

**EFFECT OF A NURSE-LED HEALTH EDUCATION INTERVENTION ON
CERVICAL CANCER KNOWLEDGE AMONG WOMEN AND MEN IN
SSABAGABO-MAKINDYE SUB-COUNTY, WAKISO DISTRICT, UGANDA**

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**UGANDA CHRISTIAN
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Declaration

I, Namirembe Milly Bulwa, declare that this original work is mine and has not been submitted elsewhere for any degree.

Namirembe Milly Bulwa

A handwritten signature in black ink, appearing to read 'M Bulwa', with a stylized initial 'M'.

30th AUGUST, 2026

Approval

I endorse this supervised dissertation for submission to Uganda Christian University, Directorate of Research and Postgraduate Studies.



Supervisor: Elizabeth Namukombe Ekong, PhD, MNS, RN/RM

Date: 31/08/2026

Dedication

This work is dedicated to my beloved family and friends for their unwavering support and constant inspiration.

Acknowledgement

My sincere appreciation goes to my supervisors, Dr. Elizabeth Namukombe Ekong for direction when I was doing this work. My gratitude also goes Uganda Christian University and the Nursing Faculty for providing me the necessary academic support.

Similarly, I extend my heartfelt appreciation to the study participants and church leaders especially Reverend Elijah Kyobe, in-charge of the parish, who granted me approval to carry out the study. Likewise, I thank my research respondents for their cooperation and participation in the study. Lastly, I am also much obliged to my close relatives with friends for their prayers during this academic journey, their encouragement gave me the moral support to keep on working.

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Abstract

In Uganda, cervical cancer continues to be a primary source of cancer-related illness and death for women. Despite the existence cervical cancer knowledge participation rates remain inadequate, largely due to widespread low awareness. This investigation assessed the effect of a nurse-led health education intervention on the understanding and behaviors of women and men regarding cervical cancer screening in Wakiso District.

The research utilized a quantitative single-group design with pre- and post-test assessments, conducted across intentionally chosen churches in Bunamwaya Parish. A cohort of 245 individuals aged 21 and older, along with their spouses or partners, was recruited through purposive sampling. Information on awareness was gathered using a standardized questionnaire before and after health education intervention. The data were examined using descriptive statistics and independent t-tests.

Findings indicated that the health education initiative led to a statistically significant increase in participants' knowledge levels. There were significant increases were observed in general cervical cancer knowledge (Mean difference = 0.45, $t = 2.543$, $p = .011$), screening Knowledge (Mean difference = 0.40, $t = 2.969$, $p = .003$), and age/frequency of screening knowledge (Mean difference = 0.27, $t = 2.377$, $p = .018$). These results suggest that the intervention was effective in enhancing participants' understanding of cervical cancer, and recommended screening intervals.

The study concludes that health educational efforts led by nurses successfully improve community awareness, practices, and plans for engaging in cervical cancer screening. Incorporating these initiatives into broader public health approaches can reinforce preventive measures, aid earlier identification, and help reduce the impact of cervical cancer across Uganda.

Chapter One: Introduction

Cervical cancer is characterized by abnormal and uncontrolled growth of cells that occurs in the cervix, usually starting in the transformation zone at the squamo columnar junction (Okunade, 2020). The sequence of events from mild dysplastic alterations to invasive carcinoma may be slow, taking a decade or even more (World Health Organization, 2024; National Cancer Institute, 2024). A vast majority of cases are linked to the presence of high-risk human papillomavirus (HPV) types, mainly 16 and 18 (McBride, 2022). Other risk factors are high parity, history of sexually transmitted infections, tobacco use, and immune suppression (Diabelková et al., 2023).

Background

Cervical cancer remains one of the most serious global health problems, and women in their prime earning years are most affected, besides resulting in serious socioeconomic problems for the families and health systems (Singh et al., 2023). Worldwide, about 660,000 new cases were diagnosed and 350,000 deaths recorded in 2022, with low- and middle-income countries that have limited knowledge accounting for over 90% of the deaths (World Health Organization, 2023; Goldstein, Tran & Akselrod, et al. 2024).

In sub-Saharan Africa, this cancer makes up about 25% of all new cancer cases in women (Bray et al., 2021). The highest regional burden is borne by Eastern Africa with an age-standardized incidence of 40.1 per 100,000 women and a mortality rate of 28.6 per 100,000 (World Health Organization, 2023). Cervical cancer in Uganda is a major problem: it accounts for 43% of all female cancers, and every year, about 6,959 new cases and 4,607 deaths happen (ICO/IARC HPV Information Centre, 2023b; Uganda Ministry of Health, 2020).

Wakiso District is one of Uganda's fastest growing districts due to rapid urbanization and population growth. This expansion has increased pressure on health services and created disparities in access to health education, particularly for preventive services such as cervical cancer education (Uganda Bureau of Statistics, 2024). However, even at the community level, both women and men are poorly informed about cervical cancer risk factors, symptoms, and screening services (Isabirye et al., 2020). Knowledge is an important prerequisite because behavior is influenced by many factors. People with sufficient knowledge about cervical cancer are more likely to identify early signs, modify their behavior to prevent the disease, and use available screening services (World Health Organization, 2020; Mukama et al., 2020).

