South Africa demonstrate that sustained government investment can achieve nationwide HPV vaccination and screening coverage (Bruni et al., 2023).

Namibia's reliance on external funding for programmes such as cervical cancer creates vulnerability, because, when donor programmes end, service delivery declines. The lack of funds at the district level also means preventive activities are overshadowed by curative priorities. Allocating a dedicated government budget for cervical cancer prevention would stabilise supply chains, support consistent screening, as well as strengthen accountability for implementation.

Weak governance and limited coordination further contributed to system-level challenges. Participants noted the absence of a stand-alone cervical cancer policy and explained that prevention activities were implemented under general reproductive-health programmes without clear leadership or oversight. Additionally, community engagement was minimal, and monitoring mechanisms were irregular. These observations align with the WHO (2007) health systems framework, which emphasises governance as a critical pillar for effective service delivery.

Similar gaps have been documented in Zimbabwe, where fragmented leadership led to inconsistent programme implementation (Zibako et al., 2022). In contrast, Rwanda's strong political commitment and coordinated national leadership have driven significant progress toward eliminating cervical cancer (Bruni et al., 2023). The Namibian findings, therefore, point to institutional invisibility: without clear policy direction, designated leadership, and structured community involvement, coordination remains weak and progress is slow. Strengthening governance through policy development, clear role allocation, routine review meetings, as well as structured community engagement could enhance coherence and commitment. These governance weaknesses highlight that cervical cancer prevention is not limited by clinical knowledge alone but by institutional coordination. The proposed model therefore embeds stewardship and accountability mechanisms at the system level to ensure continuity beyond donor cycles.

Finally, the study revealed limited community participation in prevention activities. Outreach programmes were largely designed and led by health officials, with minimal involvement of local leaders, traditional authorities, or community-based organisations. Moreover, this finding contrasts with successful community mobilisation approaches in Zimbabwe and Rwanda, where chiefs, women's groups, and community champions fullfilled key functions in promoting screening uptake (Zibako et al., 2021; Bruni et al., 2023). The Namibian experience suggests that the health system continues to operate under a strongly

biomedical model that does not fully leverage community structures. Engaging traditional, faith-based, and youth leaders could improve trust, address misconceptions, as well as strengthen community ownership of prevention programmes.

5.5. Summary

Overall, the study demonstrates that cervical cancer prevention in rural Namibia is influenced by multiple layers of determinants knowledge, social norms, service availability, and system capacity. Although awareness of cervical cancer is widespread, a profound understanding of HPV, symptoms, and prevention remains limited. Social expectations, distance, cost, and inconsistent services further constrain women's ability to seek screening. Weak governance, inadequate financing, workforce shortages, and poor data systems reinforce these challenges. Importantly, while many of these patterns have been reported in other low-resource settings, this study demonstrates how they interact within Namibia's specific rural context, characterised by geographic dispersion, donor-dependent service delivery, and strong sociocultural norms around gender and modesty.

The integration of these contextual realities into a structured community-based prevention model represents the primary novel contribution of this research. These findings justify the need for a community-based prevention model that brings services closer to women, strengthens health literacy, as well as ensures stronger system support. The model developed in the next chapter offers a practical framework for improving cervical cancer prevention and advancing national progress toward the WHO 90-70-90 elimination targets.

CHAPTER 6: MODEL DEVELOPMENT

6.1. Introduction

This chapter outlines the process adopted to develop a community-based model for cervical cancer prevention in Ohangwena and Kavango West regions in Namibia. The model was developed through an empirically grounded, theory-informed synthesis process. While the core concepts emerged from the quantitative and qualitative findings of this study, existing theoretical frameworks (HBM, SEM, and WHO Health System Building Blocks) were used deductively to guide interpretation and structural organisation. Thus, the model represents an integration of inductive empirical insights and deductive theoretical alignment.

Moreover, the development process was guided by Chinn and Kramer's (2023) model development framework, who explains that model development involves the systematic generation of concepts, linking them through relationship statements, constructing a logical structure, and validating it for practical use. In addition, Walker and Avant's (2019) method of concept and statement synthesis was employed to ensure the process was rigorous and logically consistent.

Conceptually, the proposed model is positioned as a context-specific, mid-range implementation model rather than a grand theory. It does not seek to explain all aspects of health behaviour universally, but instead provides a structured, operational framework designed to guide cervical cancer prevention within rural Namibian settings. Its level of abstraction allows both practical application and empirical testing in similar low-resource contexts. This chapter integrates findings from all three phases into a structured conceptual model and concludes with the validation and proposed operationalisation process.

6.2. Purpose and rationale of the model

The model was developed to address the gaps identified in cervical cancer prevention in the Ohangwena and Kavango West regions of Namibia. More importantly, findings from the three study phases revealed that while awareness of cervical cancer exists, access to screening and follow-up services remains limited, and the health system lacks adequate coordination at the community level. Moreover, women encounter structural impediments such as distance, lack of transport, stigma, and inconsistent health education. Therefore, the model seeks to strengthen community participation, integrate prevention activities within primary healthcare, as well as ensure a supportive system that sustains ongoing health education, HPV vaccination, screening, early detection, and timely treatment. The rationale is to connect individual behaviour change with service readiness and policy support so that awareness is translated into sustained utilisation and outcomes.

6.3. Theoretical and empirical foundation

The model development was grounded in both theoretical frameworks and empirical data, ensuring scientific rigour and contextual relevance to rural Namibia. The process was guided by three main theoretical frameworks: the HBM, the SEM and the WHO Health System Building Blocks Framework, as

well as by model development principles proposed by Chinn and Kramer (2023) and Walker and Avant (2019).

6.3.1. Theoretical Foundation

The development of the community-based prevention model required a theoretical foundation that could explain cervical cancer prevention from the individual, social, and health system perspectives. Each of the three frameworks below adopted in this study contributed a unique and essential dimension to the final model.

a) **The Health Belief Model** was crucial for understanding the behavioural foundations of prevention within the community. The first phase of the study assessed what people know, how they feel, and what they do in relation to cervical cancer. Moreover, it provided a logical structure for interpreting these findings. It revealed behavioural gaps, such as high awareness however low screening practice, that formed the basis of the community layer of the model. This ensured that the model addressed real community needs, such as strengthening information access, improving health literacy, and enhancing empowerment.

b) **The socioecological** model provided the needed depth to understand the broader social and cultural influences shaping women's health-seeking behaviour. Moreover, screening decisions in rural Namibia are not purely individual choices; they are shaped by partners, families, community expectations, traditional norms, as well as institutional conditions. This model enabled the study to capture these multiple layers of influence, which directly informed the service level of the final model. By grounding the model in real social dynamics, the Ecological Model ensured that community engagement, trust-building, and culturally sensitive service delivery became key pillars of the final framework.

c) **The WHO Health System Building Blocks Framework** was imperative for identifying and organising the structural and organisational factors that affect the availability and quality of cervical cancer prevention services. Findings from healthcare workers indicated system impediments, including workforce shortages, limited supplies, weak referral pathways, and inadequate financing. The Building Blocks model provided a clear avenue for analysing these findings and directly informed the systemic level of the final model. Moreover, this ensured that the final model addressed not only community behaviour as well as service delivery, however also the broader system conditions required for sustainability.

6.3.2. Empirical foundation

The development of the model was firmly grounded in the empirical findings from the three phases of this study. In addition, model development was also guided by Chinn and Kramer's (2023) approach to theory and model development, moreover, the process followed four main activities:

1) **Concept identification**: extracting the key ideas emerging from empirical data.
2) **Relationship formulation**: determining how these concepts influence one another.

3) **Model construction**: visually organising the concepts into a coherent structure.
4) **Validation and application**: ensuring that the model is relevant, logical, and applicable in practice.

6.3.2.1 Step 1: Concept identification

Phase I (KAP Survey)-how concepts were identified

Phase I indicated gaps in knowledge, attitudes, and practices related to cervical cancer prevention. Although 94% of respondents had heard of cervical cancer, far fewer understood HPV, prevention methods, screening schedules, or the purpose of VIA. Many relied on informal sources of information; moreover, misconceptions were common. Despite generally positive attitudes, screening uptake remained low.

From these patterns, the following community-level concepts were identified:

- **Information Access:** This arose from findings indicating that most participants relied on radio, friends, relatives, or health talks as their main sources of information. Numerous participants did not receive clear or consistent messages from health facilities, highlighting gaps in structured information access.
- **Health Literacy:** Low understanding of HPV, screening intervals, symptoms, and risk factors indicated limited health literacy. Participants' difficulty interpreting prevention messages strengthened this concept.
- **Empowerment:** Although attitudes were positive, many women felt uncertain, fearful, or dependent on others (especially partners) to access screening. This underscored empowerment as a core behavioural concept affecting prevention action.
- **Social Support:** The KAP survey revealed that many women required approval or encouragement from partners and family before attending screening. This established social support as an important enabling or limiting variable.
- **Health-Seeking Behaviour:** Low screening uptake, minimal follow-up, as well as reliance on traditional choices identified health-seeking behaviour as a central concept in cervical cancer prevention.
- **Cultural Influence:** Beliefs around modesty, fear of vaginal examination, stigma, and cultural norms around decision-making emerged as strong contextual variables influencing practice.

Phase II (Women's Qualitative Interviews) – How service-level concepts were identified

Phase II revealed deeper explanations for the behaviours observed in the KAP study. Women described emotional, practical, as well as relational impediments related to service experiences. Their voices directly shaped the following service-level concepts:

- **Access and Availability:** Women described long distances, transport difficulties, clinic closures, and inconsistent outreach services. These patterns made access a core structural concept.

- **Integrated Service Delivery:** Participants expressed confusion when services were fragmented (e.g., screening available only on certain days, no counselling, inconsistent follow-up). This indicated a need for integrated, continuous services.
- **Health Workforce:** Women repeatedly mentioned staff shortages, lack of trained personnel, and reliance on specific nurses to conduct VIA. This showed the centrality of workforce capacity.
- **Health System Trust:** Experiences of embarrassment, disrespect, fear of pain, and uncertainty about results shaped women's trust in the health system. Trust emerged as a behavioural link between service quality and screening uptake.
- **Quality of Care:** Reports on inconsistent procedures, poor communication, unclear instructions, as well as long waiting times underscored quality of care as a core concept.
- **Referral System:** Women described being sent back and forth between facilities, unclear referral instructions, delays in receiving results, and loss to follow-up. These insights made referral pathways a crucial concept.

Phase III (Health-System Interviews) – How systemic concepts were identified

Phase III captured health-system and organisational impediments that explain many service delivery gaps. Healthcare workers highlighted structural issues such as poor coordination, weak policy implementation, limited funding, and inadequate instruments for community engagement. This generated the following system-level concepts:

- **Political Commitment:** Participants pointed out delays in programme support, unclear priorities, and a lack of leadership attention to prevention. These insights established political commitment as a foundational concept.
- **Funding:** Inconsistent budgets for outreach, shortages of equipment, as well as reliance on donor-supported programmes identified sustainable funding as a core system concern.
- **Information Packages:** Health workers emphasised the need for clear guidelines, community materials, procedural job aids, as well as structured education instruments, leading to the concept of information packages.
- **Multisectoral Partnership:** Respondents indicated the need for education, local leaders, NGOs, and community structures to collaborate, which led to this concept.
- **Digital Health Systems:** Participants mentioned digital reminders, electronic instruments for tracking appointments, and data systems for reporting. This confirmed digital health as a core enabler.
- **Stewardship and Coordination:** Weak supervision, unclear roles, as well as inconsistent planning identified coordination as a critical system function.

Table 6.1: Definition of concepts

Concept	Definition (Study Context)
Information Access	The extent to which community members are exposed to clear, accurate and consistent information about cervical cancer, HPV, screening services and prevention options through formal or informal channels.
Health Literacy	The ability of women and community members to understand, interpret, and apply cervical cancer information, including knowing what screening is, when to undergo it, and why follow-up is necessary.
Empowerment	The confidence, motivation and personal agency that enable women to make informed decisions, overcome fear and stigma, and take independent action to seek screening and follow-up care.
Social Support	Encouragement, approval, or assistance provided by partners, family members, peers, or community structures that enable or discourage women from attending screenings or following recommended care.
Health-Seeking Behaviour	The actions taken by women to attend screenings, return for follow-up, seek information, or encourage others, based on their knowledge, support, and readiness.
Cultural Influence	Community norms, beliefs, gender expectations and traditional values that shape how women understand cervical cancer, discuss reproductive health and make decisions about screening.
Access and Availability	The practical ability to reach and use screening services, shaped by distance, transport, clinic hours, staff availability and equipment readiness.
Integrated Service Delivery	The organisation of screening, counselling, health education, follow-up and referral so they are coordinated and consistently available within the same care pathway.
Health Workforce	The availability, competence and responsiveness of nurses and healthcare workers who provide screening, counselling and referral services.
Health System Trust	The level of confidence women have in health workers, service quality, confidentiality and the overall experience of care.

Quality of Care	The consistency, safety and reliability of screening services, including respectful care, proper technique, clear communication, timely results and guideline adherence.
Referral System	Processes that ensure women with abnormal results are correctly referred, tracked, and managed across all levels of care without delay.
Political Commitment	The degree of leadership support and prioritisation given to cervical cancer prevention at the regional and national levels.
Funding	The financial resources allocated to support screening, outreach, follow-up, staff training, equipment and continuous service delivery.
Information Packages	Practical tools and materials such as guidelines, community education materials, communication aids and job aids that support consistent messaging.
Multisectoral Partnership	Collaboration between health services, community leaders, NGOs, schools and local structures to support outreach, follow-up and health education.
Digital Health Systems	Systems and digital tools used to support reminders, client registration, follow-up tracking, data management and coordination.
Stewardship and Coordination	System-level oversight and management ensuring implementation, monitoring, supply consistency, supervision and alignment.
System Readiness	The overall ability of the health system to provide infrastructure, resources, policies and support for sustainable cervical cancer prevention.
Service Effectiveness	The extent to which services achieve intended results, such as consistent screening, timely follow-up and positive client experiences.
Empowered Community	A community where women and families are informed, confident, supported, and actively participating in cervical cancer prevention.
Strengthened Cervical Cancer Prevention	The final outcome is where community, service and system levels work together to ensure screening coverage, early detection, timely treatment and continuity of care.

Source: Author (2025).

Although information related constructs appear across different levels of the model, they represent distinct functions. “Information Access” refers to exposure at the community level; “Health Literacy” refers to the cognitive capacity to interpret and apply information; and “Information Packages” refer to structured institutional tools such as guidelines and job aids that standardise service delivery. This differentiation ensures conceptual clarity and prevents overlap between community-level awareness and system-level instruments.

6.3.2.1.1. Synthesis of Conceptual Categories Across Phases I-III

After identifying all the concepts from the three phases, the next step was to refine, compare and organise them in a way that reflected their true meaning within the study. This process involved moving back and forth between the coded data, the thematic summaries, and the quantitative patterns to confirm that each concept accurately represented what participants described. Similar ideas were grouped together, overlapping meanings were separated, and broad concepts were analysed into more precise components. For example, issues initially labelled as “poor services” were divided into access, workforce, trust, quality of care and referral pathways, while information-related issues were clarified into information access, health literacy and information packages.

Moreover, system-level findings were also analysed carefully to distinguish between political commitment, funding, digital systems, partnerships, and coordination, rather than treating them as a single category. Through this iterative process, the final concepts were organised into three coherent levels: community, service, and systemic, each capturing a different layer of influence on cervical cancer prevention in rural Namibia. These refined concepts formed the foundation for the next steps of the model, including identifying relationships, arranging the structure, and validating the model with experts.

6.3.2.2. Step 2: Construction of relationship statements

Step 2 involved constructing clear relationship statements that describe how the identified concepts interact to influence cervical cancer prevention. Following Chinn and Kramer’s guidance, the relationships were expressed by assigning directional arrows to indicate whether the influence was one-way or reciprocal. Moreover, each relationship statement explains how one concept strengthens, shapes or enables the next, forming a logical flow from community-level factors to service delivery processes and broader system conditions. This step clarified the internal structure of the model by demonstrating how the concepts function together to produce key outcomes such as increased screening coverage, early detection and strengthened community-based cervical cancer prevention.

The model proposes that sustainable cervical cancer prevention occurs when empowered communities generate informed demand for screening, services are structurally prepared to meet this demand through accessible and respectful delivery, and system-level governance ensures continuity through political commitment, financing, coordination, and feedback mechanisms. Prevention outcomes are therefore not linear events but the product of reinforcing interactions between community agencies, service effectiveness, and systemic readiness.

Table 6.2: Relationship statements between concepts

Concept Relationship	Description of Interaction
Information Access ↔ Health Literacy	When community members receive clear and reliable information about cervical cancer and screening, they are more capable of understanding what the disease is, how screening works and why prevention is important.
Health Literacy ↔Empowerment	As understanding increases, women gain confidence, feel more in control and become more willing to make informed decisions about their health.
Empowerment ↔ Social Support	Empowered women are more likely to communicate with partners, family and peers, which encourages supportive attitudes and strengthens collective motivation for screening.
Social Support ↔ Health-Seeking Behaviour	Support from partners, family and peers encourages women to attend screening, while women who seek care also influence others to do the same, creating a reinforcing cycle.
Social Support ↔ Cultural Influence	Community support can challenge or reinforce cultural norms, while cultural norms influence whether women receive support to seek screening.
Health-Seeking Behaviour ↔ Cultural Influence	As more women seek screening, prevention becomes normalised, slowly shifting cultural beliefs and reducing stigma.
Cultural Influence ↔ Access and Availability	Positive cultural attitudes increase demand for services, motivating facilities and outreach teams to extend access and bring services closer to communities.

Access and Availability ↔ Integrated Service Delivery	When clinics and outreach services are reachable, it becomes easier to organise screening, counselling, follow-up and referral under a consistent and integrated care pathway.
Integrated Service Delivery ↔ Health Workforce	Integrated services depend on trained and available staff, while a supported workforce performs better when services are well-organised.
Health Workforce ↔ Health System Trust	Respectful, competent and supportive healthcare workers build trust, encouraging women to return for screening and follow-up.
Health System Trust ↔ Quality of Care	High-quality care increases trust, and increased trust motivates women to engage more positively with services, creating a reinforcing loop.
Quality of Care ↔ Referral System	Reliable quality of care ensures correct referrals and follow-up, while a strong referral system supports consistent and safe service quality.
Referral System → Service Effectiveness	A clear and functioning referral pathway ensures women with abnormal results receive timely follow-up and treatment, improving the overall effectiveness of services.
Service Effectiveness → Political Commitment	When services perform well, they produce evidence and community feedback that encourage leaders to prioritise prevention efforts.
Political Commitment ↔ Funding	Strong political support leads to better allocation of resources, while successful use of funding strengthens political will.
Funding ↔ Information Packages	Adequate funding enables the development of guidelines, job aids and community materials; these materials also improve planning and justify continued funding.

Information Packages → Multisectoral Partnership	Clear and standardised information enables partners such as schools, NGOs and community leaders to deliver accurate messages and support outreach.
Multisectoral Partnership ↔ Stewardship and Coordination	Partnerships rely on strong system coordination, while good coordination is strengthened by active multisectoral involvement.
Stewardship and Coordination → Digital Health Systems	Effective system oversight supports the rollout and maintenance of digital tools for reminders, reporting and tracking.
Digital Health Systems → System Readiness and Support	Digital systems strengthen readiness by improving data flow, follow-up tracking, decision-making and service organisation.
System Readiness and Support → Increased Screening Coverage	A supportive system ensures that services have the tools, staff and resources needed to reach more women and expand coverage.
Increased Screening Coverage → Early Detection and Treatment	As more women are screened, precancerous lesions are identified earlier, resulting in timely treatment and improved outcomes.
Early Detection and Treatment → Improved Cervical Cancer Prevention	Early diagnosis and timely treatment reduce progression to cervical cancer and reinforce the long-term effectiveness of community-based prevention.

Source: Author (2025).

6.3.2.2.2. Grouping Concepts into Model Layers and Development of Outcomes

After establishing the relationships between the concepts, the next step involved grouping them into coherent model layers. Moreover, the levels were selected based on both the structure of the empirical findings and the natural flow of influence observed in the data. The three layers: community, service, and systemic, represent the major components through which cervical cancer prevention is shaped in rural Namibia. These levels also align with how prevention programmes typically function in real settings, where community behaviour interacts with service delivery, and service delivery is shaped by broader system conditions.

The decision to organise the model into community, service, and systemic levels was driven by data from all three phases of the study. The findings indicated that prevention does not occur at a single point however, across multiple, interconnected environments:

- **Community level:** Phase I and parts of Phase II indicated that numerous impediments commence within communities, including how information is shared, how women make decisions, cultural expectations, as well as the influence of partners and social networks. These elements directly affect whether women even attempt to access screening.
- **Service level:** Phase II revealed that women's experiences within clinics strongly influenced their willingness to return. Variables such as workforce availability, the quality of care, communication, moreover referral consistency determined whether screening was accessible and meaningful.

- **Systemic level:** Phase III indicated system-wide issues such as political prioritisation, funding, coordination, information instruments and partnerships that affect service continuity and quality. These conditions enable or undermine the entire prevention process.

The three layers were therefore selected because they reflect the natural sequence through which cervical cancer prevention unfolds: women make decisions within communities, they encounter services shaped by organisational structures, moreover those services rely on broader system support.

Development of Outcomes

Once concepts were organised into their respective layers, the next step was to identify outcomes that naturally arise when the concepts within each level interact. Each outcome reflects what the level is expected to achieve when its concepts function together, moreover these outcomes form the backbone of the prevention pathway illustrated in the model.

Community-Level Outcome: Empowered Community

This outcome was identified because the interaction of information access, improved health literacy, personal empowerment, social support, positive health-seeking behaviour, as well as cultural influence leads to a community that is more informed, confident, moreover willing to participate in prevention activities. The Phase I KAP findings reveal limited understanding of HPV and screening schedules, and the Phase II findings indicate fear, stigma. Moreover, partner influence indicated that prevention cannot progress without an informed and empowered community. Therefore, an empowered community was selected as the foundational outcome that drives demand for prevention.

Service-Level Outcome: Service Effectiveness

This outcome was selected because when service-level concepts operate effectively, with adequate staffing, integrated pathways, respectful care, strong referrals, and trusting relationships, the service becomes more effective. More importantly, this was consistently reflected in the experiences of both women and healthcare workers. Women described how positive interactions, clear communication as well as consistent availability encouraged them to return for follow-up, while service gaps discouraged

engagement. Thus, service effectiveness represents the ability of facilities to provide accessible, coordinated and reliable cervical cancer prevention services.

Systemic-Level Outcome: System Readiness and Support

The systemic outcome was identified based on the combined influence of political commitment, funding, information packages, multisectoral partnerships, digital health systems, and stewardship and coordination. When these elements function together, they create an enabling environment for service delivery. Phase III findings indicated that gaps in funding, supervision, partner coordination and digital instruments undermined prevention initiatives, while improvements in these areas strengthened implementation. Therefore, system readiness and support were selected as the outcome that captures the system's capacity to sustain and scale cervical cancer prevention activities.

Intermediate Prevention Outcomes: These outcomes represent the measurable effects that occur when the community, service and system levels function as intended. Moreover, the study findings revealed that limited knowledge, low trust, poor service organisation as well as inconsistent referral pathways directly contributed to low screening uptake and delayed diagnosis. When these impediments are addressed through empowered communities, effective service delivery and strong system support, prevention outcomes commence to shift.

As a result:

- More women come forward for screening,
- Abnormalities are detected earlier,
- Women receive timely referral and treatment, and
- Continuity of care improves across the prevention pathway.

Final Model Goal: Strengthened Community-Based Cervical Cancer Prevention

This final outcome reflects the combined influence of all three levels functioning together. Moreover, it was selected because the study consistently demonstrated that prevention improves only when communities are informed and empowered, services are organised and trustworthy, and the health system provides stable support. When the three layers interact and reinforce one another, they produce a stronger and more sustainable prevention response. This leads toward the broader public health aspiration captured in the model, strengthened community-based cervical cancer prevention in rural Namibia.