Cervical cancer prevention can be greatly enhanced by involving men - a factor that has been hardly exploited - in settings where men usually make household health decisions (Osuafor et al., 2023). Evidence shows that when men are included in health educational programmes, women's cervical cancer screening rates increase significantly (Roudsari et al., 2023). Community-level nurse-led health education is clearly a scalable and acceptable way to simultaneously close knowledge gaps and engage men in preventive health care (Ndejjo et al., 2016).

Statement of the Problem

Despite cervical cancer being one of the most preventable cancers through HPV vaccination, early detection and timely treatment of precancerous lesions, Uganda continues to experience one of highest cervical cancer burdens worldwide. Every year, there are an estimated 6,959 new cases and over 4,600 deaths, which lead to a mortality-to-incidence ratio of 66%, which reflects late diagnosis and delayed health-seeking. Inadequate knowledge of cervical cancer remains a significant public health concern, with many women and men lacking sufficient understanding of its risk factors, symptoms, preventive measures, and available screening services.

Limited knowledge contributes to delayed recognition of symptoms, misconceptions, poor utilization of preventive services, and ultimately poor health outcomes.

Although community health education has been recommended as an effective strategy for improving cervical cancer awareness, few intervention studies in Uganda have evaluated the effectiveness of structured nurse-led health education that involve both women and men. Therefore, this study sought to evaluate the effect of a nurse-led health education intervention on cervical cancer knowledge among women and men in Ssabagabo-Makindye Sub-County, Wakiso District.

Purpose of the Study

The overall aim of this study was to evaluate the effect of a nurse-led health education intervention on knowledge of cervical cancer among women and men in Ssabagabo-Makindye Sub-County, Wakiso District.

Research Objectives

1. To assess the baseline level of cervical cancer knowledge among women and men before the nurse-led health education intervention in Ssabagabo-Makindye Sub-County, Wakiso District.
2. To determine the level of cervical cancer knowledge among women and men after the nurse led- health education intervention in Ssabagabo-Makindye Sub-County, Wakiso District.
3. To determine the effect of the nurse-led health education intervention on cervical cancer knowledge among women and men in Ssabagabo-Makindye Sub-County, Wakiso District.

Significance of the Study to Nursing

This research is expected to benefit nursing education, policy and future research in the following ways:

- The evidence collected in this study reinforces the effectiveness of nurse-led health education interventions.
- This study adds to the existing nursing literature on the “role of nurse- led health education interventions” in promoting male involvement in cervical cancer education.
- These findings may inform the development of evidence-based community health education programmes to improve knowledge of cervical cancer prevention, early detection, and screening.
- The findings may provide district health management teams with practical guidance on integrating nurse-led community education into scalable health promotion programmes aimed at improving knowledge of cervical cancer prevention, early detection, and screening.

Theoretical Framework

This research was conducted using the Health Promotion Model (HPM), which was published by Nola J. Pender in 1982 and later updated in 1996 (Pender, Murdaugh, & Parsons, 2015). The HPM is an important guide for developing nurse led- health education intervention aimed at important knowledge of cervical cancer which focus not only on barriers to screening but also on other determinants, such as cognitive, affective, and social determinants of health-promoting behaviors.

Prof. Nola J. Pender granted permission to use the HPM (see Appendix A). The model has three main components: individual characteristics and experiences, behavior-specific cognitions and affect, and behavioral outcomes.

Individual Characteristics. These are the personal biological, psychological, and sociocultural factors that uniquely influence health behaviors. In this study, sociodemographic factors such as age, gender, level of education, marital status, and occupation were considered personal characteristics that could affect participants' knowledge of cervical cancer (Pender et al., 2015). Prior knowledge regarding cervical cancer constitutes the previous experience considered in the study.

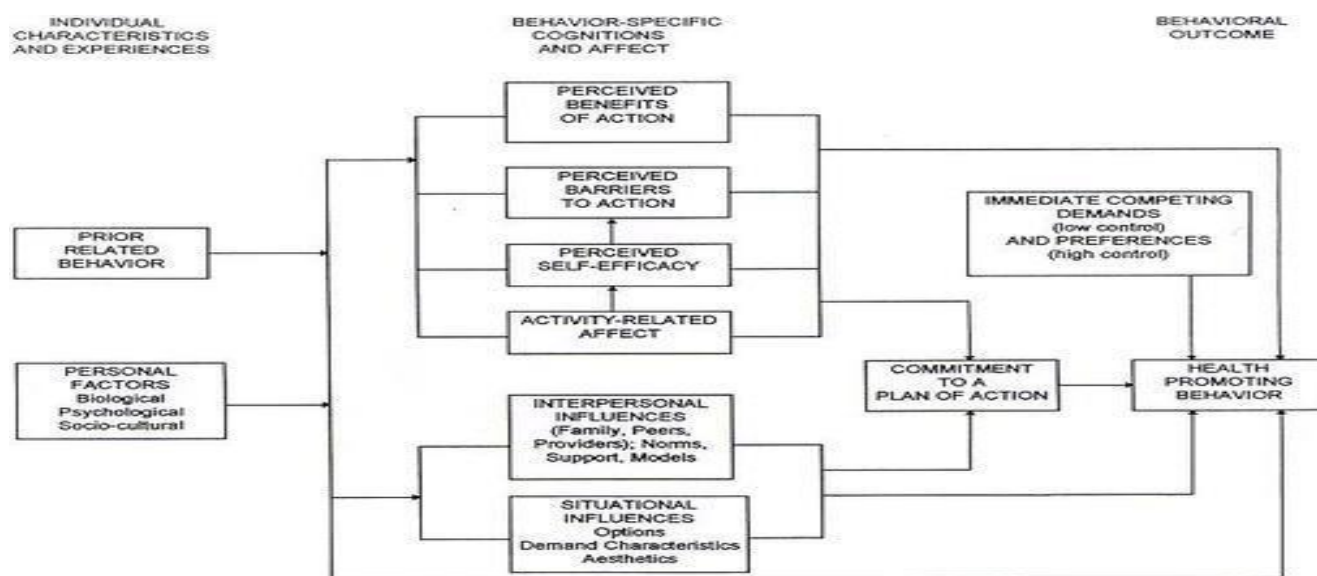
Behavior-Specific Cognitions and Affect. This is the focal point of the HPM, and it covers perceived benefits of action, perceived barriers to action, perceived self-efficacy, activity-related affect, and interpersonal and situational influences (Pender, Murdaugh, & Parsons, 2015). Then nurse – led health education intervention was designed to target behavior-specific cognitions and affect by increasing knowledge, debunking myths and raising self-confidence (Aqdam & Darward, 2018).

Interpersonal relationships, such as support from a husband and healthcare providers, also play a part here. In Ugandan communities, men have considerable say in their wives' health decisions. Therefore, targeting male participants was a means of leveraging interpersonal influences to encourage women to engage in screening (Roudsari et al., 2023).

Behavioral Outcomes. The expected outcome of the intervention was improved cervical cancer knowledge among women and men following participation in the nurse-led health education programme. Improved knowledge is expected to enhance awareness of risk factors,

symptoms, prevention, and available screening services, thereby laying the foundation for future health-promoting behaviors as described by the Health Promotion Model (Pender et al., 2015)

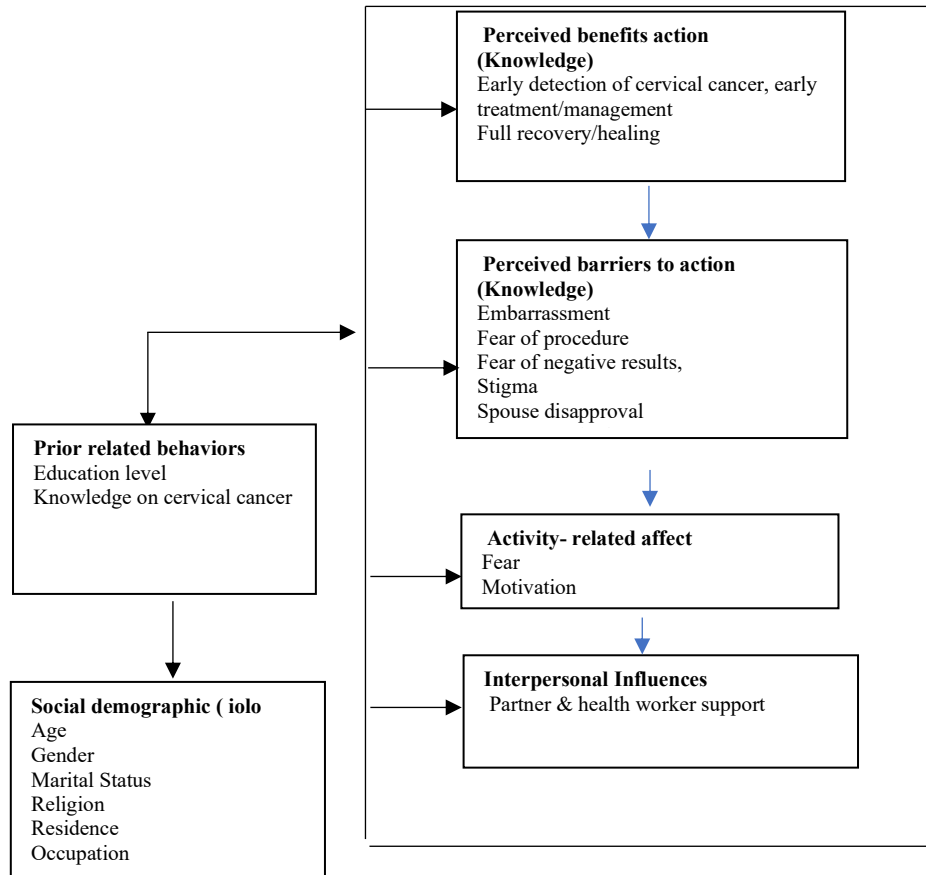
Figure 1: The Pender's Health Promotional Model



The Theoretical Diagram of the Health Promotion Model (Pender, 2012, p. 2).