Table 6.3: Summary of the levels and Key Concepts of the Model

Levels	Key Concepts	Main Function	Outcome
Community Level	Information Access; Health Literacy; Empowerment; Social Support; Health-Seeking Behaviour; Cultural Influence	Builds awareness, confidence, motivation, and supportive social norms that encourage women to seek screening and follow-up care	Empowered Community
Service Level	Access and Availability; Integrated Service Delivery; Health Workforce; Health System Trust; Quality of Care; Referral System	Translates community demand into action by providing accessible, organised, respectful and continuous cervical cancer prevention services	Service Effectiveness
Systemic Level	Political Commitment; Funding; Information Packages; Multisectoral Partnership; Digital Health Systems; Stewardship & Coordination	Provides the policies, resources, tools, and coordinated oversight needed to sustain and scale cervical cancer prevention	System Readiness and Support
Intermediate Prevention Outcomes	Higher screening uptake; Early detection of abnormalities; Timely treatment; Continuity of care	Reflects the measurable results of empowered communities, effective services, and system support	Improved prevention outcomes

Final Model Goal	—	Represents the combined impact of all layers and outcomes working together	Strengthened community-based cervical cancer prevention

Source: Author (2025).

6.3.2.3. Step 3: Model Description and Structural Representation

According to Chinn and Kramer (2023), the model description and structural representation phase involves giving form to the abstract concepts developed in earlier steps. At this stage, the researcher moves beyond listing concepts and relationships to describe how the concepts are arranged, how they interact, and what overall pattern or structure they create. Building on the defined concepts and relationship statements, this phase focused on translating the empirical concepts and relationship statements from the study phases into a clear and structured representation.

6.3.2.3.1. Purpose of the model

The purpose of the model is to provide a practical, evidence-based framework that links community participation, health service readiness, as well as system governance to improve cervical cancer prevention and early detection in rural Namibia. The overall aim is to ensure that every woman, regardless of her location, has access to accurate information, timely screening, and continuous care within a supportive healthcare system.

6.3.2.3.2. Objectives of the Model

1. To guide the integration of cervical cancer prevention activities into community and primary healthcare structures.
2. To promote community ownership and gender-inclusive participation in cervical cancer prevention.
3. To enhance service delivery through trained, motivated health workers and efficient referral systems.
4. To strengthen system-level coordination, financing, and data utilisation for evidence-based decision-making.
5. To create a sustainable, feedback-driven mechanism that connects community action, service provision, as well as policy support.

6.3.2.3.3. Benefits of the Model

- Provides a structured framework to strengthen cervical cancer prevention from the community to the system level.
- Encourages community empowerment as well as participation as the foundation for sustainable health action.
- Enhances service delivery efficiency by integrating screening and vaccination within existing programmes.
- Supports evidence-based decision-making through improved data use and coordination.
- Promotes long-term sustainability by aligning community initiatives with national policies and resources.
- Serves as a replicable framework for other resource-limited settings aiming to eliminate cervical cancer.

6.3.2.3.4. Description of the proposed model structure

This model, illustrated in Figure 6.1, demonstrates how cervical cancer prevention can be effectively implemented in rural Namibia when communities, health services, and the wider health system all support one another. The model is organised into three coloured layers: the community level (blue), the service level (grey), and the systemic level (yellow). Each colour represents a different part of the prevention journey, however all three function together to achieve one final goal: cervical cancer-free communities. The colours were selected to provide each layer of the model with a clear visual identity as well as to indicate the flow of influence across the levels. Blue was assigned to the community layer because it represents trust, safety and social belonging, reflecting that prevention begins with people, families and communities. Grey was assigned to the service layer because it signals action, responsiveness as well as the practical work of delivering timely, quality care. Yellow was assigned to the systemic layer because it conveys leadership, stability and long-term support from government, partners and the health system. These colours were intentionally selected to render the model easy to interpret and to indicate how each level contributes to strengthening cervical cancer prevention.

Moreover, Solid arrows indicate direct influence from one concept to the next (for example, Information Access → Health Literacy) and also link the community, service and system levels to illustrate how change progresses upward through the model. Double-headed arrows are assigned only where concepts genuinely influence each other, such as the reciprocal relationship between Social Support ↔ Health-Seeking Behaviour. Horizontal solid arrows connect the three levels to indicate movement from community action to service delivery and then to system support. Dotted arrows represent feedback loops from the prevention outcomes back into each level, indicating continuous learning, adjustment and improvement across the model. Below is a brief description of the model”

The mechanisms through which change occurs in the model include normative influence (where increased screening behaviour shifts community norms), relational reinforcement (where trust between clients and providers increases return visits), organisational efficiency (where integrated service delivery reduces

missed opportunities), and governance reinforcement (where improved outcomes strengthen political will and resource allocation). These mechanisms explain how interactions between concepts translate into measurable prevention outcomes.

Community Level

The community layer forms the foundation of the model because prevention commences with what women know, believe and experience in their daily lives. This layer includes information access, health literacy, empowerment, social support, health-seeking behaviour and cultural influence. These concepts function together to build understanding, confidence, as well as supportive social norms that enable women to seek screening and follow-up care. When they interact effectively, they produce the community-level outcome of an empowered community. In the model structure, this layer is placed at the base because it drives demand for services.

Service Level

The service level sits above the community layer because it translates community motivation into action. This layer includes access and availability, integrated service delivery, the health workforce, health system trust, quality of care and referral pathways. Moreover, these concepts represent the experiences that women encounter when interacting with the healthcare system. When services are accessible, respectful, consistent and well-coordinated, they produce the outcome of service effectiveness. This layer bridges the gap between community readiness and system support, reflecting the practical point where decisions turn into real prevention.

Systemic Level

The systemic level forms the outermost layer because it creates the broader environment that enables or constrains service delivery. Furthermore, this layer comprises political commitment, funding, information packages, multisectoral partnerships, digital health systems, stewardship and coordination, system readiness, and support. These concepts determine whether services have the necessary resources, instruments, coordination, and policy guidance for sustainable prevention. When they function well, they produce the outcome of system readiness and support.

Outcome Pathway and Final Model Goal

The three layers interact to produce intermediate prevention outcomes: higher screening uptake, early detection of abnormalities, timely treatment as well as improved continuity of care. Moreover, these reflect measurable improvements that arise when communities are empowered, services are effective, and the system provides stable support. Together, these outcomes contribute to the overall goal of the model, which is to improve community-based cervical cancer prevention.

Explanation of What the Arrows Represent in the Model

The arrows in the model illustrate how the different components interact to strengthen cervical cancer prevention. The vertical arrows indicate a step-by-step flow within each level, showing how one concept builds upon the next. At the community level, access to information enhances health literacy, which in turn strengthens empowerment and encourages health-seeking behaviour within the cultural context. At the service level, access and availability support integrated service delivery, which in turn reinforces the health workforce, builds trust, enhances the quality of care, and strengthens the referral system. Similarly, at the systemic level, stewardship and coordination shape political commitment, which enables funding and supports information systems, partnerships, and digital health capacity.

In addition to this internal flow, the single-direction arrows show one-way influence, such as how community empowerment contributes to service effectiveness and how system readiness enables improvements at lower levels, ultimately leading to better prevention outcomes. The bilateral arrows represent mutual influence between components, highlighting the continuous feedback loops between community, service, and system levels. These two-way exchanges show that progress in one area reinforces gains in another. Finally, the dashed arrows indicate indirect pathways and long-term feedback processes. They show how improved outcomes, such as higher screening uptake and continuity of care, feedback into community motivation, service improvements, and system planning. Altogether, the arrows demonstrate that prevention is not a linear process but a dynamic cycle where each level strengthens the others.

The model's name: Community-based cervical cancer prevention model

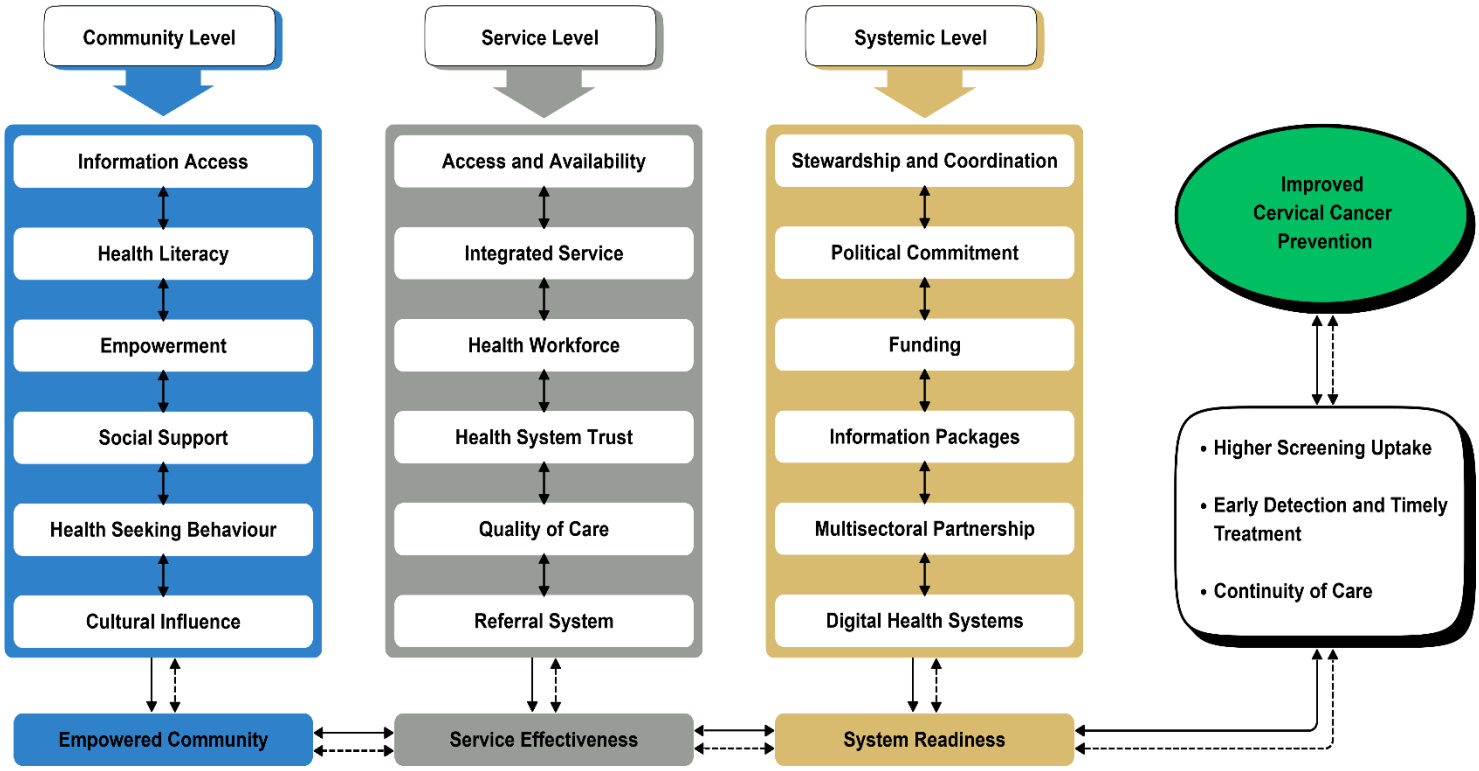


Figure 6.1. Community-based cervical cancer prevention model.

Source: Author (2025)

6.3.2.3.5. Underlying assumptions of the model

The community-based model for cervical cancer prevention is built on several underlying assumptions that reflect both the Namibian context and broader public health principles. These assumptions clarify how the model operates, moreover, what conditions are necessary for it to achieve its intended outcomes.

- The model assumes that sustainable cervical cancer prevention starts with informed and empowered communities. When individuals understand the causes, risks, and preventive measures, they are more likely to adopt healthy behaviours and seek vaccinations and early screening services.

- It is assumed that improving health literacy and personal empowerment enhances decision-making and motivation to participate in preventive care. Knowledge alone is not enough; individuals must also believe in their ability to act on that knowledge.

- The model assumes that people are more likely to seek and continue using services when they trust the healthcare system as well as experience compassionate, confidential, and culturally sensitive care.

- The model assumes that well-trained, motivated health workers and well-organised service structures are imperative for transforming community demand into actual service uptake. Without reliable access, awareness and motivation cannot translate into action.

- It is assumed that strong policies, effective partnerships, and sustainable financing are necessary to maintain the quality and continuity of prevention programmes. A supportive system ensures that local initiatives are not isolated or short-lived.

- The model operates on the assumption that continuous data collection, monitoring, and feedback across all levels lead to learning, adaptation, as well as improved outcomes. Evidence guides decision-making, ensuring that interventions remain responsive to community needs.

- The model assumes that collaboration across community, service, and systemic levels creates synergy, reinforcing the other. Community engagement fuels demand, services meet this demand, moreover systems sustain it through policy changes, leadership and resources.

- It is assumed that cervical cancer prevention must be equitable, reaching all women regardless of location, income, or social status. Initiatives that exclude rural or marginalised populations will limit national progress toward elimination.

6.3.2.4. Step 4: Validation and Application of the Model

The final step focused on validating and refining the model to ensure its credibility, clarity, and practical relevance. Chinn and Kramer (2023), postulate that validation involves a systematic evaluation of how well a model represents the real-world phenomenon it seeks to explain, while refinement ensures that the model is both theoretically sound and practically applicable. In this study, validation was achieved through expert review and guided by the assessment criteria adapted from Chinn and Kramer (2023). In simple terms, validation asks whether the model “makes sense” to the

people who would use it in their daily work, such as policymakers, healthcare workers, programme managers, as well as community representatives, in the context of the study.

This validation focused on three main goals:

1. To confirm that the model accurately reflects the realities of cervical-cancer prevention in rural Namibia.
2. To assess the clarity, relevance, and practicality of the model's concepts and relationships.
3. To refine and strengthen the model based on expert and user feedback.

6.3.2.1. Validation Approach

The validation was conducted adopting a single-stage participatory approach of expert reviews.

Expert Review Process

A panel of ten experts were selected through purposive sampling. They included medical officers, nurses, community health workers, public health practitioners, as well as health program officers. Each expert received a summary of the model, its structure (Figure 6.1), and a structured questionnaire, which served as the validation instrument for the model (Appendix 13). They were requested to rate the model on clarity, relevance, completeness, practicality, and logical flow, adopting a four-point Likert scale that ranged from "Strongly Disagree" (1) to "Strongly Agree" (4). Space was provided for additional written comments and recommendations.

Validation Criteria

The following five criteria, adapted from Chinn and Kramer (2023), were adopted by the experts to assess the model:

Table 6.4: **Validation Criteria**

Criterion	**Description**
Clarity	The extent to which the concepts, structure, and relationships within the model are well-defined and easy to understand.
Simplicity	The degree to which the model is logically organised and free of unnecessary complexity while still addressing the phenomenon effectively.
Generality	The applicability of the model across different but related contexts within Namibia or other low-resource settings.
Accessibility	The ease with which the model can be applied by different users such as health workers, programme managers, and policymakers.
Importance	The relevance and potential of the model contribute to improved cervical cancer

	prevention and broader public health outcomes.

Source: Author (2025)

6.3.2.2. Data Analysis

Validation data were analysed using both quantitative and qualitative approaches. For the quantitative analysis, numerical scores were manually converted into percentages of agreement. Agreement for each of Chinn and Kramer's five validation criteria was calculated by combining all responses marked as "Agree" and "Strongly Agree."

The percentage agreement was then determined using the formula: (Number of Agree + Strongly Agree responses ÷ Total responses) × 100. An 80% agreement threshold was adopted based on commonly used standards in model validation literature, where agreement above 0.80 is interpreted as strong content validity. Although a full Content Validity Index (I-CVI/S-CVI) calculation was not performed, percentage agreement provided an initial measure of conceptual acceptability among experts. In the qualitative analysis, written comments were reviewed multiple times to identify recurring ideas, which were then grouped into themes.

6.3.2.3. Ethical Considerations

All participants were informed about the purpose of the validation and provided written consent (Appendix 10) prior to participation. No identifying details were collected, and all responses were treated confidentially. Approval of the validation process was covered under the broader ethics clearance obtained for this PhD study.

6.3.2.4. Model Validation Findings

This section presents the results of the expert validation of the Community-Based Cervical Cancer Prevention Model. Ten participants completed the validation tool, which assessed the clarity, relevance, comprehensiveness and applicability of the model. Experts also provided written comments suggesting refinements.

6.3.2.4.1. Demographic Profile of Participants

Table 6.8 below depicts that ten experts participated in the model validation exercise. Most participants were between 35 and 54 years of age, comprising 70% of the sample, while only one participant was under 34 years of age. The group was predominantly female (70%), reflecting the gender profile commonly seen in reproductive health and public health professions in Namibia.

Half of the participants held a bachelor's degree, while the remainder had either a Master's (30%) or a Doctoral qualification (20%), showing that the panel consisted of individuals with advanced training and professional competence. In terms of professional roles, participants represented a mix of frontline and technical positions, including nurses and midwives (30%), medical officers (20%), public health practitioners (20%), academics (10%), and policy-level personnel (20%). This diversity ensured a balanced assessment of the model from both operational and strategic perspectives.

Participants were also highly experienced in cervical cancer or related fields. Most had more than 15 years of experience (60%), while others reported 10-15 years (30%) and 6-10 years (10%). This indicates that the validation exercise drew from a panel with strong practical knowledge and long-term involvement in service delivery and programme implementation.

The majority were affiliated with the Ministry of Health and Social Services (60%), followed by NGO/partner organisations (20%) and universities or research institutions (20%). This distribution reflects the key institutions involved in cervical cancer prevention in Namibia and ensures that the model was reviewed by individuals working at the frontline, in community outreach, in system management, and in academic settings.

Table 6.5: Demographic Characteristics of Model Validation Participants (N = 10)

Variables	Categories	Frequency (n)	Percentage (%)
Age (years)	18-34 years 35-44 years 45-54 years 55 years and above	1 3 4 2	10 30 40 20
Gender	Female Male	7 3	70 30
Highest qualification	Bachelor's degree Master's degree Doctoral degree Other (specify)	5 3 2 -	50 30 20 -
Current Professional Role	Nurse / Midwife Medical Officer Public Health Practitioner Academic/Researcher Policy Maker Other (specify):	3 2 2 1	30 20 20 10
Years of Experience in Cervical Cancer or Related Fields	1-5 6-10 10-15 15+	- 1 3 6	- 10 30 60
Organisation / Institution	MoHSS NGO/Partner organisation University/Research Institution Other (specify)	6 2 3 -	60 20 30 -

Source: Author (2025)

6.3.2.4.2. Quantitative Findings from the Validation Tool

Table 6.9 presents the agreement scores derived from the expert validation of the model using Chinn and Kramer's five evaluation criteria. Each criterion was assessed on a four-point Likert scale, and scores were converted into percentage agreement based on the proportion of experts who selected "Agree" or "Strongly Agree." These calculations provide a quantitative indication of how well the model meets the expected standards of clarity, simplicity, generality, accessibility and importance.

Table 6.6: Agreement Scores for Model Validation

Validation Criterion	Total Experts (N)	Agree + Strongly Agree (n)	Calculation	Percentage Agreement
Clarity	10	8	(8 ÷ 10) × 100	80%
Simplicity	10	9	(9 ÷ 10) × 100	90%
Generality	10	8	(8 ÷ 10) × 100	80%
Accessibility	10	8	(8 ÷ 10) × 100	80%
Importance	10	9	(9÷ 10) × 100	90%

Source: Author (2025)

Overall, the results show strong support for the model across all five criteria, with agreement levels ranging from 80% to 90%. The highest scores were recorded for simplicity and importance, both at 90%, indicating that experts found the model easy to understand and highly relevant for guiding cervical cancer prevention efforts. Clarity, generality, and accessibility each scored 80%, indicating consistent confidence in the model's structure, applicability across contexts, and ease of use. These high levels of agreement confirm that the model demonstrates good validity and is suitable for use in rural, low-resource settings.

6.3.2.4.3. Qualitative Findings: Expert comments, suggestions, and actions taken

The qualitative comments provided by the ten experts were analysed thematically. Five major themes emerged, each supported by clear explanations and direct quotations taken from the validation tool.

Theme 1: Clarity and Positioning of Concepts

Experts generally agreed that the model was clear and well-structured but recommended adjustments to strengthen the positioning of certain concepts. Several reviewers suggested that *Digital Health Systems* be placed at the systemic level rather than the service level, noting that digital tools depend on national infrastructure, policies and long-term resource allocation. As one participant explained:

- *"Digital tools rely on system-wide support. At the facility level, they can be used, but the decision and resources come from higher up."* (P5)

Experts also recommended moving *Social Support* earlier in the community pathway to reflect the strong influence of partners, families and peers on women's screening decisions. As one participant stated:

- *"Support from partners and families comes before the decision to seek care; it needs to appear earlier."*

Actions Taken:

- ✓ Digital Health Systems was shifted to the systemic layer to reflect national-level responsibility.
- ✓ Social Support was moved earlier within the community pathway to reflect its role in encouraging screening behaviour.

Theme 2: Strengthening the Flow of Arrows

Reviewers paid close attention to the directional arrows linking concepts and layers. They suggested that several connections should be bidirectional to show mutual influence. For example:

- *"Social support and behaviour influence each other. That arrow must go both directions."*
- *"Quality of care affects the workforce, and the workforce affects quality. It's not one-way."*

Experts also recommended strengthening the *feedback loops*, especially where outcomes should feed back into all three levels. One participant commented:

- *"Please make the feedback loop stronger."*

Actions Taken:

- ✓ Bidirectional arrows were added where mutual influence exists (e.g., workforce-quality, social support, health-seeking behaviour).
- ✓ A stronger feedback loop was added to illustrate continuous learning across community, service and system levels.

Theme 3: Language Refinement

Participants recommended adjusting several terms to align with the WHO's preferred language and field-level usage. Feedback was consistent across experts. Key suggestions included:

- "Policy commitment" → "Political will and commitment"
- "Sustainable financing" → "Health financing"
- "Data and research" → "Information packages", reflecting the tools used most often by frontline staff.

One participant explained:

- "What we use day to day are information packages. Data alone doesn't help us without tools."

Actions Taken:

- ✓ WHO-aligned terminology was applied across the model.
- ✓ Terms were revised to match how healthcare workers describe their work.
- ✓ Definitions were simplified and standardised across the glossary and the narrative description.

Theme 4: Overall Practicality and Usefulness of the Model

There was strong agreement that the model is practical and reflects real challenges and opportunities in rural Namibia. Experts felt that with minor refinements, it could be adopted for programme planning and community engagement. Key comments included:

- *"This model reflects the realities we work with every day. With minor refinements to the flow and labels, it will be very useful."*
- *"The community-service-system structure is clear and practical for planning cervical cancer programmes."*

Actions Taken:

- ✓ The final diagram was redesigned for easier interpretation by policymakers, district managers and community teams.

Theme 5: Visual Accessibility and Presentation

Experts emphasised the importance of making the visual design accessible, particularly in settings where materials are printed in black and white. They encouraged the use of contrasting borders, patterning and a clean hierarchy of layers.

Actions Taken:

- ✓ Borders and pattern fills were added for clarity.
- ✓ A legend was introduced to show the three layers, bidirectional arrows and feedback loops.

Overall, the expert comments significantly contributed to improving the clarity, relevance, and usability of the model. The refinements strengthened the connections between levels, aligned the terminology with WHO language and field practice, and enhanced visual accessibility. These changes helped produce a final model that is theoretically sound, contextually grounded and practical for use in rural cervical cancer prevention as depicted in Figure 6.1. The version of the model that was originally sent to the experts for validation is provided in Appendix 13 for comparison.

6.3.2.4.4. Discussion of the Model Validation Findings

The model validation process yielded a high level of agreement among experts that the proposed community-based cervical cancer prevention model is both conceptually sound and practically applicable in rural Namibian settings. The consistently high quantitative ratings across the five validation criteria indicate that the model is clear, relevant, applicable, and meaningful for programme implementation. Similar validation patterns have been reported in other health model development studies, where clarity and relevance were the strongest-performing criteria because they determine how easily users can understand and apply the model in real-world environments (Chinn & Kramer, 2023; Walker & Avant, 2019). The slightly lower agreement on generality and accessibility aligns with findings from prior community-based framework validations, where experts often recommend refinements to enhance adaptability across diverse rural contexts (Polit & Beck, 2021).