Figure 2: Conceptual Framework

**INDIVIDUAL
CHARACTERISTICS
AND EXPERIENCES**



Operational Definition of Variables

Cervical cancer is a disease where cells of the cervix grow abnormally and if left untreated, they become malignant (Centers for Disease Control and Prevention (CDC) 2013).

Health promotion is an intervention taken to increase awareness about cervical cancer and its screening.

Cervical cancer knowledge outcome (dependent variable). It refers to the level of knowledge achieved about the risk factors, symptoms, prevention measures, and screening facilities of cervical cancer and was measured by achieving a total score from a 21-item validated questionnaire. Again, scores are classified as follows: excellent (80–100%), very good (70–79%), good (60–69%), average (50–59%), and poor (below 50%) (WHO, 2021).

Health education is any combination of learning experiences designed to help individuals and communities improve their health by increasing knowledge, influencing motivation, and improving health literacy (WHO, 2021).

Chapter Summary

This first chapter has provided an outline of the background, the statement of the problem, the study objectives, the significance, and the theoretical framework underpinning the study. The Health Promotion Model is the framework through which the individual, cognitive and social determinants of cervical cancer screening behaviors are viewed. The review of pertinent literature, including the global burden of cervical cancer, knowledge trends and the efficacy of educational interventions, will be presented in the second chapter.

Chapter Two: Literature Review

This chapter reviews literature on cervical cancer as a worldwide and national public health problem, the factors influencing knowledge of cervical cancer among women and men, and the role of nurse-led health education interventions in improving knowledge.

The literature reviewed is organized according to the study objectives and guided by Pender's Health Promotion Model. Relevant literature was obtained from peer-reviewed journals and authoritative sources, including the World Health Organization (WHO), PubMed, and Google Scholar.

Cervical Cancer as a Global Public Health Problem

Cervical cancer is the fourth most common cancer among women worldwide, and remains a public health concern. According to the World Health Organization (WHO, 2023), approximately 660,000 new cases and 350,000 deaths occurred globally in 2022.

More than 90% of cervical cancer occur in the developing countries, which reflecting persistent inequalities in access to human papillomavirus (HPV) vaccination, early detection, timely diagnosis, and treatment (WHO, 2024; Singh et al., 2023). Without accelerated prevention and control measures, the global burden of cervical cancer is projected to increase substantially over the coming decades due to population growth and ageing, particularly in regions with limited healthcare resources (Bray et al., 2024).

The burden of cervical cancer is particularly high in Africa. The continent records some of the highest incidence and mortality rates worldwide because of limited HPV vaccination coverage, inadequate awareness, delayed diagnosis, and restricted access to treatment services (WHO, 2024; Ghufuran et al., 2023). Eastern Africa is among the regions most affected by cervical cancer, with the disease remaining one of the leading causes of cancer-related deaths among women. In Uganda,

cervical cancer is the most common cancer among women. The country reports approximately 6,959 new cases and 4,607 deaths annually, representing one of the highest cervical cancer burdens in sub-Saharan Africa (ICO/IARC HPV Information Centre, 2023; Uganda Ministry of Health, 2020).

Primary prevention through HPV vaccination and secondary prevention through early detection remain the most effective strategies for reducing cervical cancer morbidity and mortality. The World Health Organization recommends HPV vaccination, high-performance HPV testing as the preferred screening method where available, and visual inspection with acetic acid (VIA) in settings with limited resources (World Health Organization, 2021; World Health Organization, 2024). However, despite the availability of these preventive interventions, utilization remains low in many low-resource settings. Limited knowledge of cervical cancer, misconceptions about the disease, fear, cultural beliefs, and inadequate access to health information continue to hinder the uptake of preventive services. Consequently, health education interventions aimed at improving knowledge are considered an essential component of comprehensive cervical cancer prevention programmes.

Knowledge of Cervical Cancer

Knowledge of cervical cancer, including its causes, risk factors, signs and symptoms, prevention, and available screening services, is essential for informed decision-making and forms the basis for adopting health-promoting behaviors. According to Pender's Health Promotion Model, knowledge influences perceived benefits, self-efficacy, and commitment to actions that promote health (Pender et al., 2015; Rezapour et al., 2025).

However, studies in Uganda show considerable knowledge gaps regarding female genital cancer. Mukama et al. (2017) reported that although many women in Eastern Uganda had heard

of cervical cancer, specific knowledge regarding cervical cancer prevention and screening remained limited, and misconceptions about the disease were common. Although general awareness of cervical cancer has improved in many low- and middle-income countries, detailed knowledge of human papillomavirus (HPV), the primary cause of cervical cancer, remains limited. Studies conducted in sub-Saharan Africa have shown that many women are aware of cervical cancer but have inadequate knowledge of HPV infection, its mode of transmission, and its role in the development of cervical cancer (Ndejjo et al., 2017; Mwaka et al., 2021). Furthermore, misconceptions and socio-cultural beliefs continue to influence knowledge and health-seeking behavior. In some communities, cervical cancer is associated with witchcraft, promiscuity, curses, or divine punishment, leading to stigma, fear, and delayed access to preventive health services (Eze, Obiechina, Agu, Ezeoke, & Ndu, 2022; Finocchiaro-Kessler et al., 2016).