The qualitative feedback provided deeper insights into where and why adjustments were needed. Experts emphasised the importance of placing concepts in positions that accurately reflect their level of influence, which is consistent with guidance in health system modelling literature. For example,

digital health tools were viewed as more appropriate at the system level because their effectiveness depends on national governance, infrastructure, and financing. This aligns with WHO's classification of digital health as a system-level enabler rather than a community-level activity (World Health Organisation, 2019). Experts also highlighted the central role of trust in the health system. Evidence shows that trust influences service uptake, shapes patient-provider relationships, and is a strong determinant of screening behaviour, particularly in low-resource settings (Rasul et al., 2022). Strengthening its visibility in the model, therefore, aligns global findings on the behavioural drivers of preventive care.

Feedback on the arrows and model flow was equally important. Experts noted that certain relationships are bidirectional rather than linear, especially between behaviour and social support or between workforce performance and quality of care. This is consistent with the socioecological model, which emphasises reciprocal interactions between individuals, communities, and systems (Bronfenbrenner, 1994). Additionally, health system literature recognises that service quality and workforce capacity reinforce each other in ongoing cycles of improvement (Vasudevan et al., 2020). By incorporating more feedback loops, the model better reflects the dynamic nature of prevention efforts in rural environments. The suggestion to highlight these loops at all model levels is also supported by implementation science frameworks, which argue that cyclical feedback is essential for sustaining long-term health outcomes (Tracey, 2009).

Language refinement was another prominent theme. Experts recommended aligning terms with WHO terminology and the operational language used by health managers. This reflects the broader literature on model usability, which emphasises the importance of conceptual clarity and context-appropriate language for increasing uptake among frontline workers and policymakers (Miles et al., 2014). Substituting "policy commitment" with "political will and commitment," or framing "data and research" as "information packages," ensures that the model is not only theoretically accurate but also accessible to practitioners.

Overall, the qualitative feedback confirms that the model is practical, contextually relevant, and well-aligned with the existing literature on cervical cancer prevention in low-resource settings. Experts noted that its layered structure reflects how prevention programmes truly function from community behaviours to service delivery processes, to system-level governance and financing. The refinements suggested were minor and focused on improving clarity and usability rather than questioning the core design, which indicates that the model has strong conceptual validity and real-world applicability. This mirrors findings from similar models developed in other LMIC contexts, where multi-level, community-rooted designs have proven effective in guiding comprehensive prevention strategies (Shand et al., 2015; Catarino et al., 2018).

While the expert review provided important refinements, the validation process was limited to a single-round assessment and did not include Delphi iterations, structured Content Validity Index calculations, or pilot implementation testing. These advanced validation procedures are recommended for future postdoctoral research to further strengthen empirical verification of the model.

6.3.2.5. Distinction of the community-based prevention model from existing community and health system models

While the socio-ecological model and the WHO health systems framework have previously guided cervical cancer interventions in various settings, the model developed in this study differs in several important ways. First, rather than applying these frameworks conceptually, this model integrates them empirically, drawing directly from community-level, service-level, and system-level findings specific to rural Namibia. Second, existing models often focus either on behavioural change at the community level or on health system strengthening independently.

In contrast, the proposed model explicitly links sociocultural determinants such as male involvement, stigma, and misinformation with operational service delivery elements such as outreach consistency, referral systems, and workforce distribution. Furthermore, many community-based models in comparable settings rely heavily on externally funded campaigns or short-term mobilisation strategies. The present model embeds sustainability mechanisms, including governance structures, data feedback loops, and dedicated financing pathways, to reduce donor dependency and promote long-term system ownership.

6.4. Guidelines for operationalising the model

6.4.1. Purpose of the guidelines

These guidelines outline how the Community-based cervical cancer prevention model may be operationalised within routine health system structures, particularly in rural area such as Ohangwena and Kavango West. While large-scale implementation was beyond the scope of this doctoral study, the framework provides practical direction for translating the model's conceptual components into structured programme activities.

Although the model was developed using empirical evidence from two specific regions, its multi-level design supports adaptation to other rural settings in Namibia. The community, service, and system levels are intentionally structured to be context responsive rather than geographically confined. Foundational elements, including integration into primary health care services, male engagement strategies, decentralised outreach, and structured monitoring mechanisms, are transferable to districts facing similar barriers related to access, workforce capacity, and service coordination.

Thes study focused on model development and expert validation. Phased implementation, pilot testing, impact evaluation, and cross-regional comparison require dedicated implementation research and additional resource mobilisation, which are proposed as part of future postdoctoral work.

The recommendations are organised according to the three levels of the model: community level, service level, and systemic level, to enable health workers, district managers, community leaders, as well as policymakers understand their specific operational roles.

6.4.2. Principles Guiding Implementation

- ✓ Equity: Ensure that women in remote and underserved villages receive the same access to screening and vaccination as those in urban centers.

- ✓ Cultural sensitivity: All prevention messages and activities should respect local cultural norms, languages, and beliefs.
- ✓ Integration: Cervical cancer prevention should be incorporated into routine services such as ANC, FP, HIV care, school health, and community outreach.
- ✓ Community participation: Communities should be involved in planning, delivering, as well as assessing prevention activities.
- ✓ Evidence-based action: Data should be collected, analysed, as well as applied to guide local decision-making and improve service delivery.
- ✓ Sustainability: Activities should build long-term capacity, ownership, and financial stability within the health system.

6.4.3. Operational Framework by Model Layer

The guidelines specify what should be done, who should be responsible and what are their key roles, so implementers can operationalise the model without ambiguity.

Table 6.7: Operational framework by model levels

Model Levels	Operational Guidelines	Responsible Actors
Community	● Strengthen community education using local languages and culturally relevant media. ● Engage traditional, faith, and youth leaders to promote open dialogue on prevention. ● Establish peer-support groups and Cervical cancer health mbassadors' within villages. ● Encourage male involvement through community meetings and couples' health education. ● Use local radio and social networks to reinforce positive attitudes and health-seeking behaviours.	Community Health Workers (CHWs), traditional leaders, NGOs, peer educators, faith-based organisations
Service Delivery	● Integrate HPV vaccination, screening, and treatment within ANC, FP, and ART services. ● Strengthen training and mentorship for nurses and midwives in screening methods. ● Adopt digital health tools (SMS \reminders and teleconsultations) to improve follow-up and data use.	Nurses, Doctors, district hospital teams, training institutions, and the MoHSS PHC division.

	● Establish functional referral systems and ensure respectful, confidential care. ● Conduct regular outreach and mobile screening in remote areas.	
System	● Integrate cervical cancer prevention into regional and national health strategies. ● Strengthen data and research capacity for monitoring screening coverage and follow-up. ● Institutionalise district cervical-cancer task teams for coordination and supervision. ● Ensure dedicated and sustainable financing through annual health budgets. ● Enhance intersectoral collaboration between health, education, ICT, private and civil society sectors.	MoHSS, regional health directorates, district management teams, policymakers, partners

6.4.3.1. Roles and responsibilities of actors

To strengthen accountability and operational clarity, the specific roles of key actors are outlined below:

Community level actors

- Community Health Workers (CHWs): Lead household-level education, identify eligible women for screening, provide follow-up reminders, and link communities to facilities.
- Traditional and faith leaders: Facilitate community dialogue, reduce stigma, and endorse prevention messages within cultural and religious settings.
- Peer educators and NGOs: Conduct outreach campaigns, support awareness activities, and assist in monitoring community engagement indicators.

Service delivery level actors

- Nurses: Deliver screening and vaccination services, maintain quality standards, provide counselling, and ensure proper documentation.
- Doctors and district hospital teams: Oversee clinical management of abnormal results, supervise referral systems, and provide mentorship to CECAP staff.
- Training institutions: Integrate cervical cancer prevention competencies into curricula and support continuous professional development.

- MoHSS PHC division: Provide technical guidance, coordinate service integration, and monitor implementation performance at district level.

System level actors

- MoHSS (national level): Develop policy direction, allocate budgetary resources, and ensure alignment with national cancer control strategies.
- Regional health directorates: Coordinate implementation, supervise district performance, and ensure supply chain functionality.
- District management teams: Monitor local service delivery, and address operational bottlenecks.
- Partners and civil society organisations: Provide technical support, funding, innovation, and community mobilisation where required.

6.4.4. Stepwise Implementation Approach

Table 6.8: Stepwise Implementation Approach

Phase	Activities	Expected Outcomes
Phase 1: Orientation and capacity building	● Disseminate the model and guidelines to all stakeholders. ● Train health workers, managers, and community representatives. ● Establish pilot sites in selected districts. ● Conduct a small-scale feasibility assessment to evaluate acceptability, practicality, and early operational challenges before wider expansion.	Shared understanding and capacity for implementation.
Phase 2: Integration into existing services	● Incorporate cervical-cancer prevention activities into reproductive-health programmes. ● Begin community-led education and outreach campaigns. ● Link data reporting to DHIS2 indicators.	Prevention activities are embedded into routine health operations.
Phase 3: Scale-up and continuous improvement	● Expand to all districts. ● Institutionalise supportive supervision and data-driven decision-making.	Sustainable, system wide prevention services with improved coverage and quality.

	• Use quarterly review meetings for feedback and learning.	

6.4.5. Monitoring and Evaluation Mechanisms

To ensure accountability and learning, implementation must be accompanied by continuous monitoring employing measurable indicators. These indicators are aligned with core implementation science dimensions, including feasibility (can the model be delivered as intended?), acceptability (is it supported by providers and communities?), and readiness (are resources and systems in place?). Suggested key indicators include:

- ✓ Percentage of women screened for cervical cancer.
- ✓ Proportion of health facilities offering VIA/HPV screening services.
- ✓ Availability rate of screening supplies and trained personnel.
- ✓ Proportion of community members reached through awareness campaigns.
- ✓ Number of integrated service delivery points (e.g., ANC/FP clinics offering screening).
- ✓ Evidence of data utilisation in monthly or quarterly review meetings.

6.4.6. Expected Outcomes of Implementation

- ✓ Increased awareness and accurate knowledge about cervical cancer.
- ✓ Improved community trust and participation in screening programmes.
- ✓ Strengthened integration of screening services into routine health care.
- ✓ Enhanced capacity and motivation of frontline health workers.
- ✓ Effective data use and feedback for continuous improvement.
- ✓ A sustained decline in cervical-cancer incidence and mortality in rural Namibia.

6.4.7. Sustainability Considerations

- ✓ Institutionalise training on the model within health and academic curricula.
- ✓ Build capacity for local data analysis and decision-making.
- ✓ Strengthen local ownership through community health committees.
- ✓ Advocate for dedicated budget lines at district and regional levels.
- ✓ Encourage partnerships between government, NGOs, and the private sector for resource mobilisation.

These sustainability mechanisms recognise that long-term effectiveness depends not only on clinical interventions but also on institutional commitment, financing stability, and community ownership.

6.4.5.1. Indicator protocol framework

To the monitoring indicators are further structured according to definition, data source, frequency of measurement, and responsible level of implementation.

Table 6.9: Structured indicator protocol for model implementation

Domain	Indicator	Definition	Data source	Frequency	Responsible actor
Feasibility	Screening Coverage	Percentage of women screened within the past 12 months	DHIS2 facility reports	Quarterly	District Health Management Team
Feasibility	Service Availability	Proportion of health facilities offering VIA/HPV screening	Facility audit reports	Biannual	Regional Health Directorate
Readiness	Supply Availability	Availability rate of screening supplies and trained personnel	Stock registers and HR records	Quarterly	Facility Manager
Acceptability	Community Reach	Proportion of community members reached through awareness campaigns	CHW outreach records	Quarterly	Community Health Coordinators
Integration	Integrated Service Points	Number of ANC/FP clinics providing integrated cervical screening services	Facility service logs	Biannual	MoHSS PHC Division
System Strengthening	Data Utilisation	Evidence of cervical cancer data reviewed and used in planning meetings	Meeting minutes and district reports	Quarterly	District & Regional Teams

6.5. Summary

This chapter described the systematic process of developing, validating, and operationalising the community-based prevention model for cervical cancer management. Moreover, it commenced with concept identification and clarification, followed by the establishment of relationships between concepts, model description, validation, as well as the formulation of guidelines for operationalisation.

CHAPTER 7: CONCLUSION, UNIQUE CONTRIBUTIONS, STUDY LIMITATIONS AND RECOMMENDATIONS

7.1. Introduction

This chapter synthesises the key findings of the study and demonstrates how the research objectives were achieved. The study aimed to develop a community-based cervical cancer prevention model that integrates community empowerment, health service effectiveness, health system responsiveness, as well as policy support to strengthen cervical cancer prevention in the Ohangwena and Kavango West regions of Namibia. It outlines the study's scholarly contributions, acknowledges methodological limitations, and presents recommendations for practice, policy, and future research in cervical cancer prevention in rural Namibia.

7.2. Conclusion

This study sought to develop a community-based cervical cancer prevention model in the Ohangwena and Kavango West regions of Namibia. The study addressed the following objectives:

1) To assess community members' knowledge, attitudes, and practices (KAP) toward cervical-cancer prevention in the Ohangwena and Kavango West regions of Namibia.
2) To explore women's health-seeking behaviour for cervical cancer prevention in the Ohangwena and Kavango West regions of Namibia.
3) To examine the health-system challenges affecting cervical-cancer prevention in the Ohangwena and Kavango West regions of Namibia.
4) To develop a community-based cervical cancer prevention mode in the Ohangwena and Kavango West regions of Namibia.

The study demonstrates a structural knowledge-practice gap in which high general awareness coexists with limited depth of understanding regarding HPV infection, risk factors, and preventive measures. Moreover, knowledge was strongly associated with education level, region, and place of residence. Urban and more educated participants demonstrated better understanding than their rural counterparts. Although attitudes toward screening were generally positive, preventive practices remained low. Screening and HPV vaccination uptake were limited, indicating that favourable attitudes alone are insufficient to produce behavioural change in the absence of enabling structural conditions. This mismatch between positive attitudes and poor practices indicates that awareness alone is insufficient without accessible and supportive services.

Furthermore, women's health-seeking behaviour emerged as a multi-level phenomenon shaped by interacting with individual beliefs, sociocultural norms, and structural health-system conditions. While many women expressed willingness to seek screening, misconceptions, stigma, and fear discouraged them. Distance to health facilities, transport costs, as well as negative experiences with health workers further reduced participation. However, encouragement from nurses, peer influence, and family support emerged as strong motivators. The study concludes that women's preventive behaviour is conditionally dependent on both community support and system readiness.

The findings further indicate that cervical cancer prevention operates within systemic constraints that limit translation of awareness into preventive action. Moreover, services are largely facility-based, leaving rural clinics with limited capacity. Shortages of trained staff, inadequate funding, as well as weak data-management systems further constrain effective service delivery. Additionally, the absence of a dedicated national policy and insufficient community participation limit coordination and accountability. The study concludes that without strengthening these health-system blocks, community-level health services cannot be sustained. Critically, an inclusive approach that integrates governance, financing, workforce development, as well as community engagement is imperative for long-term success.

The study further concluded that the developed community-based cervical cancer prevention model provides an empirically grounded and context-responsive framework for improving cervical cancer prevention in Namibia. Furthermore, the model integrates community empowerment with strong health-system support, bridging the gap between awareness and action. It emphasises the importance of community participation, accessible services, as well as responsive governance as mutually reinforcing components. The model therefore serves as a comprehensive guide for policymakers and practitioners to strengthen cervical cancer prevention, promote equity, and move Namibia closer to achieving the WHO elimination targets.

7.3. Unique contributions to the body of knowledge

This study makes several original contributions:

1) Development of a contextualised community-based prevention model: The study developed a Community-Based Cervical Cancer Prevention Model grounded in empirical evidence from under-researched rural regions. In contrast to fragmented KAP-focused studies, the model integrates behavioural, structural, and system-level determinants into a unified framework, addressing a documented gap in contextually grounded implementation models in Namibia.

2) Integration of behavioural and health-system perspectives: The study advances theoretical synthesis by integrating the Health Belief Model, the Socio-Ecological Model, and the WHO Health-System Building Blocks framework. This theoretical integration advances understanding of how community knowledge, attitudes, and practices interact with systemic impediments to influence preventive health behaviours.

3) Empirical contribution from under-researched regions: The study contributes new primary data from Ohangwena and Kavango West, regions previously underrepresented in research.

4) New insights into women's health-seeking behaviour: The findings extend existing health behaviour theories by demonstrating that preventive actions are conditional upon social approval, trust in services, and structural accessibility.

5) Methodological contribution through model development: The study demonstrates how sequential mixed-method evidence can be synthesised systematically to generate a locally relevant theoretical model.

7.4. Study limitations

Although the study was carefully conducted, several limitations should be acknowledged.

- The study was conducted in only two rural regions. Findings may therefore not be statistically generalisable to all regions of Namibia.
- The sample size of 231 survey respondents provided useful insight; however, it may have limited statistical power for subgroup analyses.
- Regression analyses produced wide confidence intervals for some predictors, reflecting limited precision and potential model instability.
- Phase 1 employed multistage cluster selection followed by facility-based convenience sampling of individuals. This may have introduced selection bias toward individuals already engaged with health services, limiting statistical generalisability to all rural residents.
- The study employed a cross-sectional design, causal relationships cannot be inferred.
- Additionally, some information was self-reported and subject to recall or social desirability bias.
- Translation from Oshikwanyama and Rukwangali into English may have resulted in minor meaning shifts despite quality checks.

Despite these limitations, triangulation across quantitative and qualitative data strengthened analytic credibility.

7.5. Implication of the study findings

The study indicated that cervical cancer prevention remains a significant public health challenge in rural Namibia, as seen in many low-resource settings across Africa. Despite ongoing national efforts, gaps in knowledge, attitudes and screening practices are still evident, which may affect the development and implementation of effective prevention programmes. The results also revealed that the factors influencing women's uptake of screening and vaccination are complex and operate at individual, community and health-system levels. This is important for policymakers and programme managers because it highlights the need for interventions that are not only clinically sound but also socially acceptable, culturally sensitive and supported by strong service delivery systems.

Moreover, the findings pointed to weaknesses in how policy guidelines are translated into practice at the facility and community levels. Limited communication, inconsistent outreach, and inadequate engagement with rural women reduced participation in prevention activities and affected the overall ownership of services. There is a need to explore best practices that encourage local communities to take an active role in cervical cancer prevention, especially through the involvement of community health workers, traditional leaders and peer networks.

The study also revealed that trust in the health system, perceptions of service quality and past experiences strongly shape women's decisions to seek screening or follow referrals. These issues have received limited research attention in Namibia, yet they deeply influence health-seeking behaviour in rural communities. Further work in this area can contribute to a better understanding of how women navigate the system and may lead to more responsive, as well as community-based approaches to prevention. In addition, the findings revealed persistent system constraints such as staff shortages, equipment challenges, weak coordination and limited use of digital tools. These gaps affect the consistency and reliability of prevention services. Thus, research on how digital health solutions,

stronger referral pathways as well as improved supervision can support rural screening programmes and offer cost-effective and scalable strategies for Namibia and similar contexts.

7.6. Recommendations

Based on the study findings and the conclusions drawn, the following recommendations are made under three key areas: practice, policy and programme development, and future research, as described below:

7.6.1. Recommendations for Practice

- Provide respectful and confidential care**:** Healthcare workers should maintain dignity, privacy, and cultural sensitivity during screening to reduce fear, stigma, and mistrust that often discourage women from seeking care.
- Strengthen community-based health education**:** Community health workers may utilise local languages and community gatherings to convey clear, repeated messages about cervical cancer prevention, HPV vaccination, and early warning symptoms.
- Engage men and families in prevention efforts**:** Health workers should actively involve men in health-education sessions and couple-based communication to build family support for women's screening and vaccination decisions.

7.6.2. Recommendations for policy and programme development

- Develop and implement a national cervical cancer prevention policy: The MoHSS could establish a national policy and strategic plan that clearly outlines prevention targets, resource allocation, as well as intersectoral collaboration for cervical cancer control.
- Establish a dedicated and sustainable budget line: The MoHSS, in partnership with the Ministry of Finance, should allocate a specific annual budget for cervical-cancer screening, HPV vaccination, and community outreach to reduce dependence on donor funding.
- Establish dedicated budgets at district levels: The MoHSS and the Ministry of Finance should allocate specific budget lines for cervical-cancer prevention not only at the national and regional level, but also within district health offices. District-level funding autonomy will enable managers to plan outreach activities, purchase screening materials, moreover maintain essential supplies without requiring prolonged approval from central authorities.
- Expand outreach and mobile screening services: The Primary Health Care unit should coordinate regular outreach visits using mobile clinics and community health workers to reach remote areas with screening and vaccination services.
- Train, retain, and integrate cervical-cancer prevention into curricula: Training institutions and the MoHSS should collaborate to integrate cervical-cancer prevention, HPV vaccination, and CECAP skills into pre-service and in-service training curricula. Moreover, continuous education for nurses, doctors, and health extension workers should be prioritised, with incentives and professional development opportunities provided in rural areas to improve motivation and retention.

7.6.3. Recommendations for future research

- Evaluate the community-based cervical cancer prevention model in different settings: Researchers may assess and adapt the Community-Based Prevention Model in other Namibian regions and similar African contexts to measure its effectiveness and scalability.
- Conduct longitudinal and interventional studies: Future research should monitor long-term changes in knowledge, attitudes, as well as screening behaviours following the implementation of the community-based prevention model for cervical cancer management to assess sustainability and impact.
- Explore digital and innovation-based solutions: Academic institutions could investigate the use of mobile-health platforms, SMS reminders, and electronic data systems to strengthen follow-up, community education, and screening coverage.

7.7. Summary

The study demonstrates that effective cervical cancer prevention in rural Namibia requires synchronised action across community, service, and system levels. Knowledge gaps, behavioural hesitancy, and structural constraints interact to limit screening uptake despite favourable attitudes. The community-based cervical cancer prevention model provides an integrated framework linking community empowerment, service accessibility, and system strengthening. Although limited to two regions and a modest sample size, the study offers valuable evidence to inform policy, practice, and future research aimed at eliminating cervical cancer as a public health problem in Namibia.

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Appendices

Appendix 1: Interviewer-administered questionnaire

Knowledge, Attitudes, and Practices of community members in Ohangwena and Kavango West regions of Namibia towards cervical cancer prevention.

Information sheet for the respondents

This study aims to assess the community's knowledge, attitudes, and practices regarding cervical cancer and its prevention in your region. There are no right or wrong answers, and participation is anonymous, with no names or identity information required. Data collected will be confidential, stored securely, and identified only by code numbers. Participation is voluntary, and participants can decline without any consequences. No payment will be provided for participation. By signing below, you consent to participate in the study.

Would you like to participate in the study?

- ◯ Yes
- ◯ No

Section 1: General and demographic Information of respondents

1.1. How old are you?

- ◯ 18-24
- ◯ 25-34
- ◯ 35-44
- ◯ 45-54
- ◯ 55+

1.2. What is your gender?

- ◯ Female
- ◯ Male

1.3. What is your highest level of education you have completed?

- ◯ No education
- ◯ Primary
- ◯ Secondary
- ◯ Tertiary
- ◯ Literacy classes only

1.4. What is your employment status?

- ◯ Employed
- ◯ Unemployed
- ◯ Self employed

ire

1.5. what is your region?

- ◯ Ohangwena
- ◯ Kavango West

1.6. Where do you reside?

- ◯ Rural (village)
- ◯ Urban (town)

1.7. How far do you live from the nearest health facility (clinic, health center, district hospital)?

- ◯ Less than 5 Kilometers
- ◯ More than 5 Kilometers

1.8. Marital status

- ◯ Single
- ◯ Married
- ◯ Divorced or separated
- ◯ Widow/widower

1.9. Have you ever used any method of contraceptive to avoid getting pregnant or getting someone pregnant?

- ◯ Yes
- ◯ No

Why?