Understanding the risk factors associated with cervical cancer is important because it helps individuals recognize their likelihood of developing the disease and encourages them to adopt preventive health practices. Within Pender's Health Promotion Model, knowledge increases individuals' confidence (self-efficacy), enhances perceived benefits of preventive behavior, reduces perceived barriers, and strengthens commitment to adopting health-promoting behaviors such as seeking information and utilizing available preventive service (McBride, 2022; Diabelková et al., 2023). Despite the importance of this knowledge, studies conducted in Uganda and other low-resource settings indicate that many community members have limited awareness of these risk factors, which may reduce their participation in screening and other preventive measures (Ndejjo et al., 2016; Getachew et al., 2020).

Similarly, it has been shown that men's knowledge and support strongly influence women's decisions to seek screening, especially in African societies where household-level health decisions

tend to be male-mediated (Roudsari et al., 2023; Osuafor et al., 2023). Men's knowledge of cervical cancer also plays an important role in promoting family health. In many African settings, men influence healthcare decisions and access to health services. Men's knowledge of cervical cancer also plays an important role in promoting family health. In many African settings, men influence healthcare decisions and access to health services. When men possess adequate knowledge about cervical cancer, they are more likely to encourage discussions about the disease, support women's participation in educational programmes, and promote timely utilization of preventive services (Roudsari et al., 2023; Osuafor et al., 2023). Research indicates that women with supportive male partners regarding screening are three times more likely to be screened (Isabirye, 2022).

Effect of Health Education Interventions on Cervical Cancer Knowledge

Health education interventions based on Pender's Health Promotion Model and other health promotion approaches have consistently been associated with improvements in cervical cancer knowledge in sub-Saharan Africa. In Uganda, structured health education interventions have been shown to increase awareness of cervical cancer, its risk factors, warning signs, and preventive measures among community members (Ndejjo et al., 2016; Makadzange, Peeters, Joore, & Kimman, 2022). Similarly, evidence from systematic reviews conducted in low- and middle-income countries indicates that educational interventions significantly improve knowledge of cervical cancer and increase awareness of available prevention strategies, particularly when education is delivered through culturally appropriate community-based approaches (Black, Hyslop, Richmond, 2019; Musa et al., 2017).

Despite these improvements, important knowledge gaps continue to exist. Many women and men remain unaware that persistent infection with high-risk human papillomavirus (HPV) is the primary cause of cervical cancer, and misconceptions regarding the disease, its prevention, and

the recommended age for preventive services remain common across sub-Saharan Africa (WHO, 2023; Ndejjo et al., 2016). Within this context, nurse-led health education interventions delivered through trusted community platforms such as faith-based institutions may provide an opportunity to improve cervical cancer knowledge among women and men. However, limited evidence is available on the effect of structured nurse-led health education interventions involving both women and men in faith-based community settings in Uganda. Therefore, the present study evaluated the effect of a nurse-led health education intervention on cervical cancer knowledge among women and men in Ssabagabo-Makindye Sub-County, Wakiso District.

The next chapter presents the study methodology, including the research design, study setting, study population, sampling procedures, data collection instruments, validity and reliability of the research instrument, data collection procedures, data analysis, quality control measures, and ethical considerations.

Chapter Three: Methodology

In this chapter, the overall framework and the materials used in this investigation are presented from a methodological perspective. It elaborates on the research design, study population, study venue, sampling methods, sample size determination, inclusion and exclusion criteria, data collection tools, methods for ensuring data quality, intervention procedures, data management and analysis, and ethical considerations.

Study Design

The study employed a one-group quasi-experimental design to determine the effect of a nurse-led health educational intervention on knowledge of cervical cancer among women and men in Ssabagabo-Makindye Sub-County, Wakiso District. The nurse-led health education intervention constituted the main intervention and involved structured health education on cervical cancer, including its definition, risk factors, signs and symptoms, prevention, and screening. Participants' knowledge was assessed before the intervention to establish the baseline and after completion of the training to determine the change in knowledge attributable to the intervention.

A quasi-experimental design was considered appropriate because random assignment of participants to intervention and control groups was not feasible within the church setting. This design is commonly used in nursing and public health research to evaluate the effectiveness of educational interventions conducted under real-life conditions where experimental control is limited (Polit & Beck, 2017; Creswell, 2014). This approach is widely used in health educational intervention studies to evaluate immediate knowledge acquisition following health education programmes. However, it measures short-term learning rather than long-term knowledge retention, which is acknowledged as a limitation of this study (Pender, Murdaugh, & Parsons, 2015; Polit &

Beck, 2017). Therefore, the pre- and post-intervention assessments were measurement procedures used to evaluate the effect of the nurse-led health education rather than being the study itself.

Study Population

The study population comprised adult women and men attending two selected Church of Uganda congregations in Bunamwaya Parish, Ssabagabo–Makindye Sub- County, Wakiso District, Uganda. Eligible participants included women aged 21–65 years and men aged 21 years and above who met the study inclusion criteria. Women were included because they are the primary population at risk of developing cervical cancer, while men were included because they play an important role in influencing women's health-related decision-making, including participation in cervical cancer prevention and early detection programmes. Increasing knowledge among both women and men has been recommended as an important strategy for improving awareness and supporting cervical cancer prevention in communities (Ndejjo et al., 2016; Pender, Murdaugh, & Parsons, 2015).

Study Setting

The study was conducted at two selected Church of Uganda congregations located in Bunamwaya Parish, Ssabagabo–Makindye Sub- County, Wakiso District, Uganda. The study area was purposively selected because it has a large and diverse population and provides an appropriate community setting for implementing health education interventions.

Wakiso District is the most populous district in Uganda and surrounds Kampala, the capital city. According to the Uganda Bureau of Statistics (2016), the district has experienced rapid population growth and increasing urbanization, making community-based health promotion activities particularly important. Churches were selected as study sites because they serve as established community gathering places, providing an opportunity to reach both women and men

through organized health education programmes. The selection of the study sites was consistent with the study objective of evaluating a nurse-led educational intervention aimed at improving knowledge of cervical cancer among adult community members.

Sampling Strategy

A combination of simple random sampling and convenient sampling was used in this study. A simple random sampling technique was used to select the study churches in Bunamwaya Parish, Makindye-Ssabagabo Municipality, Wakiso District, based on their accessibility and suitability for implementing the nurse-led health education intervention. Two Church of Uganda churches, namely Seguku and Nfufu churches were selected for the study. The study population was divided into two participant groups, namely women and men who attended the selected churches and met the eligibility criteria. Participants were recruited after church services and were approached by the researcher and research assistants. Eligible women aged 21–65 years and men aged 21 years and above who were able to communicate in English or Luganda and provided informed consent were included in the study. Participants who did not meet the eligibility criteria or declined to participate were excluded. The required participants were recruited from the two selected churches until the desired sample size was obtained. This sampling procedure enabled the researcher to include both women and men in the nurse-led cervical cancer educational intervention.

Sample Size

The sample size was determined using Yamane's (1967) formula for calculating sample size from a finite population. The formula is appropriate when the population size is known and a specified level of precision is desired.

$$n = N / [1 + N(e)^2]$$

Where:

- n = sample size required
- N = 105,900 (estimated population).

- $e = 0.058$ (margin error)

Substituting the values into the formula:

$$n = 1 + 105,900(0.058)^2 / 105,900$$

$$n = 1 + 105,900(0.003364) / 105,900$$

$$n = 357,2476 / 105,900 = 296.43$$

Therefore, the calculated sample size was approximately 297 participants. During the study period, 245 eligible participants were successfully recruited and completed both the pre-intervention and post-intervention assessments, representing 82.5% of the calculated sample size 297.

Inclusion and Exclusion Criteria

Inclusion Criteria. Participants were women aged 21 to 65 years and men aged 21 years and above who were able to understand and communicate in English or Luganda and were willing to provide written informed consent.

Exclusion Criteria. Participants were excluded if they were: below 21 years of age; had cognitive problems which hindered their ability to answer the questionnaire; or did not agree to provide written informed consent (Ndawula, 2022).

Intervention

The study employed a nurse-led health education intervention aimed at improving participants' knowledge of cervical cancer and its screening. The intervention involved the delivery of structured cervical cancer information and education by the nurse, covering key areas including the meaning of cervical cancer, risk factors, signs and symptoms, prevention, and cervical cancer screening. Participants received the training through a structured and interactive health education session which lasted 60 minutes. The session included health education, explanations, question-and-answer sessions, and supporting educational materials. Following the training intervention, participants' knowledge of cervical cancer and its screening was re-assessed

to determine the change from their baseline knowledge. The post-intervention assessment was done immediately after the one-hour session. The observed change in knowledge between the pre-intervention and post-intervention assessments provided evidence of the effect of the nurse-led health educational intervention on participants' cervical cancer knowledge.

Implementation Procedure

Recruitment took place through June-July 2023. The researcher together with trained research assistants invited potential participants for the study right after the end of the church services. In both English and Luganda, detailed explanations about study objectives, procedures, benefits, and risks were provided. Eligibility was determined by age criteria and willingness to participate. Participants who were willing and deemed eligible completed a baseline questionnaire (pre-intervention). The nurse-led health educational intervention was clearly defined and incorporated into the study implementation. The intervention was conducted over six weeks, with each teaching session lasting 20–30 minutes. The sessions provided structured education on cervical cancer, including its definition, risk factors, signs and symptoms, screening, recommended screening intervals, and benefits of early detection. Pre-intervention and post-intervention knowledge assessments were conducted to determine the effect of the nurse-led training. Participants were given the opportunity to interact, ask questions, and participate in the discussion. The same questionnaire was then administered again after the last session to assess changes in knowledge.

Data Collection Instrument

Data were collected using a structured questionnaire adapted from a validated instrument developed by (Ndejjo et al., 2016) and modified to align with the constructs of Pender's Health Promotion Model. The questionnaire consisted of two sections. The first section contained five

items on participants' socio-demographic characteristics, while the second section comprised 21 items assessing knowledge of cervical cancer.