_____

1.10. Which contraceptive methods have you used?

More than one answer can be selected

- ☐ Intraunterine Device (IUD)
- ☐ Condoms
- ☐ Implanon
- ☐ Injectables
- ☐ Female sterilisation
- ☐ Pills
- ☐ Rhythm or calendar

1.11. How many children do you have?

- ◯ None
- ◯ 1-5
- ◯ 6-10
- ◯ 10+

1.12. Have you ever tested for HIV?

- ◯ Yes
- ◯ No

Why?

_____

1.13. Religious affiliation

2.2 Which of the following social media do you own? (PROBE and TICK all that apply)

- ○ Facebook
- ○ TikTok
- ○ Instagram
- ○ X (formerly known Twitter)
- ○ YouTube
- ○ WhatsApp
- ○ Other

Please specify?

_____

2.3 Have you ever heard about cancer?

- ◯ Yes
- ◯ No

2.4 Have you ever heard about cervical cancer?

- ○ Yes
- ○ No

2.5. Where did you first learn about cervical cancer? ((PROBE and Tick all that apply).)

- ☐ Newspapers and magazines
- ☐ Radio and Television (TV)
- ☐ Brochures, posters, Billboards and other printed materials
- ☐ Health workers
- ☐ Family, friends, neighbours and colleagues
- ☐ Teachers
- ☐ Religious leaders
- ☐ Social media (Whatsapp, facebook, instagram, X, TickTok)
- ☐ Other

Please explain

_____

2.6 Which of the following sources of information do you think can most effectively provide information on cervical cancer? (Please choose the three most effective sources))

- [ ] Healthcare professionals (doctors, nurses)
- [ ] Radio and Television (TV)
- [ ] Brochures, posters, Billboards and other printed materials
- [ ] Social media platforms (Facebook, Twitter, Instagram, etc.)
- [ ] Community health events
- [ ] Schools
- [ ] Churches
- [ ] Other

Please specify

_____

2.7. Have you ever heard about the Human Papillomavirus (HPV), the virus known to cause cervical cancer?

- ◯ Yes
- ◯ No

2.8 Have you heard about the Human Papillomavirus (HPV) vaccine?

- ◯ Yes
- ◯ No

2.9 Have you heard about the roll out of Human Papillomavirus (HPV) vaccine in Namibia?

- ◯ Yes
- ◯ No

2.10 Who should be vaccinated against Human Papillomavirus (HPV)?

- ◯ Male only
- ◯ Female only
- ◯ Both male and female

Section 3: Knowledge about cervical cancer and its prevention

3.1 What are some of the symptoms of cervical cancer that you know? (PROBE and TICK all that apply)

More than one answer can be selected

- [ ] Pain during sexual intercourse
- [ ] Bleeding in between periods
- [ ] Weight loss
- [ ] Foul smell discharge
- [ ] Postmenopausal bleeding
- [ ] Urinary urgency
- [ ] Other
- [ ] I do not know

Other (please specify):

_____

3.2. What are the known risk factors for cervical cancer?

More than one answer can be selected

- [ ] Having multiple sexual partners
- [ ] Having sex at an early age
- [ ] smoking cigarettes
- [ ] Use of oral contraceptives
- [ ] Acquiring Human Papillomavirus (HPV) infection
- [ ] Family history of cervical cancer
- [ ] Other
- [ ] I do not know

Other (please specify):

_____

3.3 Do you think cervical cancer can be prevented?

- ◯ Yes
- ◯ No

3.4. What cervical cancer preventive measures do you know? (PROBE and TICK all that apply)

More than one answer can be selected

- [ ] Avoid multiple sexual partners
- [ ] nothing can be done
- [ ] Quit smoking
- [ ] Vaccination against HPV
- [ ] Regular medical check ups for cervical cancer and HPV screening
- [ ] Avoid usage of oral contraceptives
- [ ] Other
- [ ] I do not know

Other (please specify):

_____

3.5 Which of the screening method in the picture can be carried out to detect cervical cancer? (PROBE and TICK all that apply)

- [ ] Visual Inspection with Acetic Acid (VIA)
- [ ] Pap smear test
- [ ] Visual Inspection with Lugol's Iodine (VILI)
- [ ] Other
- [ ] I do not know

Please explain

_____

3.6 Who should be screened for cervical cancer? (PROBE and TICK all that apply)

- [ ] All women age 25–50 who were ever sexually active if HIV-negative
- [ ] Women age 20–50 if HIV-positive.
- [ ] I do not know

3.7 How often should a woman be screened for cervical cancer?

- ◯ Once every year
- ◯ Once every 3 years
- ◯ Once every 5 years
- ◯ I do not know

3.8 Can cervical cancer be treated?

- ◯ Yes
- ◯ No
- ◯ I do not know

3.9 How can someone with cervical cancer be treated? (PROBE and TICK all that apply)

More than one answer can be selected

- [ ] Radiotherapy
- [ ] Surgery
- [ ] Chemotherapy
- [ ] Herbal remedies
- [ ] Praying
- [ ] Other
- [ ] I do not know

Other (please explain):

_____

3.10 What is the cost of cervical cancer treatment in Namibia?

- ◯ Free of charge
- ◯ Reasonable price
- ◯ Expensive
- ◯ I do not know

3.11 General Knowledge on cervical cancer prevention.

To what extent do you agree or disagree with the following statements? Please respond to the following questions by selecting " Strongly disagree (SD), Disagree (D), Neutral (N), Agree (A) and Strongly Agree (SA) "

_____

Statements	SD (1)	D(2)	N(3)	A (4)	SA (5)
3.11.1. All women have an equal chance of developing cervical cancer.	◯	◯	◯	◯	◯
3.11.2. Cervical cancer can be detected early by screening.	◯	◯	◯	◯	◯
3.11.3. Cervical cancer screening causes no harm to women.	◯	◯	◯	◯	◯
3.11.4. It is very important to consult doctor if there will be bleeding between periods.	◯	◯	◯	◯	◯
3.11.5. HPV vaccination can prevent cervical cancer.	◯	◯	◯	◯	◯
3.11.6. All women who develop cervical cancer must have their wombs removed.	◯	◯	◯	◯	◯
3.11.7. Cervical cancer would threaten a relationship with a sexual partner.	◯	◯	◯	◯	◯
3.11.8. I prefer a female health worker to conduct cervical examination	◯	◯	◯	◯	◯

Section 4: Attitude towards cervical cancer prevention

4.1 Attitude on cervical cancer prevention. *To what extent do you agree or disagree with the following statements? Please respond to the following questions by selecting " " Strongly disagree (SD), Disagree (D), Neutral (N), Agree (A) and Strongly Agree (SA) "*	SD (1)	D(2)	N (3)	A	SA
4.1.1. Women do not want to be seen in a cervical cancer screening clinic by my friends or colleagues.	◯	◯	◯	◯	◯
4.1.2. Cervical cancer screening is humiliating.	◯	◯	◯	◯	◯
4.1.3. Women have no time to go for cervical cancer screening.	◯	◯	◯	◯	◯
4.1.4. Cervical cancer screening is painful for.	◯	◯	◯	◯	◯
4.1.5. Some women are still too young to screen for cervical cancer.	◯	◯	◯	◯	◯
4.1.6. Partner is uncomfortable/would disagree.	◯	◯	◯	◯	◯
4.1.7. The healthcare facility is far from the place where a women live.	◯	◯	◯	◯	◯
4.1.8. Women fear the result might be positive.	◯	◯	◯	◯	◯
4.1.9. The healthcare facility does not provide cervical cancer screening services.	◯	◯	◯	◯	◯
4.1.10. The healthcare facility does not provide HPV vaccination services.	◯	◯	◯	◯	◯

Section 5: Practice of cervical cancer prevention

5.1 Do you know a women who ever screened for cervical cancer?

- ◯ Yes
- ◯ No

5.2 Has a health-care worker ever screened you for cervical cancer?

- ◯ Yes
- ◯ No

5.3 When was your last screening for cervical cancer?

- ◯ Less than 1 year ago
- ◯ 1–2 years ago
- ◯ 3–5 years ago
- ◯ More than 5 years ago
- ◯ I do not know

5.4 What was the result of your last screening for cervical cancer?

- ○ Normal/negative
- ○ Abnormal/positive
- ○ Did not receive result
- ○ I do not know

5.5 Where did you receive your last screening for cervical cancer?

- ○ Public Health facility
- ○ Outreach services
- ○ Private health facility
- ○ Others

Please specify

_____

5.6 What is the main reason you had your last screening for cervical cancer? (PROBE and TICK all that apply)

- ○ Part of routine examination
- ○ Follow up on abnormal or inconclusive result
- ○ Recommended by health-care provider
- ○ Experiencing pain or other symptoms
- ○ Other

Please specify

_____

5.7 What is the main reason you have never had a cervical cancer screening? (PROBE and TICK all that apply)

More than one answer can be selected

- ☐ It may be painful
- ☐ I feel shy
- ☐ I am healthy
- ☐ My partner would not allow me
- ☐ I am afraid a screening test would reveal cervical cancer
- ☐ The screening is expensive
- ☐ Did not know how or where to get treatment
- ☐ I have not just decided
- ☐ The healthcare facility is far from where i live
- ☐ Other

Please specify

_____

5.8 Would you be willing to collect a sample by yourself to test for cervical cancer either at a health-care clinic, or in your home, if you were given instructions on how to collect the sample?

- Yes
- No

5.9 Have you ever offered to take someone to cervical cancer screening?

- Yes
- No

5.10 Would you allow your partner to go for cervical cancer screening?

- Yes
- No
- Not sure

5.11 Would you allow a male healthcare worker to screen your partner for cervical cancer?

- Yes
- No

5.12 Given a chance to support your partner, would you encourage her to self-screen i.e. screening herself at home with a self-screening kit if it was easy to do?

- Yes
- No
- Not sure

5.13 Have you been vaccinated against HPV, the virus known to cause cervical cancer?

- Yes
- No

5.14 Would you allow your children aged 9-16 to be vaccinated against HPV?

- Yes
- No
- I do not have children, but if I did I would get her vaccinated
- I do not have children, but if I did I would not get her vaccinated

5.15 What are the reasons for not vaccinating your children?

- Using vaccines shows a lack of faith in the healing power of God
- The cervical cancer vaccine is harmful to health
- If you vaccinate young girls they will be sexually active too early
- It is morally wrong to vaccinate children for cervical cancer
- Other

Please specify

Acknowledgement

Thank you for taking the time to complete this questionnaire. Your input is valuable in improving awareness and preventive measures for cervical cancer management in your region. Have a wonderful day!!

Appendix 2: Data collection training manual

Training manual- Objective 1

1. Introduction

Purpose of the Survey

The purpose of this survey is to assess the knowledge, attitudes, and practices of community members towards cervical cancer and its preventive measures. This information will help inform public health strategies and interventions.

Objectives of Data Collection

- To gather accurate and reliable data from the community.
- To ensure a high response rate and comprehensive coverage.
- To maintain the integrity and confidentiality of the collected data.

Importance of Accurate Data Collection

Accurate data collection is crucial for:

- Making informed decisions based on reliable data.
- Understanding the community's needs and concerns.
- Developing effective public health policies and programs.

2. Roles and Responsibilities

Role of Data Collectors

As a data collector, you are responsible for:

- Administering the survey to selected participants.
- Recording responses accurately and completely.
- Ensuring ethical standards are upheld throughout the process.

Expectations and Responsibilities

- Be punctual and professional at all times.
- Follow the survey protocol strictly.
- Respect the rights and privacy of all participants.
- Report any issues or concerns to your supervisor promptly.

3. Survey Overview

Background Information

- Overview of cervical cancer and its impact on public health.
- Importance of preventive measures and early detection.

Target Population

- Community members aged 18-59 in the Ohangwena region.

Survey Methodology

- Random sampling of selected constituencies and health facilities.
- Face-to-face interviews using structured questionnaires.

4. Ethical Considerations

Informed Consent

- Explain the purpose and procedures of the survey to participants.
- Obtain verbal or written consent before proceeding.

Confidentiality

- Ensure that all participant information is kept confidential.
- Do not share personal data with unauthorized individuals.

Participant Rights

- Participants have the right to refuse or withdraw from the survey at any time.
- Respect their decisions without any consequences.

5. Data Collection Procedures

Preparation

- Familiarize yourself with the survey instrument.
- Ensure you have all necessary materials and equipment.

Conducting Interviews

- Approach participants respectfully and introduce yourself.
- Follow the questionnaire script and instructions carefully.
- Double-check entries for completeness.

Handling Sensitive Topics

- Approach sensitive questions with care and empathy.

- Allow participants to skip questions they are uncomfortable with.

6. Use of Tools and Equipment

Electronic Data Collection Devices

- Charge devices fully before going into the field.
- Backup data regularly to prevent loss.
- Make sure that you are clicking the submit button
- Ensure data is entered accurately and promptly.

7. Communication Skills

Building Rapport with Participants

- Be friendly and respectful to create a comfortable environment.
- Show genuine interest in their responses.

Effective Communication Techniques

- Use clear and simple language.
- Avoid leading questions or influencing responses.

Handling Difficult Situations

- Remain calm and professional if participants become upset.
- Seek assistance from your supervisor if needed.

8. Quality Control

Ensuring Data Accuracy

- Review each completed questionnaire for completeness.
- Correct any errors immediately.

Common Errors and How to Avoid Them

- Misinterpretation of questions: Clarify if needed.
- Incomplete responses: Ensure all questions are answered.
- Regularly review data entries for accuracy.
- Correct any discrepancies as soon as they are identified.

9. Health and Safety Guidelines

Personal Safety in the Field

- Be aware of your surroundings and avoid risky areas.
- Travel in pairs if possible.

Emergency Procedures

- Know the emergency contact numbers and procedures.
- Report any incidents to your supervisor immediately.

10. Field Logistics

Travel Arrangements

- Plan your travel route and schedule in advance.

Daily Reporting

- Provide daily updates to your supervisor on progress and challenges.

11. FAQs and Troubleshooting

Common Questions and Answers

- What if a participant refuses to answer a question? Respect their decision and move on to the next question.
- How do I handle technical issues with electronic devices? Report any technical issues to your supervisor immediately.

CONTACT INFORMATION FOR SUPERVISOR: ELIZABETH NDAKUKAMO-KASINO (0813488130)

Appendix 3: Focus Group Discussion Guide

Theme 1: Factors influencing health-seeking behavior.

a) What are your perceptions about cervical cancer and its severity? *Can you describe any personal experiences or encounters with cervical cancer?*

b) How do you decide when to seek healthcare services for cervical cancer-related concerns? Probe: *Are there specific symptoms or warning signs that prompt you to seek medical attention? Any past experiences or instances where you delayed seeking healthcare for cervical cancer-related issues?*

Theme 2: Experiences with healthcare providers.

a) Can you share your experiences with healthcare providers regarding cervical cancer vaccination, screening, or treatment? Probe: *How satisfied are you with the quality of care you receive? Have you encountered any barriers or challenges when interacting with healthcare providers? Have you experienced any structural barriers, such as the limited availability of screening facilities or treatment centers, that impede your access to cervical cancer healthcare services?*

Theme 3: Cultural beliefs, practices, and preventive health behaviors.

a) How do cultural beliefs and practices influence your perceptions and behaviors related to cervical cancer? Probe: *Can you discuss any traditional or alternative methods you use for cervical cancer prevention or treatment? Discuss any misconceptions or myths about cervical cancer that may prevent individuals from seeking screening or treatment. Does fear or anxiety about potential diagnosis or treatment outcomes influence your decision-making process regarding cervical cancer healthcare?*

b) What role do family, friends, or community play in shaping your health behaviors regarding cervical cancer? Probe: *Have you received support or encouragement from your social network to engage in cervical cancer screening or treatment?*

Theme 4: Barriers to accessing cervical cancer services.

a) What are some challenges you face in accessing healthcare services for cervical cancer? Probe: *financial barriers you encounter when accessing healthcare services for cervical cancer, transportation issues. Are there any language barriers that affect your communication with healthcare providers or understanding of cervical cancer-related information, challenges related to long wait times, and availability of CC services and healthcare providers? Have you experienced difficulties navigating the healthcare system or obtaining referrals for cervical cancer screening or treatment?*

b) How do societal norms and stigma impact your willingness to engage in cervical cancer prevention and treatment efforts? Probe: *How do you think societal attitudes towards cervical cancer impact women's access to information and resources for prevention and treatment? Changes you would like to see in societal attitudes towards cervical cancer to improve prevention and treatment efforts.*

c) Explain what can be done to improve the delivery of cervical cancer services to women in your community. Probing: *What suggestions do you have for improving the accessibility, availability, acceptability, and affordability of cervical cancer services? Are there any strategies or approaches that would encourage more women to seek cervical cancer care?*

Appendix 4: In-depth Interview Guide

Question	Coding category
1.1. Gender	1. Female 2. Male
1.2. Education level	1. Primary education 2. Secondary education 3. Diploma 4. Bachelor's degree 5. Master's degree 6. Doctoral degree
1.3. Occupation:	1. Healthcare provider (specify role: e.g., physician, nurse, community health worker) 2. Policymaker/government official 3. NGO representative 4. Researcher/academic
1.4. Years of Experience in Healthcare	1. Less than one year 2. 1-5 years 3. 6-10 years 4. More than ten years
1.5. Geographic Location:	1. Urban 2. Rural
1.6. Level of Healthcare Facility:	1. Primary healthcare center 2. District hospital 3. Regional offices
1.7. Affiliation/Organization:	1. Government 2. Non-Governmental Organisation

	3. Academic institution 4. others, specify_____

1. **Can you describe the available strategies/ activities to prevent cervical cancer in your healthcare facility?** (*How readily available are cervical cancer prevention services, including HPV vaccination and screening, in your facility or community? Are there any specific challenges or gaps in service availability that affect women's access to cervical cancer prevention measures?*

    a. **What are your main challenges in delivering cervical cancer prevention?**

(*Probe how accessible cervical cancer prevention, diagnosis, and treatment services are in terms of geographic location and physical accessibility. Are there barriers such as transportation challenges or long waiting times hindering women's access to these services? Are there any cultural or social factors influencing women's willingness to seek or utilize these services).*

b. **Explain some community support structures for cervical cancer prevention and care available in the community**. *(Probe: How are women in the community informed about the availability and importance of cervical cancer prevention services? Are there any health education and promotion initiatives to raise awareness about cervical cancer risk factors, screening options, and treatment modalities?).*

c. **What are the main barriers that women face in accessing and utilizing cervical cancer prevention, diagnosis, and treatment services?**

2. **What is the availability of trained healthcare professionals to deliver cervical cancer prevention services in your facility?** *(probe: How many healthcare professionals in your facility are trained to provide cervical cancer prevention services, including HPV vaccination and screening, and how do workload and staffing shortages impact the delivery of cervical cancer prevention services*

    a. **What training and support mechanisms are in place to enhance healthcare workers' capacity to provide cervical cancer prevention services?** *(probe; if there are any specific training programs or certifications available for healthcare professionals to improve their skills in cervical cancer prevention, strategies are in place to ensure continuous training and professional development for healthcare professionals involved in cervical cancer prevention).*

3. **How is data on cervical cancer prevention activities collected, recorded, and monitored in your healthcare facility?**

(Probe for How is data used to inform decision-making and improve the delivery of cervical cancer prevention services)

a. What are the main challenges or gaps in the health information system related to cervical cancer prevention? *(probe for gaps in the health information system related to tracking HPV vaccination coverage, cervical cancer screening rates, and follow-up care).*

4. **Have there been any challenges related to procuring, maintaining, or utilizing cervical cancer screening and diagnostic equipment?** *(Probe: what types of screening and diagnostic equipment are available for cervical cancer prevention in your facility, including HPV testing and Pap smears? Have any challenges related to this equipment's procurement, maintenance, or utilization?)*

5. **What are the main financial constraints or challenges in implementing cervical cancer prevention services?** *(Probe: what is the current budget allocated for cervical cancer prevention services, including HPV vaccination and screening initiatives? How is funding allocated for cervical cancer prevention activities within your healthcare facility or program?).*

    a. **Are there any specific financial constraints or challenges that impact the delivery and sustainability of cervical cancer prevention programs in your facility?**

6. **What is Namibia's current policy and regulatory framework governing cervical cancer prevention?** *(Prove the key challenges or gaps in leadership and governance that affect the implementation of cervical cancer prevention strategies?)*

Appendix 5: Validation tool

PART A: Demographic Information

Please read each question carefully and place an "X" in the box that best describes you. Choose only one option per question.

1.1. Age

☐ 18-34 years

☐ 35-44 years

☐ 45-54 years

☐ 55 years and above

1.2. Highest qualification

☐ Bachelor's degree

☐ Master's degree

☐ Doctoral degree

☐ Other (specify): _____

1.3. Current professional role

☐ Nurse / Midwife

☐ Medical Officer

☐ Public Health Practitioner

☐ Academic/Researcher

☐ Policy Maker

☐ Other (specify): _____

1.4. Years of experience in cervical cancer prevention or related fields

☐ Less than 5 years

☐ 5-9 years

☐ 10-14 years

☐ 15 years and above

1.5. **Organisation / Institution**

☐ MoHSS

☐ NGO/Partner organisation

1

☐ University/Research Institution

☐ Other (specify)

PART B: Validation questions

Read the description of the model in Part 1 (and review Figure 1) carefully. Then, use the scale provided in each question below to evaluate the model in terms of clarity, simplicity, generality, accessibility, and importance. Put a cross (×) in the box next to your answer.

Question 1: Clarity of the model

The concepts and structure of the model are clearly defined, consistent, and logically interconnected.

Agree	Strongly agree	neutral	disagree	Strongly disagree

Comment:

.....

.....

Question 2: Simplicity of the model

The model explains cervical cancer prevention using the essential concepts only, without unnecessary complexity.?

Agree	Strongly agree	neutral	disagree	Strongly disagree

Comment:

.....

.....

Question 3: Generality of the model

The model is applicable in different rural regions of Namibia and similar low-resource contexts.

Agree	Strongly agree	neutral	disagree	Strongly disagree

Comment:

.....

.....

Question 4: Accessibility of the model

The model is easy to understand and use by health workers and policymakers.

Agree	Strongly agree	neutral	disagree	Strongly disagree

Comment:

.....

.....

Question 5: Importance of the model

The model addresses a significant problem and provides practical guidance for improving cervical cancer prevention.

Agree	Strongly agree	neutral	disagree	Strongly disagree

Comment:

.....

.....

Question 6: Suggestions for Improvement

What improvements would you suggest to strengthen the model's clarity, relevance, or application?

Comment:

.....

.....

.....

.....

.....

.....

THE END

Appendix 6: Ethical approval (NUST)

NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY
Faculty of Health, Natural Resources and Applied Sciences
School of Health Sciences

13 Jackson Kaujeua Street
Private Bag 13388
Windhoek
NAMIBIA

T: +264 61 207 2970
F: +264 61 207 9970
E: dchs@nust.na
W: www.nust.na

FACULTY OF HEALTH, APPLIED SCIENCES AND NATURAL RESOURCES

DECISION/FEEDBACK ON RESEARCH PROPOSAL ETHICAL CLEARANCE

Dear Prof/Dr/Mr/Ms/Other(s): Elizabeth Kaleinasho Ndakukamo

Student No (if applicable): 9862609

Research Topic:	Development of a Community-Based Prevention Model for Cervical Cancer Management in Ohangwena and Kavango West Regions, Namibia
Supervisor (if applicable):	Dr. Roswitha Mahalie
Co-supervisor(s): if applicable	Dr. Panduleni Hailonga-Van Dijk
Qualification registered for (if applicable):	Doctorate in Health Sciences

Re: Ethical screening application No: FHNRAS:58/2023

The Research Ethics Screening Committee has reviewed your application for the above-mentioned research project. Based on the recommendation of the expert reviewer, the research as set out in the application is hereby:

(Indicate with an X)

Approved: i.e. may proceed with the project	X	
Approved provisionally: i.e. may proceed but subject to compliance with recommendation(s) listed below		
Not approved: Not to proceed with the project until compliance with recommendation(s) listed below and resubmit ethics application for consideration		
IS MINISTRY OF HEALTH & SOCIAL SERVICES (MoHSS) APPROVAL REQUIRED?	YES: X	NO:

It is important to note that as a researcher, you are expected to maintain ethical integrity of your research, strictly adhere to the ethical policy of NUST, and remain within the scope of your research proposal and supporting evidence as submitted to the REC. Should any aspect of your research change from the information as presented, which could have an impact or effect on any research participants/subjects/environment, you are to report this immediately to your supervisor or REC as applicable in writing. Failure to do so may result in withdrawal of approval. Kindly consult your supervisor or HoD if you need further clarification.

Appendix7:Ethicalapproval(MoHSS)

REPUBLIC OF NAMIBIA

MINISTRY OF HEALTH AND SOCIAL SERVICES

Ministerial Building
Harvey Street
Private Bag 13198, Windhoek

OFFICE OF THE EXECUTIVE DIRECTOR

Tel: No: 061 -203 2507
Fax No: 061-222 558
Andreas.Shipanga@mhss.gov.na

Ref: 22/3/1/2
Date: 26 January 2024

Enquiries: Mr. A. Shipanga

Ms. Elizabeth K. Ndakukamo
NUST
Windhoek

Dear Ms. Ndakukamo

Title: Development of a Community-based prevention model for cervical cancer management in Ohangwena and Kavango West Regions, Namibia.

1. Reference is made to your application to conduct the above study.
2. The proposal has been evaluated and found to have merit.
3. **Kindly be informed that permission to conduct the study has been granted under the following conditions:**
   - 3.1 The data to be collected must only be used for academic purposes;
   - 3.2 No other data should be collected other than the data stated in the proposal;
   - 3.3 No any specimen should be collected from Human Subjects;
   - 3.4 Stipulated ethical considerations in the protocol related to the protection of Human Subjects' information should be observed and adhered to; any violation thereof will lead to termination of the study at any stage;
   - 3.5 A quarterly report to be submitted to the Ministry's Research Unit;
   - 3.6 Preliminary findings to be submitted upon completion of the study;
   - 3.7 Final report to be submitted upon completion of the study;
   - 3.8 Separate permission should be sought from the Ministry for the publication of the findings.
4. All the cost implications that will result from this study will be the responsibility of the applicant and **not** of the MoHSS.

Yours sincerely,

BEN NANGOMBE
EXECUTIVE DIRECTOR

Appendix 8: Data collection permission letter (Ohangwena region)

REPUBLIC OF NAMIBIA

MINISTRY OF HEALTH AND SOCIAL SERVICES

RMT - Eenhana
Private Bag 88006
Eenhana

OHANGWENA HEALTH DIRECTORATE
OFFICE OF THE DIRECTOR

Tel: No: 065 – 263260/239
Fax No: 065 – 263063
Email: geotho2@gmail.com

Enq: George T. Jeremia

15 March 2024

To: **Ms. Ndakukamo Elizabeth**
Course: Ph. D
Student – NUST- Whk

RE: APPLICATION FOR PERMISSION TO CONDUCT ACADEMIC STUDY AT THE DISTRICT HOSPITALS IN THE OHANGWENA REGION

1. The abovementioned subject bears reference.
2. The Ohangwena Health Directorate is hereby delighted to grant you permission to conduct your study titled: ***Development of a Community – Based Prevention Model for Cervical Cancer Management in Ohangwena and Kavango west regions, Nambia***
3. This permission is granted on condition that you adhere to the rules as stipulated in approval letter from the Ministry's Research Unit.
4. Please, ensure that when at District hospitals, you are required to report yourself to the Office of the Senior Medical Officers to direct you accordingly. Note also that this permission is granted only within Ohangwena Health Region.
5. We wish you success in your work and hope the research will generate data that will be beneficial to the professional by proposing workable solution to better manage cervical cancer in Namibia. Please share also your findings and recommendations with the office of the Regional Director.

Kind regards

.....
GEORGE T. JEREMIA
ACTING REGIONAL DIRECTOR
OHANGWENA REGION

MINISTRY OF HEALTH AND SOCIAL SERVICES
OFFICE OF THE DIRECTOR
OHANGWENA REGION
15 MAR 2024
Private Bag 88006 Eenhana
Tel: 065-263260
Fax: 065-263064
REPUBLIC OF NAMIBIA

All official correspondences must be addressed to the

My NAMIBIA
MY COUNTRY, MY PRIDE

Appendix 9: Data collection permission letter (Kavango West region)

REPUBLIC OF NAMIBIA

MINISTRY OF HEALTH AND SOCIAL SERVICES

Private Bag 2099
RUNDU
NAMIBIA

Kavango West Region
Nkurenkuru - RMT
Email:nataliamwiza17@gmail.com

Tel: No: 066 – 258064/5
Ext: 200
Cell: 0813348193

Enquiries: N. Kapundura

Ref. No :

16 May 2024

OFFICE OF THE REGIONAL DIRECTOR

TO: NAMIBIA UNIVERSITY OF SCIENCE AND TECHNOLOGY
LECTURE: HEALTH INFORMATION SCIENCE
DEPARTMENT: PREVENTATIVE HEALTH SCIENCES

ATT: Elizabeth Ndakukamo

RE: APPROVAL FOR COLLECTING DATA: FROM DISTRICT HOSPITAL IN KAVANGO WEST TO IMPROVE AND PROMOTE CERVICAL CANCER PREVENTION, KAVANGO WEST REGIONS NAMIBIA

With reference to the email received 15 March 2024, requesting for approval to collect data from three (3) district hospitals in Kavango West for a Ph.D. project to improve and promote cervical cancer prevention.

Approval is hereby granted to collect data in Kavango West during the period of the research. However, Kavango West region only has one (1) district hospital namely the Nankudu Hospital and Six (6) Health center. From the 6 health centers two (2) are in Ncamagoro district and four (4) in Nkurenkuru district, therefore there are specific sites that offer the cervical screening services in the region.

With believe that the data collected will contribute to positive outcomes in the Region.

Yours in Health

Yours sincerely

FRANSISKA K. HAMUTENYA
REGIONAL DIRECTOR

MINISTRY OF HEALTH AND SOCIAL SERVICES
2024 -05- 16
REGIONAL DIRECTOR

All Official correspondence must be addressed to the Regional Director

My NAMIBIA MY COUNTRY, MY PRIDE

Appendix 9: Informed consent

I ----------have read the information sheet given to me by Ms Elizabeth Ndakukamo. I understand that she is conducting a research study for her PhD. I understand what is required of me, and I have had all my questions answered. I am not forced to participate in this study, and I am doing so of my own free will. I know that I can withdraw at any time if I so wish and that it will have no dire consequences for me. I understand the findings will be published in peer-reviewed journals and presented on various platforms without using my name.

I also accept the above

Signed:

---------- ----------

Participant Date and place

---------- ----------

Researcher Date and place

Thank you very much for your support!

Appendix 11: Journal Article 1 (Published): Objective one

International Journal of Sub-Saharan African Research (IJSSAR)
Vol. 3, Issue 2, pp. 15-29, June 2025, ISSN: 3043-4467 (Online), 3043-4459 (Print)
DOI: 10.5281/zenodo.15777503

Cervical Cancer Prevention in Rural Namibia: A Cross-Sectional Analysis of Community Knowledge, Attitudes, and Practices in Ohangwena and Kavango West

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[1]https://orcid.org/0009-0007-6682-0983
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***Corresponding author:** ndakukamoe@gmail.com

ABSTRACT

Background: Cervical cancer remains a leading cause of cancer-related deaths among women globally. In Namibia, cervical cancer often goes undetected despite its prevention through early detection. Women in rural areas face barriers to screening due to limited access to preventive services, inadequate knowledge, and cultural stigmas, leading to high morbidity and mortality.
Objective: The study assessed knowledge, attitudes, and practices regarding cervical cancer prevention among the community of the Ohangwena and Kavango West regions in Namibia.
Method: This cross-sectional study was conducted in various health facilities across these regions. Using purposeful sampling, 228 respondents aged 18-59 participated. Data were collected using a structured questionnaire and analysed with SPSS version 29.
Results: The findings reveal a moderate level of knowledge of cervical cancer but limited awareness about human papillomavirus, with respondents generally showing a positive attitude toward prevention. However, respondents demonstrated poor screening practices.
Conclusion: While the knowledge of cervical cancer is relatively high, significant gaps remain in knowledge regarding human papillomavirus. Positive attitudes towards cervical cancer screening are uplifting. However, structural and cultural barriers impede preventive practices.
Unique Contribution: This study provides localised evidence on cervical cancer prevention by examining the knowledge, attitudes, and practices of rural communities in Ohangwena and Kavango West, Namibia. It adds to the limited research on rural populations and identifies key cultural, informational, and systemic barriers to effective prevention. The findings offer a foundation for context-specific interventions and informed public health efforts to improve community engagement in screening and human papillomavirus awareness.
Key Recommendation: The findings indicate the potential value of implementing community-based education initiatives that emphasise awareness and the importance of regular screening. Furthermore, integrating cervical cancer education into routine primary healthcare services and school health programmes may support efforts to address existing knowledge gaps and promote early prevention practices within rural settings.

Keywords: Cervical Cancer, Knowledge, Attitudes, Practices, Rural Namibia

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INTRODUCTION

Every two minutes, a woman's life is claimed by cervical cancer globally (WHO African Region, 2024a). Cervical cancer, primarily caused by specific strains of the human papillomavirus (HPV), is the leading cause of cancer deaths among women in Africa (World health organisation, 2023). Of the 20 countries with the highest global burden, 18 are located within the Sub-Saharan African (SSA) region (WHO African Region, 2024b). In 2022, the region accounted for 23% of global cervical cancer mortality. If the current trend continues, this percentage might rise to 30% by 2030, a 32% increase from the current level (WHO African Region, 2024b). According to current estimates from the International Agency for Research on Cancer, the age-standardised cervical cancer mortality rate in Southern Africa is 21 per 100,000 women, while the rate in North America and Western Europe is 2 per 100,000 women (International Agency for Research on cancer, 2022). It is anticipated that these disparities are expected to rise. Cervical cancer remains the leading cause of cancer-related deaths in Namibia, accounting for 34.2% of these fatalities (MacBride, 2023a). Cancer of the cervix progresses slowly from the precancer stage to invasive cancer. Thus, unlike most other cancers, cervical cancer is one of the most preventable when detected at its early stages. This presents a hopeful opportunity for change, empowering all stakeholders who play a role in preventing cervical cancer to take proactive steps in prevention (WHO African Region, 2024b).

The larger context of cervical cancer inequality is outside the purview of this article. However, the wide variations in cervical cancer incidence and mortality between low- and middle-income countries (LMICs) such as Namibia and high-income countries (HICs) can be primarily ascribed to disparities in healthcare access more broadly, as well as to obstacles to cervical cancer screening and treatment. These obstacles include such as lack of awareness that cervical cancer is preventable, lack of the HPV vaccine, inadequate clinical and laboratory healthcare workers, poor-resourced health facilities, sociocultural factors, as well as geographic issues.

The prevalence and incidence of cervical cancer in Namibia have exhibited concerning trends, such as a steady increase in the number of new cases and a high mortality rate, similar to other SSA nations (MacBride, 2023b). The significant increase in cervical cancer cases is primarily attributed to the high prevalence of Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS), which exceeds 12.6%. This places women in Namibia at a heightened risk for HPV-related cancers, underscoring the urgent need for comprehensive health interventions to address this issue (Ministry of Health and Social Services [Namibia], 2017). Population-based screening with a Papanicolaou (Pap) Smear test and Visual Inspection using Acetic acid (VIA) are crucial secondary preventive measures for cervical cancer. These interventions have been proven to lead to a high cure rate among cervical cancer patients, underscoring the vital role of public health interventions in this field (World Health Organisation, 2023). These screening methods are provided free of charge at the facilities where the study has been carried out. Despite the availability of screening services, cervical cancer remains a public health burden in the country (MacBride, 2023b). To date, Namibia does not offer HPV screening and vaccine services, a primary means of preventing cervical cancer, mainly due to limited resources, high costs of HPV tests, and a lack of laboratory infrastructure.

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In addition, there is no fully implemented national policy for HPV DNA testing in the country (Ministry of Health and Social Services [Namibia], 2017).

Studies in various countries, such as Kenya (Gebreegziabher et al., 2024) and South Africa (Omoyeni & Tsoka-Gwegweni, 2022) have identified factors that can predict the utilisation of cervical cancer prevention practices and found that the lack of knowledge of cervical cancer and its prevention is a reason for women not practising screening. A scoping review to collect national cervical cancer policy documents from countries in the World Health Organisation Africa region concluded that women generally have low knowledge about reproductive cancers (Akanda et al., 2022). The report further noted a lack of spousal support, limited community education, and a lack of awareness campaigns, with multiple myths persisting within the communities as reasons for the low screening uptake (Akanda et al., 2022). Moreover, numerous factors that hinder access to screening services and early cancer detection, including lack of information, ignorance, cultural beliefs surrounding reproductive cancer, and barriers within the healthcare system, were also highlighted in another report (Nyambe et al., 2019a). On the contrary, awareness of cervical cancer resulted in positive attitudes and good practices toward screening among Nigerian women (Olubodun et al., 2019). Based on these findings, we assumed that women who are aware of cervical cancer are most likely to practice preventive measures, and men are equally able to support women to do so. Research conducted in Rwanda (Uwimana et al., 2023) found that a woman's partner influenced household decision-making, including healthcare seeking. This evidence suggests that women who believe they have support from their immediate social circles (partner, friends, family) are more likely to be in favour of practising cervical cancer prevention methods.

The knowledge, attitude, and practice of preventing cervical cancer among women have been extensively studied in other countries (Damtie et al., 2023). However, studies of this nature are limited in Namibia, as no published study has assessed the knowledge, attitude, and practice of cervical cancer prevention, specifically in the Ohangwena and Kavango West regions. Additionally, the available literature on cervical cancer does not cover the extent of men's knowledge, attitudes, or their participation in the prevention of cervical cancer. Thus, the specific objective of the study was to assess the knowledge, attitudes, and practices regarding cervical cancer among community members in the Ohangwena and Kavango West regions of Namibia.

METHOD

This study utilised a cross-sectional design to assess knowledge, attitudes, and practices (KAP) related to cervical cancer prevention among community members aged 18–59 in six rural constituencies across Ohangwena and Kavango West regions of Namibia, selected based on high cervical cancer burden and limited screening access. A sample size of 384 was calculated using Cochran's formula for infinite populations, assuming a 50% proportion ($p = 0.5$), a 95% confidence interval (Z_1-$\alpha/2 = 1.96$), and a 5% margin of error. However, only 228 participants were ultimately enrolled due to eligibility constraints and refusals, resulting in an adjusted margin of error of approximately 6.5%. A multi-stage sampling strategy was used: constituencies were selected via the fishbowl simple random sampling method, while health facilities were

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purposively chosen as recruitment sites. Participants were then purposively selected based on inclusion criteria (≥6 months residency and informed consent). Data were collected using an interviewer-administered questionnaire built in Kobo Toolbox, adapted from the CCKP-64 and CAM instruments, and pretested for feasibility and clarity, achieving a Cronbach's alpha of 0.84. Data were exported to Excel, cleaned, and analysed in SPSS v29 using descriptive statistics and logistic regression. Knowledge and attitude scores were categorised as good (≥70%), moderate (50–69%), or poor (<50%). At the same time, practice was assessed through a single item: female participants who had been screened or male participants who had supported screening were classified as having good practice. This methodology provides a replicable model for similar KAP studies in rural, resource-limited settings.

RESULTS

Table 1: Socio-demographic characteristics of study respondents

Predictors	Categories	Frequency	%
Age	18-24	69	30.3
	25-34	77	33.8
	35-44	59	25.9
	45-59	23	10.1
Gender	Male	69	30.3
	Female	159	69.7
Education	Primary/Illiterate	33	14.5
	Secondary	113	49.6
	Tertiary	82	36
Employment status	Unemployed	138	60.5
	Employed/self-employed	90	39.5
Marital status	Single	199	87.3
	Ever married	29	12.7
Contraceptive usage	Yes	187	82
	No	41	18
Number of children	0	57	25
	1 - 5	149	65.4
	6 and above	22	9.6

The table above shows that most respondents were female (69.7%). Regarding age, the majority fell between 18 and 34 (64%), and most respondents had obtained secondary education (50.2%). Furthermore, the findings revealed that more than half of the respondents were unemployed (60.6%), and most lived in rural areas (52. 8%). Almost all the participants were single (87%), and (82. 3%) of the respondents used contraceptives.

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Table 2: Knowledge of cervical cancer

Variables	Responses	n (%)
Have you heard of cervical cancer? (n=223)	Yes	211 (94.6)
	No	12 (5.4)
Have you ever heard of HPV? (n=231)	Yes	95 (41.1)
	No	136 (58.9)
If yes, have you heard of the HPV vaccine? (n=232)	Yes	70 (30.2)
	No	162 (69.8)
What are the risk factors for cervical cancer? * (n=336)	Multiple sexual partners	97 (28.9)
	Early sexual activities	39 (11.6)
	Family history of cervical cancer	37 (11)
	Infection with HPV	33 (9.8)
	Oral contraceptives	18 (5.4)
	Smoking cigarette	14 (4.2)
	Do not know	90 (26.8)
	Other factors:	
	Bathing with soap	3 (0.9)
	Abortion	1 (0.3)
	Traditional herbs	3 (0.9)
	Being unlucky in life	1 (0.3)
Signs and symptoms of cervical cancer? * (n=359)	Pain during sex	91 (25.3)
	Bleeding between periods	80 (22.3)
	Foul-smelling discharge	58 (16.2)
	Urinary urgency	12 (3.3)
	Weight loss	26 (7.2)
	Do not know	92 (25.6)
Can Cervical cancer be prevented? (n=228)	Yes	182 (79.8)
	No	46 (20.2)
By which method can it be prevented? * (n=288)	Avoiding multiple sexual partners	82 (28.5)
	Avoid oral contraceptives	15 (5.2)
	Quit smoking	14(4.9)
	HPV vaccination	46 (20.6)
	Do not know	131 (57.5)
Which screening methods detect cervical cancer? * (n=268)	Pap smear test	104 (38.8)
	Visual Inspection with Acetic Acid (VIA)	51 (19)
	Visual Inspection with Lugol's Iodine	6 (2.2)
	Do not know	107(39.9)

* Multiple Responses

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Vol. 3, Issue 2, pp. 15-29, June 2025, ISSN: 3043-4467 (Online), 3043-4459 (Print)
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The data indicate that while most respondents (94.6%) were aware of cervical cancer, over half (58.9%) had never heard of HPV, and 26.8% lacked knowledge about risk factors. Although 28.9% recognised having multiple sexual partners as a risk, only 9.8% correctly identified HPV as the causative virus. Additionally, 25.6% reported having no knowledge of cervical cancer symptoms, and only a minority identified key symptoms such as pain during sexual intercourse (25.3%), intermenstrual bleeding (22.3%), and foul-smelling discharge (16.2%). In terms of prevention, 28.5% cited avoiding multiple sexual partners, and 20.6% mentioned HPV vaccination. Notably, 79.8% of respondents were aware that cervical cancer is preventable.

Table 3: Logistic regression model for knowledge about cervical cancer among participants.

Predictor variables	Categories	COR (95% CI)	P-value	AOR (95% CI)	P-value
Age (ref: 18-24)	25-34	1.127 (0.569 - 2.231)	**0.137**		
	35-44	0.522 (0.233 - 1.166)	**0.732**		
	45-59	0.439 (0.134 - 1.44)	**0.113**		
Gender (ref: Male)	Female	0.999 (0.537 - 1.861)	**0.175**		
Education (ref: Primary/Illiterate)	Secondary	2.609 (0.733 - 9.28)	0.999		
	Tertiary	9.07 (2.564 - 32.086)	<0.001	1.203 (0.294 - 4.93)	0.008
			0.139	3.479 (1.015 - 14.688)	0.797
			0.001		0.045
Employment status (ref: Unemployed)	Employed/Self-employed	0.763 (0.421 - 1.382)	0.372		
Residence (ref: Rural/village)	Urban	4.11 (2.213 - 7.632)		2.547 (1.266 - 5.125)	0.009
Marital status (ref: Single)	Ever married	0.897 (0.378 - 2.129)	0.805		
Contraceptive usage (ref: No)	Yes	1.111 (0.52 - 2.373)	0.786		
Number of children (ref: 0)	1 - 5	0.333 (0.176 - 0.631)	<0.001		0.001
			0.001	0.354 (0.167 - 0.75)	<0.001
	6 and above	0.049 (0.006 - 0.392)	0.004	0.112 (0.012 - 1.067)	<0.001
HIV testing (ref: No)	HIV testing	1.204 (0.123 - 11.785)	0.873		
Religious group (ref: Muslim/Others)	Christian	0.932 (0.504 - 1.724)	0.822		

AOR: Adjusted odds ratio; COR: Crude odds ratio; 95% CI: 95% confidence interval

International Journal of Sub-Saharan African Research (IJSSAR)
Vol. 3, Issue 2, pp. 15-29, June 2025, ISSN: 3043-4467 (Online), 3043-4459 (Print)
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Table 3 presents the respondents' significant predictors of higher knowledge regarding cervical cancer prevention. Individuals with tertiary education were significantly more likely to possess high knowledge than those with primary or no education (AOR = 3.479, 95% CI: 1.015–14.688, $P = 0.045$). Similarly, urban dwellers demonstrated higher knowledge levels than rural counterparts (AOR = 2.547, 95% CI: 1.266–5.125, $P = 0.009$). Parity emerged as a notable factor, with participants having 1–5 children being 65% less likely to exhibit high knowledge (AOR = 0.354, 95% CI: 0.167–0.750, $P < 0.001$) and those with six or more children being nearly 89% less likely (AOR = 0.112, 95% CI: 0.012–1.067, $P < 0.001$), compared to those without children. In contrast, marital status, employment status, and HIV testing history were not significantly associated with knowledge levels.

Table 4: Attitude on cervical cancer prevention among participants.

Variables	Total (N)	Strongly disagree n(%)	Disagree n(%)	Neutral n(%)	Agree n(%)	Strongly agree n(%)
All women have an equal chance of developing cervical cancer	228	10 (4.4)	38 (16.7)	12 (5.3)	***111 (48.7)***	57 (25)
Cervical cancer can be detected early by screening	221	2 (0.9)	10 (4.5)	8 (3.6)	***139 (62.9)***	62 (28.1)
Cervical cancer screening causes no harm to women	225	22 (9.8)	65 (28.9)	16 (7.1)	***82 (36.4)***	40 (17.8)
It is imperative to consult a doctor if there is bleeding between periods	220	5 (2.3)	2 (0.9)	6 (2.7)	***127 (57.7)***	80 (36.4)
HPV vaccination can prevent cervical cancer	207	13 (6.3)	9 (4.3)	48 (23.2)	***97 (46.9)***	40 (19.3)
All women who develop cervical cancer must have their wombs removed	222	***58 (26.1)***	56 (25.2)	35 (15.8)	41 (18.5)	32 (14.4)
Cervical cancer would threaten a relationship with a sexual partner	224	34 (15.2)	45 (20.1)	29 (12.9)	***65 (29)***	51 (22.8)
I prefer a female health worker to conduct a cervical examination	225	28 (12.4)	25 (11.1)	26 (11.6)	***84 (37.3)***	62 (27.6)

The table above highlights respondents' attitudes toward cervical cancer prevention, showing generally positive views. Most recognised the importance of early screening (91%) and consulting a doctor for intermenstrual bleeding (94.1%). Additionally, 66.2% acknowledged HPV vaccination as a preventive measure. However, misconceptions persisted, with over half believing cervical cancer requires a hysterectomy (51.3%) and that it negatively impacts romantic relationships (51.8%). Most respondents (64.9%) preferred female healthcare providers

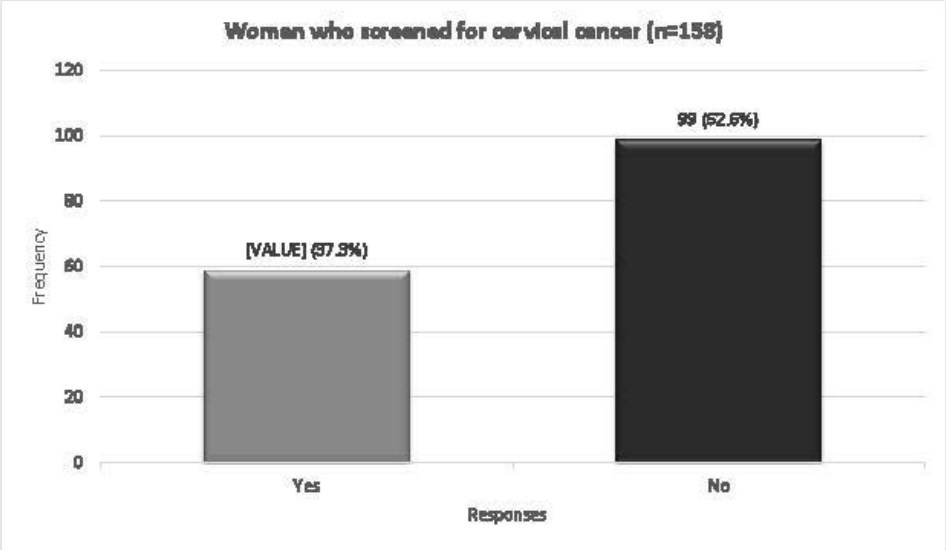
International Journal of Sub-Saharan African Research (IJSSAR)
Vol. 3, Issue 2, pp. 15-29, June 2025, ISSN: 3043-4467 (Online), 3043-4459 (Print)
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for screening, while opinions on the procedure's safety were divided, with 54.2% perceiving it as harmless.