The knowledge section was organized into five domains: (a) general knowledge of cervical cancer (6 items); (b) knowledge of risk factors (5 items); (c) knowledge of cervical cancer screening (4 items); (d) knowledge of the recommended age and screening intervals (3 items); and (e) perceived benefits of cervical cancer screening (3 items). All knowledge items were scored using binary responses (Yes = 1, No = 0). Individual item scores were summed to obtain a composite knowledge score. Knowledge levels were categorized according to the percentage of correct responses as excellent (80–100%), very good (70–79%), good (60–69%), average (50–59%), and poor (<50%), categories were defined by the researcher based on the percentage scores.

Data Collection Procedure

Approval to conduct the study was obtained from the Uganda Christian University Research Ethics Committee and the relevant administrative authorities before commencement of data collection. Permission was also obtained from the leadership of the selected Church of Uganda congregations. Eligible participants were identified after church services and were informed about the purpose, procedures, potential benefits, and voluntary nature of the study. Those who agreed to participate provided written informed consent before enrolment.

Prior to the educational intervention, participants completed a structured pre-test questionnaire to assess their baseline knowledge of cervical cancer.

The researcher, who is a registered nurse, then delivered a structured health educational session using PowerPoint presentations, interactive discussions, question-and-answer sessions, and educational pamphlets. The educational content covered the definition of cervical cancer, risk

factors, signs and symptoms, methods of prevention, recommended screening age and intervals, and the importance of early detection.

Participants were encouraged to ask questions and actively participate throughout the educational session. Immediately after completion of the health education session, the same questionnaire was re-administered to assess changes in participants' knowledge following the intervention. Completed questionnaires were checked daily for completeness and consistency before storage in a secure location.

Data Control

To ensure high-quality data, the questionnaire was adapted from previously validated instruments and reviewed by the research supervisor for clarity, relevance, and completeness. A pilot study was conducted to identify ambiguous questions and improve the instrument before the main study. Research assistant received training on the study objectives, ethical considerations, participant recruitment, and standardized questionnaire administration.

The questionnaire was translated into Luganda and independently back-translated into English to ensure conceptual and semantic equivalence. During data collection, completed questionnaires were checked daily for completeness, consistency, and accuracy. Data were coded, entered into Stata version 15, cleaned, and verified before statistical analysis.

Data Quality Assurance

Validity. Content validity was established by adapting the questionnaire from previously validated instruments and aligning it with the constructs of Pender's Health Promotion Model. The questionnaire was reviewed by the research supervisor to assess the relevance, clarity, and adequacy of the items in addressing the study objectives. Recommendations from the supervisor and findings from the pilot study were incorporated before final data collection.

Reliability. Was enhanced through the use of standardized data collection procedures. The questionnaire underwent translation and back-translation to maintain consistency between the English and Luganda versions. Research assistant was trained using standardized procedures, and data collection was closely supervised throughout the study. In addition, data coding and entry followed standardized protocols to minimize errors and ensure consistency.

Data Analysis

Completed questionnaires were checked for completeness, coded, and entered into Stata version 15 for analysis. Data cleaning was performed before statistical analysis to identify and correct data entry errors and inconsistencies. Descriptive statistics were used to summarize participants' socio-demographic characteristics and knowledge scores. Categorical variables were summarized using frequencies and percentages, while continuous variables were summarized using means and standard deviations. Knowledge scores were calculated by assigning one point for each correct response and zero for each incorrect response. Individual scores were summed to obtain a composite knowledge score for each participant. The effectiveness of the nurse-led health education intervention was evaluated by comparing pre-test and post-test mean knowledge scores using the paired-samples t-test. A p-value of less than 0.05 was considered statistically significant. This systematic process of defining the intervention, measuring the outcome before and after health education and statistically testing the observed change provided scientific evidence for evaluating the effect of the Nurse-led health education intervention.

Ethical Considerations.

Ethical approval to conduct this study was obtained from the Uganda Christian University Research Ethics Committee (UCU-REC) before commencement of the study. Administrative permission was also obtained from the relevant church authorities in Bunamwaya Parish,

Makindye–Ssabagabo Municipality, Wakiso District, where the study was conducted. The study adhered to the ethical principles of respect for persons, beneficence, non-maleficence, and justice throughout the research process.

Voluntary Participation and Informed Consent

Participation in the study was entirely voluntary. Eligible participants were provided with adequate information regarding the purpose of the study, study procedures, potential risks and benefits, and their rights as research participants. They were given sufficient time to ask questions before deciding whether to participate. Written informed consent was obtained from each participant before enrolment into the study. Participants were informed that they had the right to decline participation or withdraw from the study at any time without any penalty, loss of benefits, or adverse consequences.

Risks and Benefits

The study posed minimal risk to participants because the educational intervention consisted of a nurse-led health education session on cervical cancer knowledge. However, some participants could have experienced mild emotional discomfort when discussing cervical cancer or related health issues. To minimize this risk, the educational sessions were conducted respectfully in a supportive environment, and participants were informed that they could decline to answer any question that made them uncomfortable or withdraw from the study at any stage without consequences. Participants who required additional information or counselling were referred to appropriate healthcare providers.