Practice of cervical cancer screening

Only 37.3% of women who responded to this question had been screened, and 40% of men had supported a female figure in their lives to screen for cervical cancer, as shown in Figures 1 and 2 below.

Figure 1: Screened women



International Journal of Sub-Saharan African Research (IJSSAR)
Vol. 3, Issue 2, pp. 15-29, June 2025, ISSN: 3043-4467 (Online), 3043-4459 (Print)
DOI: 10.5281/zenodo.15777503

Figure 2: Men who supported women to be screened.

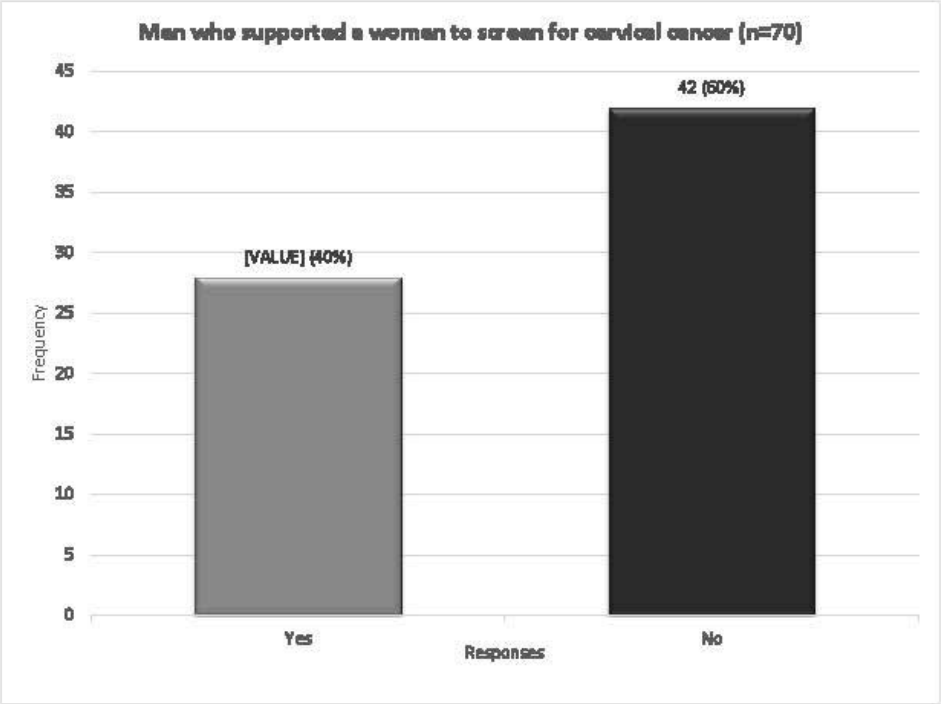


Table 5: Overall score of knowledge, attitude, and practices towards cervical cancer prevention

Variable	Category	Count	Percentage %
Knowledge of cervical cancer prevention (n=228)	Poor knowledge	6	2.6%
	Moderate Knowledge	143	62.7%
	Good Knowledge	79	34.6%
Attitude toward cervical cancer prevention (n=109)	Negative attitude	10	9.2%
	Positive attitude	99	90.8%
Practice towards cervical cancer prevention (n=231)	Poor practice	184	79.7%
	Moderate practice	47	20.3%

International Journal of Sub-Saharan African Research (IJSSAR)
Vol. 3, Issue 2, pp. 15-29, June 2025, ISSN: 3043-4467 (Online), 3043-4459 (Print)
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Table 5 shows that most respondents had moderate knowledge (62.7%) about cervical cancer prevention, while 34.6% had good knowledge and only 2.6% had poor knowledge. Attitudes were largely positive among respondents (90.8%), but practices were poor, with 79.7% of respondents showing poor prevention practices and only 20.3% demonstrating moderate practice.

DISCUSSION

Knowledge, attitudes, and practices of any community about a disease, including cervical cancer, offer essential opportunities for comprehensive prevention and control strategies of the disease. Thus, this study assessed participants' knowledge, attitudes, and practices regarding cervical cancer prevention.

The data showed that most respondents had a moderate level of knowledge, 62.72% regarding the risk factors, signs and symptoms, and methods of preventing cervical cancer in the Ohangwena and Kavango West regions. This level of awareness suggests a potentially improved capacity among women to recognise symptoms early and seek timely medical intervention, while also enabling men to provide informed support. This study's heightened knowledge of cervical cancer mirrors observations from similar studies conducted in Zambia (Nyambe et al., 2019b). The consistency in various settings reflects a growing awareness of cervical cancer, probably driven by community health education efforts, increased advocacy, and access to information through social media. However, this finding is lower than that of a similar study done in southern Morocco among female Anti-Retroviral Therapy (ART) attendants (Arechkik et al., 2023). This could be due to the participants' exposure to health information through healthcare workers during their routine checkups and follow-ups for ART services. The moderate knowledge observed in the context of this study is attributed to the limited integration of cervical cancer education into primary healthcare services outside of HIV care settings.

Moreover, despite a relatively high level of knowledge of cervical cancer among the respondents, the findings of this study highlight critical gaps in knowledge regarding HPV, a virus commonly responsible for about 99% of all cervical cancer cases. This suggests that while awareness campaigns may be successfully conveying general information about cervical cancer, they may not be adequately addressing its primary cause. These findings are consistent with those reported by Ghosh et al. (2024), who found similarly limited understanding of HPV and its vaccine among women. Likewise, Petersen et al. (2022) observed that in Sub-Saharan Africa, general awareness of cervical cancer often coexists with poor knowledge of HPV. In addition, a previous study in Sub-Saharan Africa also indicates that awareness of HPV is low despite general knowledge of cervical cancer being relatively high (Petersen et al.,2022). Fascinatingly, many respondents believed that cervical cancer could be prevented, yet only a small proportion recognised HPV vaccination as a preventive measure. The result could be attributed to the absence of HPV vaccination services in the Namibian public health facilities. This finding is nearly consistent with a study in which women were reported to be aware of cervical cancer but lacked knowledge of prevention strategies such as HPV vaccination (Oleribe et al., 2019). This study contributes to existing literature by underscoring the need for more integrated and specific

International Journal of Sub-Saharan African Research (IJSSAR)
Vol. 3, Issue 2, pp. 15-29, June 2025, ISSN: 3043-4467 (Online), 3043-4459 (Print)
DOI: 10.5281/zenodo.15777503

education on HPV and its vaccine, especially in contexts where it is not routinely offered through public health systems.

In addition, education at the tertiary level emerged as a critical predictor of higher knowledge. Thus, targeted health educational interventions tailored to people with lower educational achievements are essential when addressing knowledge disparities. Additionally, the number of times a woman gave birth to viable offspring highly influenced knowledge levels, as participants who had 1-5 children were found to be less knowledgeable than those without children. Those with more than five children were even less likely to demonstrate higher knowledge. This inverse association may reflect the tight priorities and resource challenges faced by more prominent families, which can limit their engagement with health information and health service accessibility (Zibako et al., 2022). Future interventions should consider the unique constraints of high parity individuals, with the potential integration of cervical cancer education into maternal and child health programmes.

The data revealed that, although a substantial proportion of respondents demonstrated a positive attitude, a minority exhibited a negative attitude. For instance, most participants agreed that cervical cancer could be detected early by screening (91%) and that all women had an equal chance of developing cervical cancer (73.7%). Previous studies have shown that attitudinal factors, such as feeling susceptible to cervical cancer, affect the uptake of screening services (Kussia et al., 2024; Rasul et al., 2022). The generally favourable attitudes observed in this study and relatively high knowledge levels present a valuable opportunity to scale up cervical screening programmes in northern Namibia. It is plausible that increasing access to screening services, especially in remote and underserved areas, could translate this positive outlook into action. However, contrasting evidence from other studies shows that even when screening opportunities are made available, women may still refrain due to non-informational barriers such as stigma, fear of a cancer diagnosis, distance to health facilities, and discomfort with screening procedures (Mengesha et al., 2023; Petersen et al., 2022). Thus, cervical cancer awareness and prevention programmes should continually seek to influence women's and men's attitudes about cervical cancer and screening. In addition, interventions should be designed to accommodate culturally sensitive health education campaigns that exclusively engage traditional leaders and address local beliefs.

It is evident from the data that, whilst respondents exhibited good knowledge and a positive attitude, this was not entirely reflected in their practice. The screening practices for cervical cancer were reported to be poor among the respondents in this study. This suggests that this might be the result of inadequate health campaigns for cervical cancer, highlighting challenges in translating awareness of cervical cancer prevention into practice. A survey conducted among females residing in Al Ain city of the United Arab Emirates (UAE) presented similar results, in which (31.3%) of women were classified with inadequate practice towards cervical cancer screening (Elbarazi et al., 2023). The findings highlight the need to strengthen health education and move accessibility initiatives closer to the people to help improve participation in efforts toward cervical cancer prevention.

International Journal of Sub-Saharan African Research (IJSSAR)
Vol. 3, Issue 2, pp. 15-29, June 2025, ISSN: 3043-4467 (Online), 3043-4459 (Print)
DOI: 10.5281/zenodo.15777503

CONCLUSION

Based on the findings, this study concludes that while the knowledge of cervical cancer is relatively high, significant gaps remain in knowledge regarding HPV and HPV vaccinations. Positive attitudes towards cervical cancer screening are uplifting. However, structural and cultural barriers impede preventive practices. When designing community-based prevention interventions, cultural and familial factors must be considered to engage both women and their families to improve acceptance and overall participation in cervical cancer prevention programmes. The study's overall results provide a base for healthcare workers and policymakers to tailor-make interventions that advance awareness, challenge misbeliefs, and increase participation in prevention measures.

Ethical clearance

Ethical clearance was sought and obtained from the Ministry of Health and Social Services in Namibia, and the participants used in the study. They were made to understand that the exercise was purely for academic purposes, and their participation was voluntary.

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Sources of funding

The study was not funded.

Conflict of interest

The authors declare that they have no conflicts of interest.

Authors contributions

Elizabeth Ndakukamo conceived the study, including the design, and wrote the original manuscript, while Dr. Mahalie and Dr. Panduleni Hailonga-Van Dijk guided data collection and analysis. All the authors read and approved the final manuscript for publication in its current form.

Availability of data and materials

The datasets on which conclusions were made for this study are available on reasonable request.

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Ndakukamo, E. K., Mahalie, R., & Hailonga, P. (2025). Cervical cancer prevention in rural Namibia: A cross-sectional analysis of community knowledge, attitudes, and practices in Ohangwena and Kavango West. *International Journal of Sub-Saharan African Research, 3*(2), 15-29

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Vol. 3, Issue 2, pp. 15-29, June 2025, ISSN: 3043-4467 (Online), 3043-4459 (Print)
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Appendix 12: Journal Article 2 (Published): Objective 3

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Health system constraints in cervical cancer prevention in rural Namibia: A qualitative study

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Background: Cervical cancer remains a pressing public health concern in Namibia, with significant barriers to prevention, particularly in rural areas.

Aim: This study explored health system's challenges and their impact on cervical cancer prevention efforts.

Setting: This study was conducted in the Ohangwena and Kavango West regions of Namibia.

Methods: A qualitative exploratory design was employed, focusing on healthcare workers directly involved in cervical cancer prevention. In-depth interviews were utilised to collect data from 11 participants from four district hospitals. Thematic analysis, guided by the World Health Organisation's six health system framework pillars, was used.

Results: Key service gaps were identified across critical areas of cervical cancer prevention, including a lack of awareness, a lack of human papillomavirus vaccines and referral screening equipment that limited local outreach services. Other significant findings included the shortage of trained personnel and the manual data systems, which resulted in deficiencies in decision-making. Financial constraints, including reliance on non-governmental organisation funding and weak community engagement, exacerbated by cultural stigma, presented leadership challenges.

Conclusion: Investing in human resources for health, decentralising budget trends and enhancing data systems are critical for cervical cancer prevention in rural Namibia. Equally important is the active involvement of the community in these efforts.

Contribution: This study highlights key health system constraints in the Ohangwena and Kavango West regions.

Keywords: cervical; cancer; prevention; health system; challenges; health infrastructure; Namibia.

Introduction

Cervical cancer continues to be a significant public health concern, with a pronounced variation in its incidence and mortality rates globally.[1] In the developed world, awareness of cervical cancer is significantly higher compared to the developing world.[2] In sub-Saharan Africa (SSA), approximately a third of the general population knows about cervical cancer.[3] In 2022, there were 662 301 newly diagnosed cases of cervical cancer and 348 874 fatalities worldwide, with over 94% of these deaths occurring in developing countries.[4] Cervical cancer is the leading cause of cancer-related deaths among women in Africa, having a mortality rate of 23.1%.[5] SSA experiences a significant impact, with 40 new cases diagnosed per 100 000 women each year.[4] Though recent national statistics on cervical cancer incidence are limited in Namibia, the Global Cancer Observatory (GLOBOCAN) estimates that cervical cancer ranks as the second most prevalent after breast cancer in Namibia, with approximately 350 new cases and 203 deaths reported in 2022.[4] The leading cause of cervical cancer is a long-lasting infection with the human papillomavirus (HPV).[6]

Over the years, healthcare systems in Africa have suffered from numerous challenges that have cut across institutional, financial, human resources, technical and political development.[7] In light of this, the World Health Organization (WHO) developed a framework in 2007 that breaks down healthcare systems into six fundamental pillars, or 'building blocks', that is service delivery (provision of healthcare services), healthcare workforce (availability and distribution of healthcare

workers), healthcare information systems (management of health information), medicinal products, vaccines and technology (access to essential medicines and technologies), financing (funding of healthcare services) and leadership and governance (management and oversight of healthcare systems).[8] The bulk of African countries lack the fundamental infrastructure needed for effective healthcare systems.[7,9,10]

Namibia faces challenges in the healthcare delivery sector that have influenced the high prevalence and incidence of cervical cancer. These challenges include a lack of awareness, a lack of HPV vaccines in the public health sector, which is the primary prevention method for cervical cancer; and a limited healthcare service delivery infrastructure.[3] Other prevalent healthcare challenges include a significant shortage of specialised healthcare professionals, mainly because of limited local training opportunities.[9] As part of efforts to remedy the shortage of specialised healthcare professionals, aspiring medical specialists have frequently been sent to South African universities for advanced training, resulting in high costs and extended vacancies in essential healthcare roles.[9] Furthermore, indirect financial obstacles worsen the situation because many women in rural areas cannot cover the costs related to transportation to healthcare facilities for screening and treatment, as over 40% of Namibians do not live within a five-kilometre radius, as recommended by WHO.[10] Additionally, the lack of solid policy backing and erratic acquisition of medical products and technologies cause disruptions in service delivery.[9] At the same time, inadequate health data management hinders effective follow-up and continuity of care.[11]

Several studies have documented that cervical cancer prevention (CECAP) programmes are present in the healthcare systems of most developing nations.[12,13,14,15] Nevertheless, health systems with screening and treatment programmes encounter challenges, resulting in cervical cancer screening coverage that is significantly lower than the WHO-recommended 70% of the targeted population during the first 10 years of implementation.[16] Maseko et al. argue that inadequate staff training in screening, treatment, referral and record keeping is some of the health system challenges that have contributed to the failure of health systems in implementing effective CECAP programmes.[15] In addition, they found that there was poor management of cervical cancer at the district level, coupled with inadequate service providers and a lack of essential equipment.[15] These findings were similar to those of Ebu et al.,[17] who found that the lack of healthcare workers and the availability of screening and treatment centres located mainly in urban areas were the most challenging. These challenges collectively undermine the effectiveness of CECAP programmes across developing countries.[2]

There is a paucity of studies on CECAP, screening and treatment in Namibia. Though multiple studies have addressed prostate cancer[18,19,20] and breast cancer,[21,22] only two studies examined the issues related to cervical cancer screening at regional health facilities.[23,24] No studies across the country have investigated the challenges encountered by the Namibian healthcare system in detecting cervical cancer incidence. So far, insufficient focus has been given to tackling the specific challenges encountered by the healthcare system in rural areas, especially at the community-based level. Arguably, all the foregoing may impede effective CECAP and control in Namibia's Ohangwena and Kavango West regions.

Research methods and design

Study design and setting

The study employed an exploratory qualitative design to explore the health system challenges in CECAP. The study was conducted in the Ohangwena and Kavango West regions, two predominantly rural regions located in northern Namibia. Ohangwena is a densely populated region bordering Angola, with a population of 261 691 people. Approximately, 94% of this population resides in rural areas.[25] The Kavango West region also borders Angola, with a population of 123 266; like Ohangwena, a significant number of inhabitants reside in rural areas.[25] Both regions have well-documented challenges in healthcare services and service delivery, and they were selected because of their high prevalence of cervical cancer, inadequate prevention and screening services, and known disparities in health infrastructure, which may contribute to poor prevention efforts. The specific study locations included three health districts in the Ohangwena region (Okongo, Eenhana and Engela) and the only health district in the Kavango West region (Nankudu).

Study population and sampling strategy

The target population was healthcare workers (nurses, doctors and community health extension workers) involved in CECAP. This study employed a purposive sampling method to identify healthcare workers with firsthand experience of CECAP across the Ohangwena and Kavango West regions. Eleven participants were recruited from all the district hospitals in both regions. In addition, participants were approached through formal invitations sent through the office of their regional health directors. Healthcare workers from the two regions with at least a year of working experience in CECAP services were included in the study. This ensured insights from experienced individuals directly involved in cervical cancer management. Staff with less than one year in their role, those not directly involved in CECAP and those from outside the targeted health districts were excluded from the study.

Data collection

An in-depth interview guide was used to conduct face-to-face interviews in English from June to August 2024. The guide's themes were guided by the pillars of the WHO health system frameworks.[8] The instrument was divided into seven sections. Section one gathered socio-demographic details about participants, while the remaining sections examined the health system challenges based on the six pillars as foundational elements of a health system: health services delivery, workforce, health information, leadership

and governance, essential medical products, vaccines and technologies, and financing. Participants were given time to review the information sheet, and the researcher additionally clarified the aim of the study, detailing the anticipated length of the interview and the use of the audio recorder. Written informed consent was obtained before the interviews were conducted. The interviews took place in a private room within the hospital to ensure confidentiality at times that were convenient for the participants. Each interview lasted between 26 and 48 min and was recorded using a mobile phone. Data saturation occurred after interviewing nine participants. However, the researchers interviewed two more participants to declare data saturation.

Data analysis

The socio-demographic data were analysed descriptively in Microsoft Excel and presented in a frequency table. The interviews were transcribed verbatim 24 h after each interview. An inductive thematic analysis approach was conducted, guided by the Braun and Clarke Framework.[26] The transcripts were coded to identify critical insights related to health system constraints in CECAP using ATLAS. Ti 23 software. A codebook was created in Microsoft Word to integrate and collate the codes, after which overlapping themes and subthemes were identified. To ensure trustworthiness and rigour, the guide was piloted with two healthcare workers from the Kavango West region who were not part of the main study to assess the relevance and clarity of the questions. Additionally, literature control was performed to compare the results with those of existing literature. Two independent coders reviewed and analysed the transcripts to ensure reliability.

Ethical considerations

Ethical clearance to conduct this study was obtained from the Research Ethics Committee of the Faculty of Health, Natural Resources and Applied Sciences at the Namibia University of Science and Technology (NUST) (No. FHNRAS:58/2023) and the Ministry of Health and Social Services Ethics Committee (No. 22/3/1/2). Permission to conduct the study in the selected settings was granted by the health regional directors for each region. Following the complete presentation of the study's objectives and the expectations surrounding their participation, all participants gave their written consent. Participation was entirely voluntary, and transcripts were anonymised at reporting to protect the participants' privacy. The data were stored and password protected on the personal computer of the corresponding author without access to any third parties to ensure confidentiality.

Results

Socio-demographic characteristics of participants

Eleven participants agreed to participate in the study; seven were females, and four were males. The demographic characteristics of the participants are outlined in Table 1.

Emerging themes

The findings are structured into six main themes: service delivery, health workforce, health information, health financing, essential medical products and technology and leadership and governance. The outline of themes, sub-themes and key findings is presented in Table 2.

Theme 1: Service delivery

High-quality service delivery ensures that personal and non-personal health interventions are safe, effective and accessible to those in need at the right time and place.[8] This theme highlights the inadequate access and inconsistency of screening, vaccination and community outreach services.

Sub-theme 1.1: Cervical cancer screening services

Cervical cancer screening services, including Visual Inspection with Acetic acid (VIA) and Pap smear tests, are available in all the district hospitals and some clinics. However, these services often face interruptions because of transport challenges and shortages of staff. A participant noted:

> 'There are times we have to cancel trips to clinics because there is no car, even if the booking was made way earlier.' (P1, female, 28 years old)

> 'I am the only CECAP nurse here, and if I go on leave, then there is no one to screen, so patients should wait for me to come back.' (P4, female, 48 years old)

This shortage hinders continuous access to cervical cancer screening services. While coverage was generally positive, consistency was affected by some challenges. Resource constraints occasionally slowed service provisions at the clinic, as noted by one participant:

> 'It's supposed to be in all clinics, but sometimes, due to staff and equipment shortage, you find some of the clinics stopped somewhere.' (P6, female, 32 years old)

TABLE 1: Socio-demographic characteristics of participants ($N = 11$).

Variables	Categories	#	%
Age (years)	18–29	1	9.0
	30–35	4	36.4
	> 35	6	54.6
Gender	Female	7	63.6
	Male	4	36.4
Education level	Diploma	2	18.2
	Bachelor's degree	7	63.6
	Master's degree	2	18.2
Occupation	Doctors	4	36.4
	Nurses	6	54.5
	Health extension worker	1	9.0
Working experience (years)	1–5	4	36.3
	6–10	3	27.3
	> 10	4	36.4
Region	Kavango West	6	54.6
	Ohangwena	5	45.4
Employer	Government	6	54.5
	NGO	5	45.5

NGO, non-governmental organisation.

TABLE 2: Outline of themes, sub-themes and key findings.

Theme	Sub-theme	Key findings
1. Service delivery	1.1. Cervical cancer screening services	Clinics offer VIA and Pap smear screenings, but service interruptions occur because of shortages and logistical constraints, particularly in rural areas.
	1.2. HPV vaccine accessibility	HPV vaccines are primarily available in the private sector, with limited access to public health facilities.
	1.3. Community outreach services	Outreach efforts are mainly clinic based, with occasional campaigns coordinated with community leaders. Resource and transportation challenges affect coverage.
2. Health workforce	2.1. Staff shortages and retention	High turnover rates among healthcare workers, especially young professionals. Rural postings and lack of incentives contribute to retention challenges. Heavy reliance on NGO-funded positions raises sustainability concerns.
	2.2. Training and specialisation	Few healthcare workers receive specialised training in cervical cancer screening. There is a shortage of gynaecologists and oncologists.
3. Health information	3.1. Data collection and management	Data collection is mostly manual, with limited use of electronic systems. Some districts have basic digital systems, but connectivity and equipment limitations pose challenges.
4. Health financing	4.1. Budget constraints	No dedicated government budget for cervical cancer prevention. Services rely heavily on NGO funding, raising concerns about long-term sustainability.
5. Access to essential medicines	5.1. Supplies for screening services	Frequent shortages of VIA and Pap smear kits disrupt service delivery. HPV vaccines are largely unavailable in public facilities.
	5.2. Equipment and infrastructure	Screening equipment is outdated, and storage facilities are inadequate. Basic infrastructure, such as examination beds, needs improvement to meet patient needs.
6. Leadership and governance	6.1. Prevention policy	Leadership oversight is present, but strategic support is insufficient. Governance relies heavily on NGO funding because of the lack of a dedicated cervical cancer policy.
	6.2. Community involvement	Collaboration with community leaders is inconsistent. There is a lack of local advocates for cervical cancer awareness, and cultural stigma remains a barrier to screening.

VIA, visual inspection with acetic acid; HPV, human papillomavirus; NGO, non-governmental organization.

Sub-theme 1.2: HPV vaccine accessibility

About 80% of the participants identified the availability of HPV vaccines as a critical issue, as these vaccines are primarily accessible through private-sector services only. The Namibian public health facilities have not introduced the HPV vaccine to date, and the participants were not even aware of any rollout, leaving lower-income populations underserved. One respondent stated:

> 'Unfortunately, we cannot offer HPV to everyone who needs it, especially the patients who use public health services. It does not exist, but if you have medical aid, I am not sure, but I think you can get it in private.' (P3, male, 51 years old)

Sub-theme 1.3: Community outreach services

Participants discussed varying views on outreach services, with some acknowledging the community sensitisation efforts through health talks on the community radio channel and the involvement of traditional leaders and Community Health workers. However, these efforts were often obstructed by logistical challenges. For instance, one participant indicated that:

> 'Community campaigns are coordinated with traditional leaders, but screening primarily occurs in clinic settings, not really in the community, due to bad roads and long distances. Every clinic is given a specific date for when we are coming.' (P1, female, 28 years old)

Theme 2: Health workforce

A responsive, fair and efficient health workforce works to achieve the best possible health outcomes, optimising available resources and adapting to prevailing circumstances.[8] The health workforce theme reflects emerging constraints related to staffing shortages, struggles with staff retention and insufficient specialised training in CECAP.

Sub-theme 2.1: Staff shortages and retention

Approximately 90% of the participants cited that the availability of trained healthcare staff was a prominent challenge, with many clinics served by only one or two CECAP-trained nurses and doctors, which limits service continuity and outreach capacity. Staff turnover was an ongoing issue, particularly in remote areas, where retention was almost impossible. One participant shared:

> 'They come here to get into the system, then they want to leave. Housing and bush allowances are provided, but many nurses still transfer out to cities.' (P3, male, 51 years old)

> 'It's hard to keep young professionals in these rural postings; they leave for better opportunities elsewhere.' (P9, male, 40 years old)

Some participants also discussed the reliance on non-government organization (NGO)-funded positions, which further raises concerns about the sustainability of staffing:

> 'All of us are conducting this service under NGO support. One day, when the NGO pulls out, there will be a huge challenge.' (P7, female, 39 years old)

Sub-theme 2.2: Training and specialisation

Most participants stressed the lack of specialised staff in CECAP and treatment, including trained gynaecologists and oncologists. Ohangwena region had one gynaecologist and Kavango west region had none. Most healthcare workers have minimal training in cervical cancer screening techniques, affecting the quality and reach of services. A respondent remarked:

> 'We don't have enough staff with specialised training, which limits the services we can provide.' (P5, male, 37 years old)

> 'If the patient comes in with an advanced stage of cervical cancer, we refer them to the Intermediate Hospital Oshakati (IHO). There is no capacity here.' (P8, female, 36 years old)

Theme 3: Health information

A strong health information system allows the production, analysis, dissemination and use of accurate and timely data on health determinants, health system performance and population health status.[8] This theme focuses on the challenges in data collection and confidentiality that impact data-driven decisions in CECAP.

Sub-theme 3.1: Data collection and management

Participants from both regions reported that data collection largely relies on manual processes, with only a few districts employing basic digital systems. However, Internet connectivity issues and basic equipment shortages, such as computers, hamper digital data collection and management efforts. Some staff members noted:

> 'Our data collection is still mostly manual, and without proper connectivity, digital options are hard to implement.' (P1, female, 28 years old)

> 'We don't have enough computers because you would want them at each point of the care. The CDC should have, but most departments do not have.' (P2, female, 35 years old)

One participant appreciated the quarterly data reviews that allowed clinics to assess and adjust service delivery:

> 'Data is essential for planning and improving services. If I was here last quarter and I'm here now, it means I need to do more on this.' (P11, male, 34 years old)

However, staff shortages occasionally disrupted data review meetings, reducing opportunities for thorough record analysis and feedback:

> 'The data review meeting used to be conducted, but due to a lack of staff, we don't attend all the meetings anymore.' (P7, female, 39 years old)

Theme 4: Health financing

A sound health financing system secures adequate funding to ensure that individuals can access necessary health services without risking financial hardship or poverty because of medical expenses.[8] More than 90% of the participants discussed financial limitations as a recurrent barrier to the provision of care, affecting nearly all facets of CECAP services in both regions.

Sub-theme 4.1: Budget constraints

The Namibian government has implemented Universal Health Care, and all health services in public facilities are free of charge. However, there is no dedicated funding for cervical cancer alone. Thus, the CECAP programme relies heavily on NGO financial support and primarily focuses on HIV-positive patients. While this dependence elevated sustainability concerns, participants appreciated the resources NGOs provided, which allowed facilities to maintain continuous services. One participant expressed appreciation for this partnership:

> 'NGOs are collaborating with the government, giving us the necessary stock and supporting us.' (P6, female, 32 years old)

Another participant noted the benefit of this funding, particularly for reaching remote communities:

> 'With the support of NGO, we have been able to keep services running and reach out to more women, especially those that live in the inland.' (P7, female, 39 years old)

However, participants expressed concerns about the absence of a district-specific budget, which made consistent outreach difficult and often drove health workers to resort to informal funding mechanisms such as the use of personal funds and other sales to meet agent needs. One participant emphasised this point:

> 'We do not have a budget at the district level, only at the region, and the competition is high. Basically, first come, first serve. So, when there is no money, and we want to buy, for instance, curtains, staff members contribute money. Sometimes, we sell the empty containers from the pharmacy to generate more [*money*].' (P9, male, 40 years old)

Theme 5: Access to essential medicines

A functional health system ensures fair access to high-quality, safe, effective and cost-efficient medical products, vaccines and technologies supported by scientifically sound practices.[8] This theme encompasses the shortages in supplies, equipment and infrastructure necessary for effective CECAP.

Sub-theme 5.1: Supplies for screening services

Essential screening supplies were generally available in many clinics, allowing for continued VIA and Pap smear services. However, for early-stage screenings and treatment for positive cases, participants reported adequate resources, although there were no HPV screening services. One participant noted:

> 'When a patient presents with precancerous cells, for stage one and two treatments, we manage [*it*] here at the district hospital, there are two trained doctors.' (P7, female, 39 years old)

However, all participants from one district hospital reported facing recurring shortages of supplies for cervical cancer screening, requiring rescheduling of patients. A participant noted the need for consistent supply management, saying:

> 'Pap smear testing kits usually run out of stock, then we rebook the patients, especially those who are above 60 years, and give them a date to come back, but sometimes most of them do not come back and only come back when they are sick.' (P11, male, 34 years old)

A shortage of educational materials was also highlighted, which hindered awareness efforts, as one participant mentioned:

> 'The ministry does not provide pamphlets anymore. Giving health information from the mouth without giving pamphlets is ineffective.' (P7, female, 39 years old)

Sub-theme 5.2: Equipment and infrastructure

Health facilities require improved infrastructure, including updated equipment and sufficient storage, which facilitates

the delivery of quality care. Basic amenities such as examination beds often need to be improved, impacting patient comfort and care quality. A participant remarked:

> 'We don't even have examination beds like this one I am using belongs to casualty, and they can come to get it anytime. Sometimes even this lamp you see here is not working; it's challenging to provide quality care with such limited resources.' (P4, female, 48 years old)

Theme 6: Leadership and Governance

Challenges in governance and leadership reflect a lack of cohesive policies and insufficient community engagement in cervical cancer awareness and prevention.[8]

Sub-theme 6.1: Prevention policy

While leadership oversight was evident, strategic support was limited; participants felt that logistical and policy support for CECAP required strengthening. One staff member commented:

> 'The absence of a dedicated policy makes it hard to establish structured, long-term programmes for cervical cancer.' (P5, male, 37 years old)

> 'We don't have a specific policy for cervical cancer here; it's all managed under general health.' (P3, male, 51 years old)

Sub-theme 6.2: Community involvement

Although there is some collaboration with community leaders, it remains occasional, with limited advocacy for cervical cancer awareness, as most initiatives are focused on other diseases such as HIV/AIDS, TB and malaria. Furthermore, cultural stigma discourages many women from participating in screenings, as reproductive health discussions are deemed taboo in the setting. A participant explained:

> 'Cultural beliefs and misinformation that your womb will be removed, and many others, discourage many people from seeking screening; we need more local champions to advocate for awareness.' (P2, female, 35 years old)

Despite these limitations, the involvement of community leaders in health campaigns from one district was appreciated, as it helped build trust and engage the community. Another participant highlighted:

> 'Community leaders are involved, and we hold meetings with them here and there to discuss health issues, including cervical cancer.' (P4, female, 48 years old)

Discussion

This study found that while CECAP services are available and actively implemented in both regions, issues related to staffing, funding and essential resources present significant barriers to achieving comprehensive service delivery. CECAP services delivery in these regions is structured into primary and secondary levels yet lacks consistency in coverage and effectiveness. Primary prevention efforts, such as awareness education and vaccination against HPV, are hindered by availability, with vaccines predominantly offered only in private facilities at a cost that is not affordable to many. As noted in studies by Al-Amro et al.[27] Human papillomavirus vaccination coverage is significantly lower in rural areas, particularly in developing settings where public access to vaccines is restricted. Furthermore, secondary prevention through cervical cancer screening using VIA and Pap smear tests was commonly offered in the district hospitals and some clinics, and community health education efforts were utilised to raise awareness. However, coverage was limited by frequent staff shortages and a need for transportation for outreach. This coverage issue, particularly in low-resource settings, is consistently highlighted in similar studies as a primary obstacle to healthcare access.[27,28,29] This study finds that such constraints in staffing prohibit the establishment of reliable, effective and continuous screening programmes, which may reduce early detection rates and subsequently negatively affect treatment outcomes. Furthermore, cervical cancer screening programmes are mainly facility based, and this limits outreach to remote areas. This finding is similar to other studies, where geographic isolation remains an essential issue for hard-to-reach populations.[30,31,32,33] The minimal outreach in hard-to-reach areas reflects a missed opportunity to mobilise and educate communities, potentially reducing uptake because of logistical challenges and lack of awareness.

The study highlighted a lack of adequately trained health professionals, particularly in specialised areas such as gynaecology and oncology. Studies by Legasu et al. and Habila et al.[34,35] emphasise similar workforce constraints in SSA, noting that health personnel often lack specialised training in women's health, and the availability of trained staff is often inadequate in rural settings. Moreover, patients with advanced diagnoses of cervical cancer are referred to tertiary facilities kilometres away from where they live, and the booking process and turnaround are often lengthy. This dependency on external health facilities could contribute to delays in diagnosis and treatment. Addressing these challenges may require a dual strategy of improving working conditions in rural areas and enhancing training programmes to produce a workforce equipped for rural and specialised care.

Staff retention issues, particularly among young nurses who relocate to urban areas seeking better living and working conditions, further complicated service continuity. For instance, it was identified that only one or two CECAP-trained nurses were available per district, often requiring rotational service to multiple clinics. These findings align with those of Mugassa and Frumence,[30] who reported that rural-to-urban migration among healthcare workers disrupts rural healthcare service delivery. On the contrary, positive findings emerged, such as the support from health extension workers and community leaders who played active roles in outreach and health education activities.

Moreover, the study revealed that data management was largely manual, limiting the potential for effective data

collection, storage and analysis. Although some electronic tools were in place in some facilities, equipment shortages and Internet connectivity issues were reported to hamper their effectiveness. The study further found that even though manual data collection was consistent, users often perceived the process as ineffective because of its inability to be integrated into strategic planning. The limited use of collected data for actionable decisions in these regions could indicate a more significant trend seen in other studies, where data collection in low-resource settings tends to be administrative rather than strategic.[36,37] The study extends this knowledge by showing that there is a need for targeted training in data analytics and a shift in data culture, where data are viewed not merely as a reporting tool but as a resource for improving patient care.

Additionally, funding was noted to be a critical barrier, highlighting that NGOs primarily funded CECAP services. This is consistent with previous findings highlighting that cervical cancer services in SSA are often donor dependent, with NGO funding accounting for a substantial share of resources.[10,38] While this support has been invaluable, the limited dedicated government budget for cervical cancer services raises sustainability distress, especially if NGO support were to diminish. Furthermore, it was noted that the current health financing model in Namibia is solely based on a regional budget rather than district-specific allocations, resulting in deferrals and competition for the already inadequate funds. The merged funding approach often limits the agility of district hospitals in addressing immediate needs. Ampofo et al. also observed this challenge in decentralised health systems.[31] Moreover, the study identified financial constraints that compel staff to spend personal money to meet urgent needs. This pattern highlights an informal mode of financing in resource-scarce health systems. The use of petty cash generated from non-essential sales at health facilities, such as empty pharmacy containers, reflects resourcefulness yet also highlights systemic underfunding. Introducing dedicated district budgets could enhance financial autonomy, as seen in models from other low- and middle-income countries, where decentralised funding enables quicker responses to localised needs.[39]

Additionally, this study found that although some screening equipment is generally available at district hospitals, clinics and outreach points, it often lacks portable screening equipment, such as foldable beds and privacy tents. The need for portable screening equipment is emphasised in similar studies, where limited resources for mobile units directly affect the accessibility of cancer screenings in rural areas.[40,41] The availability of these resources is essential to expand access to preventive services in geographically isolated areas.

Finally, leadership and governance challenges, especially the double roles of healthcare managers, affect the coordination and delivery of healthcare services, including CECAP. Health managers struggle to balance administrative duties with direct patient care responsibilities and may face time constraints that hinder their involvement in operational oversight. This challenge echoes the findings by Obol et al.,[42] who argue that effective leadership requires adequate time for both administrative and clinical responsibilities.

Limitations

The results are contextual and cannot necessarily be extrapolated to other areas, particularly urbanised regions of either Namibia or other nations. Additionally, this is a qualitative study based on the perceptions of participants, which may lead to response bias. However, triangulating the new findings with some quantitative data would allow for a comprehensive description of the challenges of CECAP.

Conclusion

The cross-cutting challenges to CECAP observed in this study highlight systemic barriers that will need many solutions. Improving access to CECAP services is vital to tackle service delivery issues, workforce shortages and retention issues, health information challenges, financial constraints and pervasive governance gaps. This study adds to the literature by identifying region-specific barriers and potential evidence-based solutions in policy, such as district-specific budgets, improved workforce training and increased access to mobile service screening. These recommendations, if implemented, will enhance the CECAP framework within Namibia and could be a model for other low-resource settings.

Recommendations to policy and practice:

- The Ministry of Health and Social Services (MoHSS) needs to allocate district-specific budgets to support regionally tailored CECAP efforts.
- MoHSS is encouraged to improve training and retention of healthcare workers who are involved in cervical cancer screening and health education services.
- The MoHSS needs to support and expand access to mobile screening services to reach remote and underserved populations.
- Strengthening health information systems is critical to improve tracking, monitoring and reporting of cervical cancer services.
- The MoHSS needs to incorporate community engagement strategies to address cultural norms and improve cervical cancer screening uptake.

Recommendations for future research:

- Evaluate the cost-effectiveness of mobile cervical cancer screening in rural areas.
- Explore culturally sensitive interventions aimed at enhancing community awareness towards cervical cancer screening.
- Investigate the role of digital health technologies in improving health information management and follow-up care in cervical cancer screening programmes.

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Competing interests

The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

Authors' contributions

E.K.N. was responsible for the entire study process through conceptualisation, methodology design, the conduct of the research, data analysis and validation. R.M. and P.H.-v.D. were the overall study supervisors and contributed to the article's idea, method design, validation and critical review. All authors, E.K.N., R.M. and P.H.-v.D., discussed the results and contributed to the manuscript.

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Data availability

The data that support the findings of this study are available from the corresponding author, E.K.N., upon reasonable request.

Disclaimer

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Appendix 13: Manuscript Under Review: Objective two

Health-Seeking Behaviour of Rural Women for Cervical Cancer Prevention in Namibia: A Qualitative Study

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Abstract

Background: In Namibia, cervical cancer preventative services exist; however, these services are not easily accessible to women living in rural areas, which leads to late presentation for cervical screening and treatable morbidity as well as mortality. Understanding the sociocultural and systemic impediments to health-seeking behaviour is imperative for designing responsive interventions.

Aim: To explore the perceptions, experiences, as well as health-seeking behaviour of rural women in Namibia regarding cervical cancer prevention.

Setting: Six rural constituencies in the Ohangwena and Kavango West regions of Namibia were covered in the study.

Methods: An exploratory, descriptive qualitative design was employed. Moreover, data were collected through five focus group discussions with 40 women aged 20-65 years, selected purposively. Discussions were audio-recorded, transcribed, translated into English, and analysed thematically through ATLAS-ti 23.

Results: Six themes emerged: 1) low awareness and misinformation about cervical cancer; 2) structural impediments, including extended distances; 3) transport costs as well as overcrowding of health facilities; 4) negative healthcare experiences, including poor communication; 5) lack of confidentiality; and 6) cultural norms limiting open dialogue and autonomy. Motivators for screening included health workers' encouragement from health workers as well as perceived personal risk.

Conclusion: Sociocultural and systemic impediments significantly influence rural women's engagement in cervical cancer prevention activities; hence, interventions must address these impediments through community education, stronger health systems, and inclusive decision-making.

Contribution: This study provides context-specific insights into the health-seeking behaviour of rural women in Namibia, informing policy and practice for more equitable cervical cancer prevention.

Keywords: Cervical cancer, health-seeking behaviour, rural women, Namibia, screening barriers, qualitative study.

Introduction

Cervical cancer is one of the most preventable types of cancer, yet it continues to exert a disproportionate challenge on women in low- and middle-income countries (LMICs). Globally, more than 90% of cervical cancer deaths occur in LMICs, despite the availability of effective preventive measures such as the human papillomavirus (HPV) vaccination as well as regular screening. [1] In Sub-Saharan Africa, cervical cancer screening prevalence is low at 10.29%.[2] Unlike numerous other cancers, cervical cancer presents a unique opportunity for elimination, as affirmed by the World Health Organisation (WHO), which launched a global strategy to eliminate cervical cancer as a public health concern.[3] It is imperative to note that numerous countries in sub-Saharan Africa, including Namibia, have yet to realise the full benefits of these interventions due to complex socio-economic, cultural, and systemic impediments. [4,5]

Furthermore, Namibia is among the countries classified to have a high percentage of cervical cancer by the World Health Organisation, with an age-standardised incidence rate (ASIR) exceeding 30 cases per 100,000 women annually, which is significantly higher than the global average of 13.3 cases per 100,000 women per year.[6] The five-year survival rate ranges from 45-55%, below the global average of 66%, reflecting late presentation as well as limited access to timely diagnosis and treatment. [6] Despite the endorsements of the Namibian National Cervical Cancer Screening Policy Guidelines in 2018 by the Namibia Ministry of Health and Social Services (MoHSS), which include the use of Visual Inspection with Acetic Acid (VIA) and Pap smear screening, service uptake remains low, especially in rural areas. [2] More importantly, these challenges are compounded by health system constraints such as staff shortages, supply chain inconsistencies, and weak referral pathways. [7] At the individual and community level, additional impediments such as limited education, fear, stigma, low risk perception, as well as prevailing gender norms further hinder women's participation in preventive care. [8,9]

While awareness about cervical cancer is relatively high among women in Namibia, being aware does not equate with health-seeking behaviour. [10] It is imperative to note that less than half of women who are aware of screening undergo screening, suggesting that knowledge solely cannot prompt preventive action. [7] Impediments to cervical cancer screening are sophisticated and interconnected. Firstly, a sociocultural expectation is that obligations to household and childcare take precedence over health. Consequently, even if women have an awareness or know what actions they should take, they may postpone screening to fulfil their obligations to their families. Secondly, many households are male headed, which may require spousal

permission and/or financial resources before women can access services. Moreover, preventative services such as cervical cancer screening are compounded by cultural norms of modesty as well as unwillingness to expose intimate body parts to male health workers, as well as the belief that you only seek care when you have symptoms. In addition, there is a reliance on traditional healers for initial care. Thirdly, the health system also presents impediments to women in the following manner: long travel distances to the clinics, inconsistent services being offered regarding screening, the shortage of trained personnel to provide service, as well as occasionally the lack of supplies necessary to perform the screening. These barriers create a multifaceted environment that does not promote timely health-seeking behaviour. Equally important, awareness about cervical cancer does not equate with timely health-seeking behaviour, hence this finding points to the need for context specific approaches.

A growing body of literature from sub-Saharan Africa reveals that women's decisions to seek cervical cancer prevention services are embedded in broader socio-ecological systems; at the macro level, national health policies, funding priorities, and cultural norms; at the meso level, community beliefs, health delivery systems, and social networks; at the micro level, household decision-making dynamics and spousal support; and the individual level, personal beliefs, knowledge, and perceived vulnerability. [11] Studies from Tanzania,[12] Kenya,[13] and Malawi[14] indicate that fear of stigma, perceived invulnerability, lack of partner support, as well as mistrust in health systems contribute to delayed or forfeited screening, even when services are physically accessible. However, much of the research in Namibia has concentrated on quantitative epidemiological data as well as service coverage indicators, neglecting a critical gap in understanding women's lived experiences, particularly in rural settings. [15–17] Moreover, a population-based study in sub-Saharan Africa underscores urban-rural disparities in screening uptake in Namibia, with 23.8% of urban women screened compared to only 14.2% of rural women, however the study failed to explain the contextual drivers of these gaps.[18] As a result, health programmes may lack the cultural relevance and local legitimacy needed to improve engagement with services. Therefore, this study seeks to explore the health care-seeking behaviour of rural women in Namibia regarding cervical cancer prevention. In particular, it aims to document their perceptions of cervical cancer as well as its risks, describe impediments and facilitators to preventive care, moreover explain how individual, familial, and community-level factors intersect to influence their decisions. Through this exploration, the research intends to contribute to an evidence - based study that may inform culturally appropriate interventions as well as advance Namibia's progress toward the World Health Organisation goal of cervical cancer elimination.

Theoretical framework

This study is underpinned by the ecological model of health behaviour, which emphasises that seeking health care is not determined solely by individual knowledge or attitudes, however by the dynamic interplay of multiple levels of influence. [11] At the individual level, women's perceptions of cervical cancer risk, awareness of preventive measures, as well as personal attitudes shape their intentions to seek care. More importantly, interpersonal factors, such as spousal and family support, community expectations, and peer influence, can either facilitate or constrain engagement with screening as well as vaccination services. At the organisational and community level, accessibility of health facilities, availability of trained providers, as well as trust in health systems fulfill a critical role. Finally, structural and policy environments, including national health priorities, resource distribution, the gap of policy implementation, as well as cultural norms, create broader conditions that shape individual choices.

Research method and design

Study design and setting

This study employed an exploratory, descriptive qualitative design to explore rural women's perceptions, experiences, and behaviours related to seeking cervical cancer preventive care. This design was adopted to provide an in-depth understanding of subjective meanings and contextual factors shaping women's health-seeking behaviour. Moreover, the study was conducted in the Ohangwena and Kavango West regions of Namibia. Regional cancer registry reports (2006–2009) indicated that the Ohangwena and Kavango West regions had a particularly high proportion of female cancers (up to 35.9% of reported reproductive cancers in that period), while more recent local studies in Ohangwena and Kavango West report low screening uptake as well as multiple impediments to prevention.[19] The primary ethnic groups are the Ovambo and Kavango, each with distinct cultural practices, in particular regarding health and gender roles.

Study population and sampling method

The study included women aged 20-65 years, consistent with the target age group outlined in the Namibian National Cervical Cancer Screening Policy Guidelines, attending health facilities for routine care, residing in Ohangwena and Kavango West, moreover who provided informed consent. It excluded women under 20 years old and older than 65, non-residents, women who had a complete hysterectomy or were unable or unwilling to participate. The Ohangwena (12 constituencies) and Kavango West regions (8 constituencies) were purposively selected. In

addition, within those regions, constituencies and health facilities were selected as recruitment sites. Community health workers were employed to recruit participants purposively based on their experiences of seeking care. More importantly, forty women participated in the study. The study facilitated five focus group discussions consisting of eight participants. All participants received both verbal and written information regarding the study and provided written informed consent to participate in the study. Furthermore, they were informed that they could withdraw from the study at any time without any consequence.

Data Collection

Data were collected over two weeks in August 2024. Moreover, a semi-structured interview guide developed in English and translated into Oshikwanyama and Rukwangali was administered. A trained team comprising the principal researcher and four female research assistants (two per region) conducted the study. A research assistant moderated the discussions, employing a semi-structured interview guide, while the principal researcher drafted notes as well as managed the audio recordings. To ensure validity and depth, the second research assistant paraphrased and posed follow-up questions to clarify or expand on participants' responses. It is imperative to note that both research assistants were local community health workers and were fluent in the local languages. Moreover, they were trained in qualitative data collection techniques. The interview guide was pilot tested with women in a constituency in each region that was not part of the main study. This process enabled the testing of the cultural appropriateness and relevance of the questions; moreover, minor revisions were conducted, such as exchanging particular reproductive health terms for phrases that were locally understood and culturally acceptable. This was conducted to reduce discomfort and encourage open responses. For example, the question "Have you ever been screened for cervical cancer?" was amended to "Have you ever checked at the clinic for any problem in your cervix or womb?" to align it with local expressions. Each FGD lasted approximately 90 minutes and was conducted at a private venue.

Data analysis

The audio recordings were transcribed verbatim and translated into English. Moreover, transcripts were cross verified by two independent language editors, one fluent in Oshikwanyama and the other in Rukwangali, against the original recordings to ensure accuracy and fidelity to the participants' narratives. Data were managed and analysed via ATLAS.ti version 23 (https://atlasti.com/). More importantly, an inductive thematic analysis approach was applied. Initial codes were developed from the transcripts and subsequently grouped into themes and subthemes that reflected the participants' perspectives. The principal investigator conducted

coding; moreover, the research team met regularly to discuss discrepancies until consensus was reached. There were no discrepancies detected.

Ethical Considerations

Ethical clearance was obtained from the Research Ethics Committee of the Faculty of Health, Natural Resources and Applied Sciences at the Namibia University of Science and Technology (Ref: NUST/REC/2025/10) and from the Ministry of Health and Social Services (reference number: 22/3/1/2). In addition, written informed consent was obtained from all participants prior to data collection. Confidentiality and anonymity were maintained throughout the study by assigning pseudonyms to participants and securely storing all audio files and transcripts on a password-encrypted device.

Results

Socio-demographic characteristics of participants

The study included 40 rural women, most of whom (40%) were between 30 and 39 years of age. Nearly half (47.5%) had attained secondary education, while 42.5% held only primary or no formal education. The demographic characteristics of the participants are illustrated in Table 1.

TABLE 1: Socio-demographic characteristics of participants (*N*= 40).

Variables	**Categories**	***n***	**%**
Age (years)	20-29	5	12.5
	30-39	16	40
	40-49	11	27.5
	50-59	7	17.5
	60-65	1	2.5
Education	Primary/Illiterate	17	42.5
	Secondary	19	47.5
	Tertiary	4	10
Employment status	Unemployed	24	60
	Employed/self-employed	16	40
Marital status	Single	31	77.5
	Married	9	22.5

Number of children	None	4	10
	1 - 5	26	65
	6 and above	10	25
Screened	Yes	18	45
Not screened	No	22	55

Emerging themes and sub-themes

The study analysis revealed six themes and associated sub-themes, as outlined in Table 2. These themes reflect the multidimensional nature of health-seeking behaviours among rural women as well as the sociocultural and systemic factors influencing their decisions. The direct quotes are presented as per the focus group discussion (FDG), per region (Ohangwena (OH) and Kavango West (KW) and participant number (P).

TABLE 2: Outline of themes, sub-themes.

Theme	Sub-theme
1. Knowledge and awareness of cervical cancer	1.1. Limited understanding of cervical cancer and its symptoms
	1.2. Misconceptions and misinformation
	1.3. Basic awareness of prevention
2. Barriers to cervical cancer screening	2.1. Structural and logistical barriers
	2.2. Service delivery and health system issues
	2.3. Age and eligibility confusion
3. Health care experiences and alternatives	3.1. Mixed perceptions of health workers
	3.2. Use of traditional or spiritual healing alternatives
4. Autonomy and cultural influence	4.1. Women's independence in decision-making
	4.2. Cultural fears and stigma
5. Motivators for screening uptake	5.1. Health worker encouragement
	5.2. Self-motivation and perceived risk
6. Community and institutional support needs	6.1. Need for local health education and outreach
	6.2. Emotional support from family and community
	6.3. Health promotion and material needs

Theme 1: Knowledge and Awareness of Cervical Cancer

Sub-theme 1.1: Limited understanding of cervical cancer and its symptoms

Even though 45% of the participants were screened for cervical cancer, about 70% of the participants demonstrated a limited or inaccurate understanding of cervical cancer symptoms. Moreover, while some vaguely associated the disease with genital wounds, others had never received any health education on the topic. A participant stated the following:

"No, not really. Nevertheless, we suspect that wounds or sores in the private area might be a sign. However, we are not certain and would like more information" (FGD1, OH, P8).

A participant expressed the following:

"I do not know much about cervical cancer, but I know it is dangerous." (FGD4, KW, P29).

The uncertainty revealed in participants' responses underscores a knowledge gap and the need for basic health education on cervical cancer.

"I have heard about it, but I am not sure what causes it." (FGD2, OH, P12).

"It sounds like something that happens to older women only, not people like us, young ones." (FGD 3, OH, P19).

Sub-theme 1.2: Misconceptions and misinformation

Several participants reported misinformation circulating in their communities. Moreover, cultural myths and rumours contributed to fear and avoidance of screening services. Several participants shared beliefs not grounded in scientific understanding, for example, the belief that screening procedures involve removing the womb, which discouraged participation, while others attributed transmission to uncircumcised men.

"There are rumours about the womb being removed during the screening procedure; that is why people do not want to go to the hospital for screening." (FGD5, KW, P33).

A participant stated:

"Some people say you can become barren after doing that test. It is terrifying, especially if you are not done having kids." (FGD3, OH, P21).

Conversely, some participants reported misinformation that cervical cancer screening is rooted in fear and cultural myths, perpetuating stigma and deterring women from seeking assistance. A participant added the following:

"Some people in our village say that the tools used to screen women are not clean, and sometimes they cut you during the procedure, and it is very painful" (FGD1, OH, P6).

Sub-theme 1.3: Basic awareness of prevention

A few participants demonstrated awareness of preventive methods, such as condom use; however, the understanding of how this relates to cervical cancer was vague. A participant indicated:

"Yes, as long as you are using a condom, I do not think you will get cervical cancer." (FGD3, OH, P17).

"I think it is caused by unprotected sex, so staying faithful to one partner can help prevent you from contracting the disease." (FGD2, OH, P16).

However, knowledge of HPV and vaccination was lacking, as reflected by some participants;

"I have never heard of HPV before. If there is a vaccine, why aren't we receiving it here at the clinic? They tell us about screening for cancer in women, but not that one" (FGD2, OH, P16).

"I just found out about HPV during this discussion. If the vaccine can protect us, everyone should be able to receive it, not only school-aged girls." (FGD5, KW, P33).

"We do not know much about HPV. If the health workers are not going to tell us about it, how do we ask for a vaccine?" (FGD4, KW, P31).

Theme 2: Barriers to Cervical Cancer Screening

Sub-theme 2.1: Structural and logistical barriers

Regarding impediments to screening, some participants indicated that they were not screened because they could not afford transport costs to health facilities, in particular those who lived in the inland, making access to health services challenging. Furthermore, inaccessibility of clinics due to distance or poor roads was noted as a limitation, limiting participants' ability to attend screenings regularly. Participants indicated the following:

"Some of us have to walk long distances from our homes because there are no taxis in our area, so sometimes you sit at home and wait until the sickness is gone" (FGD3, OH, P24).

"It is far, and there is no regular transport in my village. If the mobile clinic does not come, we cannot go and most of the time the mobile clinics take months to visit." (FGD4, KW, P26).

Sub-theme 2.2: Service delivery and health system issues

Overcrowding and long wait times during cervical cancer screening campaigns rendered some participants unattended as well as discouraged future attempts. A participant stated:

"I tried attending a screening campaign when I visited one of my uncles in town, but the crowd was too big, we waited all day and went home without being seen." (FGD2, OH, P11).

Conversely, participants also reported inconsistent service delivery, such as unavailable staff or poorly organised outreach visits for VIA, which further contributed to their dissatisfaction. A participant corroborated this:

"Sometimes they tell us the machine is not working, and one time I went there because the doctor referred me because my periods were not stopping. I was told to come back another day. They took my number and never called" (FGD5, KW, P35).

Sub-theme 2.3: Age and eligibility confusion

Several participants were misinformed about the eligibility criteria based on age, leading to early disengagement.

"*Sometimes, it is because of age restrictions. I was once told I was too young, so I never returned."* (FGD1, OH, P2).

Theme 3: Health Care Experiences and Alternatives

Sub-theme 3.1: Mixed perceptions of health workers

While some participants expressed trust in health providers, respondents described their encounters with healthcare workers as discouraging and emotionally distressing. Moreover, they indicated that health service providers were often unapproachable, disrespectful, or did not maintain patient confidentiality. A participant expressed the following:

"Some nurses have unfriendly attitudes, shout, and do not maintain confidentiality. You know my sister: sometimes they treat you based on appearance and status, they think you are pretending to be sick." (FGD4, KW, P40).

This perception created a sense of fear and reluctance to return for future services. A participant recalled:

"When I asked questions, the nurse ignored me and moved on to the next person. I felt embarrassed and discouraged." (FGD2, OH, P16).

These negative experiences were not universal, however, significantly influenced women's willingness to seek preventive care.

Sub-theme 3.2: Use of traditional or spiritual healing alternatives

In the absence of trust in or access to formal health services, several participants reported turning to alternative sources of healing, such as churches and traditional healers. More importantly, these practices were often rooted in cultural beliefs and community norms, offering emotional comfort and perceived healing. As one participant stated:

"Some people visit revival churches and spiritual houses, others visit traditional healers for preventing diseases from getting worse." (FGD5, KW, P36).

This choice was influenced by dissatisfaction with conventional services, fear of being judged, or a stronger belief in spiritual interventions. Moreover, such alternatives, while more accessible and familiar, may delay biomedical screening and treatment, accentuating the need for culturally sensitive health education. A participant explained:

"At church, the pastor prays for us and gives us holy water. It feels safer." (FGD3, OH, P23).

Theme 4: Autonomy and Cultural Influence

Sub-theme 4.1: Women's independence in decision-making

Numerous participants expressed a strong sense of autonomy in making decisions related to their health in general, including whether to undergo cervical cancer screening. In addition, this sense of independence appeared to be shaped by a growing confidence among participants to take control of their well-being. A participant explained:

"The decision to seek health care is entirely ours because only we can make it ourselves." (FGD1, OH, P4).

While some respondents felt empowered, others acknowledged that male partners still held influence over health decisions, either explicitly or implicitly. In contexts where male support was lacking, autonomy could be challenging to exercise. A participant noted:

"I make my own decisions about my health, but it is not easy. People talk, and they say a woman who goes for such tests without her husband's permission is disrespectful. Sometimes I keep quiet to avoid conflict." (FGD4, KW, P30).

Sub-theme 4.2: Cultural fears and stigma

More importantly, cultural norms remained a significant constraint to open conversations as well as preventive actions. Furthermore, numerous participants feared the consequences of challenging patriarchal expectations, especially in discussing sensitive issues like condom use or male circumcision. A participant admitted:

"If someone hears you are being tested for cervical cancer, they may think you have been promiscuous. That kind of judgment stops many women from going, even when they want to." (FGD2, OH, P10).

Another patient reflected:

"Some people say that if you go for screening, it means you are already sick or have been unfaithful. That makes women afraid because they do not want to be talked about in the community, also, there is silence around sexuality, and it is even worse when you have to say you have a problem 'down there'." (FGD4, KW, P28).

In addition, the association of cervical cancer with promiscuity or unfaithfulness created further stigma. Some women worried that seeking screening might lead to accusations or mistrust from their partners. A participant expressed:

"If you mention screening, he asks, 'Why? What have you been doing?' So, you keep quiet." (FGD1, OH, P3).

Theme 5: Motivators for Screening Uptake

Sub-theme 5.1: Health worker encouragement

Healthcare professionals were key in influencing women's decisions to be screened. Moreover, participants consistently cited recommendations from nurses during routine visits—such as antenatal care, postnatal consultations, or immunisation appointments as crucial motivators. A respondent noted:

"The nurses recommended I go for screening." (FGD5, KW, P35).

This encouragement from trusted health personnel enabled demystify the procedure as well as reduce anxiety about the outcome. It also reinforced that screening was a routine and a crucial aspect of women's health. A participant recalled:

"It was during a clinic visit when the nurse said we should all get checked. That pushed me to go." (FGD2, OH, P14).

Sub-theme 5.2: Self-motivation and perceived risk

Beyond external encouragement, some women were motivated by personal concern as well as a desire to stay healthy. Furthermore, numerous participants indicated that they took the initiative to be screened after learning about the dangers of cervical cancer or suspecting that they might be at risk due to their own or their partner's behaviour. A participant stated:

"Some of us take the initiative because we want to know our cervical health status." (FGD2, KW, P9).

This proactive attitude reflected a growing shift in health consciousness as well as personal responsibility. A participant expressed:

"Nowadays, it is hard to trust a partner fully, so we decided to get screened just to be safe." (FGD4. KW, P16).

Theme 6: Community and Institutional Support Needs

Sub-theme 6.1: Need for local health education and outreach

Participants repeatedly called for broader awareness initiatives to improve community knowledge and dispel myths about cervical cancer. More importantly, they proposed practical outreach strategies such as radio announcements, school talks, as well as women's group meetings. A participant explained:

"They should give announcements via local radio to alert people." (FGD3, OH, P20).
Another added:

"They must come to the villages, not just town clinics. Many people here do not know about this disease." (FGD5, KW, P38).

Sub-theme 6.2: Emotional support from family and community

Family encouragement, in particular from female relatives, was identified as a significant enabler of screening uptake. Moreover, some women noted that their sisters, mothers, or close friends motivated them to seek screening and offered reassurance during the process. A participant indicated:

"Their encouragement helps us through the process." (FGD1, OH, P2).

Such social support eased fears and reduced stigma. In addition, sometimes, participants went in groups or accompanied one another to health facilities. A participant remarked:

"When someone you trust goes with you, it makes the whole thing less scary." (FGD2, OH, P16).

Sub-theme 6.3: Health promotion and material needs

In addition to education and emotional support, participants expressed the need for practical resources to promote cervical health. These included hygiene items, free screening supplies, vaccinations, as well as modern preventive technologies. As one participant emphasised:

"Modern preventive treatments, such as injections, would help because we have nothing right now." (FGD3, OH, P20).

Lack of access to basic health materials was perceived as an impediment to prevention as well as maintaining general reproductive health. Another added:

"Even soap or pads would make a difference. We are often told to be clean, but do not have what we need." (FGD5, KW, P33).

Discussion

This study explored the health-seeking behaviours of rural Namibian women regarding cervical cancer prevention. The key findings revealed several interrelated themes: (1) widespread gaps in knowledge as well as awareness of cervical cancer and its prevention; (2) structural, systemic, and sociocultural barriers that hinder screening uptake; (3) mixed perceptions of healthcare experiences and the turn toward traditional or spiritual alternatives; (4) women's relative autonomy in health decision-making tempered by cultural stigma and gendered dynamics; and (5) both intrinsic and extrinsic motivators for screening, alongside expressed needs for improved community education, emotional support, as well as material resources.

More importantly, this study underscores the persistence of low awareness and misinformation as significant impediments to cervical cancer prevention among rural women, reflecting a tendency widely documented in sub-Saharan Africa. [20,21] While several participants demonstrated basic awareness associating cervical cancer with sexual behaviour or hygiene, this knowledge was often vague or distorted by myths, such as the belief that screening involved the removal of the womb. These misconceptions indicate a more profound absence of culturally relevant health education as well as the dominance of informal information channels, echoing studies from Ethiopia and Uganda, where health messaging failed to bridge the gap between biomedical knowledge and local beliefs. [22,23]

The findings further revealed substantial structural and logistical constraints that inhibit screening access. Furthermore, transport costs, long distances to clinics, and poorly coordinated outreach engagements reflect evidence from Zimbabwe and Ethiopia, where financial and geographic challenges reduce service uptake. [24] Moreover, confusion about eligibility, especially among younger women, illustrates a lack of consistent public health communication. More importantly, this ambiguity may lead to missed opportunities for early detection, particularly in regions where cervical cancer often presents late due to delayed care-seeking.

Engagements with healthcare workers emerged as a defining influence on women's screening behaviour. At the same time, positive interactions could motivate action, and negative encounters indicated by perceived disrespect, breaches of confidentiality, or dismissiveness discouraged return visits. These accounts resonate with findings from Kenya, where provider attitudes were a determinant of perceived service acceptability. [8,13] When health systems

reproduce hierarchical or judgmental dynamics, especially in reproductive health contexts, they reinforce stigma and silence, particularly in patriarchal rural settings.

Moreover, in settings where formal health services were perceived as inaccessible or untrustworthy, women turned to traditional or spiritual avenues for comfort and meaning. This reliance does not merely reflect a rejection of clinical care, however, a search for support systems that align with local values as well as offering agency within a culturally relevant context. As observed in Tanzania, such dual engagement with traditional and clinical options underscores the need for health systems to acknowledge as well as respectfully integrate local beliefs. [20]

Despite systemic challenges, the study reported examples of agency and resilience. Furthermore, several participants described independently deciding to undergo screening, even when this defied partner expectations or cultural norms. These expressions of autonomy suggest that participants are not passive recipients of health information, however active navigators of constrained choices, a finding consistent with a feminist health study in another patriarchal society. [25] Risk perception, emotional survival, as well as self-preservation motivate health-seeking in ways that formal interventions often overlook.

Moreover, healthcare provider encouragement during routine visits fulfilled a role in screening uptake. Antenatal and immunisation appointments provided practical engagements for cervical cancer information, aligning with findings from Zambia and Nigeria that provider recommendation is one of the strongest predictors of uptake. [26,27] Notably, self-motivation also featured prominently, several participants pursued screening not just due to awareness, however out of concern for their health in the context of infidelity or relationship uncertainty. This suggests a shift from passive awareness to proactive engagement grounded in personal risk assessment.

Lastly, participants underscored the need for specific institutional and community-level support, recommending radio-based campaigns, the involvement of family and community leaders, as well as the urgent provision of hygiene materials and modern preventive options such as HPV vaccination. These findings indicate a broader understanding among participants that cervical cancer prevention is inseparable from the wider conditions of reproductive health. More importantly, the interlinkage of education, access, emotional support, and material needs reflects a holistic perception of health that is increasingly supported in global health literature. [8,28] Equally important, these findings indicate that while knowledge and awareness are imperative, they must be embedded within an enabling environment where health systems are accessible, respectful, and culturally relevant. Without addressing the structural, interpersonal, and cultural dimensions of health-seeking, cervical cancer prevention engagements will

continue to be inadequate, in particular in rural contexts where trust in the system is fragile and choices are often constrained.

Strengths and Limitations

A significant strength of this study is embedded in its use of a qualitative, community-based approach that allowed for an in-depth exploration of women's lived experiences in underserved regions. Moreover, conducting focus group discussions in local languages further enhanced authenticity and participant comfort. It is imperative to note that the study is limited by its geographic scope, as findings may not be generalisable beyond Ohangwena and Kavango West regions. Additionally, social desirability bias may have influenced responses, particularly on sensitive matters related to reproductive health and gender dynamics.

Implications and Recommendations

These findings hold significant implications for policy and practice. Firstly, cervical cancer education should be decentralised and embedded into routine community health platforms. Local radio services, churches, and women's groups should be strengthened to correct misinformation, reduce stigma, and normalise screening. Secondly, health worker training needs to prioritise respectful care as well as communication, particularly in rural health facilities where trust is already fragile. Thirdly, logistical impediments such as transport, equipment availability, as well as mobile outreach need to be addressed through targeted investment in rural health infrastructure. More importantly, engaging male partners and traditional leaders at the community level may assist reduce cultural stigma, moreover support women's autonomy in health decisions. Finally, policy attention needs to extend beyond awareness to include access to essential materials such as hygiene products, self-sampling kits, and HPV vaccines, as integral to reproductive health equity. Moreover, future research should evaluate the long-term impact of health education campaigns in addition explore how digital instruments can support screening uptake in remote areas. Ultimately, cervical cancer prevention must be framed not only as a medical priority however as a reproductive justice matter, one that demands sustained attention to the social, structural, as well as cultural dimensions of rural women's health.

Conclusion

This study demonstrated that rural Namibian women encountered complex impediments to cervical cancer prevention, including poor awareness, cultural constraints, as well as structural challenges. These findings underscore the need for culturally grounded, gender-sensitive, as well as community-oriented approaches to improve screening uptake. Addressing these barriers could significantly reduce cervical cancer morbidity as well as mortality among these rural populations.

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Competing interests

The authors declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

Author contributions

E.K.N. conceptualised the study, designed the research tools, conducted the data collection and analysis, and led the drafting of the manuscript. R.M. and P.H. contributed to the methodology design, supported the data analysis process, and reviewed the manuscript. All authors read and approved the final manuscript.

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Data availability

The data supporting this study's findings are available from the corresponding author, E.K.N., upon reasonable request.

Disclaimer

The views and opinions expressed in this article are those of the authors and are the product of professional research. It does not necessarily reflect the official policy or position of any affiliated institution, funder, agency or that of the publisher.

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Appendix 13: Language editing certificate

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LANGUAGE EDITING – ELIZABETH KALEINASHO NDAKUKAMO

This letter serves to confirm that a thesis for the requirement of the degree of Doctor of Philosophy in Health Sciences at the Namibia University of Science and Technology titled: DEVELOPMENT OF A COMMUNITY-BASED PREVENTION MODEL FOR CERVICAL CANCER MANAGEMENT IN OHANGWENA AND KAVANGO WEST REGIONS IN NAMIBIA was submitted to me for language editing.

The thesis was professionally edited and suggestions were made in the document. The research content or the author's intentions were not altered during the editing process and the author has the authority to accept or reject my suggestions.

Yours faithfully,

Mukoroli

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