Although there were no direct financial or material benefits, participants benefited from increased knowledge about cervical cancer, including its risk factors, signs and symptoms, methods of prevention, and the importance of early detection. The findings of the study may also

contribute to improved community health education programmes and provide evidence to inform future public health interventions aimed at increasing cervical cancer awareness in Uganda.

Confidentiality and Privacy

Participants' privacy and confidentiality were strictly maintained throughout the study. Personal identifiers such as names were not recorded on the questionnaires. Instead, unique identification codes were assigned to each participant to ensure anonymity. All completed questionnaires and study records were stored securely in a locked cabinet, while electronic data were password-protected and accessible only to the researcher and the research supervisor. Data will be retained according to the university's research policy and then disposed of securely. Study findings will be presented only in aggregate form so that no individual participant can be identified.

Justice and Fair Treatment

All eligible individuals who met the inclusion criteria were given an equal opportunity to participate in the study without discrimination based on age, sex, religion, ethnicity, or socioeconomic status. Participants were treated with dignity and respect throughout the research process.

Chapter Summary

This chapter specifies the study's methodology, including the quasi-experimental design, population and sampling, intervention, data collection, quality assurance, and ethics. The subsequent chapter reports the findings after the analysis of data collected before and after the intervention.

Chapter Four: Findings of the Study

In this chapter, the findings of the nurse-led health educational intervention implemented with 245 adult men and women in Bunamwaya Parish, Makindye-Ssabagabo Municipality, Wakiso District, are presented. Four major parts of the chapter include the following: (1) socio-demographic features of the study subjects; (2) baseline (pre-intervention) knowledge regarding cervical cancer and its screenings; (3) post-intervention knowledge; and (4) comparison of pre- and post-intervention knowledge using independent samples t-tests (both domain-based and item-based).

Socio- Demographic Characteristics of Study Participants

Table 1

Socio-Demographic Characteristics of Study Participants (N=245)

Variable	Frequency	Percentage
Age (yrs)		
21–30	74	30.2
31–40	83	33.9
41–50	51	20.8
51–60	26	10.6
61–70	11	4.5
Total	245	100.0
Gender		
Female	152	62.0
Male	93	38.0
Total	245	100.0
Marital Status		
Single	84	34.3
Married	103	42.0
Divorced	24	9.8
Separated	22	9.0
Widowed/Other	12	4.9
Total	245	100.0
Level of Education		
No formal education	26	10.6
Primary	37	15.1
Secondary	89	36.3
Diploma or University	93	38.0
Total	245	100.0
Occupation		
Student	23	9.4
Private Employee	157	64.1
Government Employee	47	19.2
Housewife	18	7.3
Total	245	100.0

Table 1 presents findings showing the largest age category comprised 31- 40 years- old participants followed by 30% aged 21- 30 years. Women instituted the larger proportion of the sample size (62%), while men made up to 38%. In terms of marital status, 42% were married, followed by (34%) single. Thirty- eight percent (38%) had attained tertiary or university – level education and a considerable proportion of (36 %) had secondary education.

Baseline Knowledge of Cervical Cancer and Screening among Respondents

Knowledge of cervical cancer of cervical cancer and screening is a predisposing factor that inspires preventive behavior (Pender, 2019). Table 2 displays the frequency of correct responses to each of the 21 knowledge items at baseline (pre-intervention), arranged by knowledge domain.

Table 2

Baseline Knowledge of Respondents on Cervical cancer and its Screening (Before -Intervention) N = 245

Knowledge Item	Yes n (%)	No n (%)	Mean	SD
Domain A: General Knowledge of Cervical Cancer				
Cervical cancer is a disease	238 (97.1%)	7 (2.9%)	0.97	0.17
Persistent vaginal discharge is a sign of cervical cancer	164 (66.9%)	81(33.1%)	0.67	0.47
Vaginal bleeding between menstrual periods is a sign	164 (66.9%)	81(33.1%)	0.67	0.47
Vaginal bleeding after menopause is a sign	165 (67.6%)	80 (32.7%)	0.67	0.47
Discomfort or pain during sex is a sign	169 (69.0%)	76 (31.0%)	0.69	0.46
Vaginal bleeding during or after sex is a sign	169 (69.0%)	76 (31.0%)	0.69	0.46
<i>Domain A Subtotal</i>	178 (72.7%)	67 (27.3%)	4.36	1.06
Domain B: Risk Factors				
Poor hygiene is a risk factor for cervical cancer	216 (88.5%)	29 (11.5%)	0.88	0.32
Multiple sexual partners predispose to cervical cancer	177 (72.2%)	68(27.8%)	0.72	0.45
Early marriage below 18 years) predisposes to cervical cancer	162 (66.4%)	83(33.9 %)	0.66	0.47
Unprotected sexual practice before 18 years predisposes to cervical cancer	168 (68.6%)	77(31.4%)	0.69	0.46
A family history of cervical cancer is a risk factor	206 (84.1%)	39(15.9%)	0.84	0.37
<i>Domain B Subtotal</i>	186 (75.8%)	59(24.2%)	3.79	0.94
Domain C: Screening Knowledge				
Have you heard about cervical cancer screening?	186 (75.9%)	59 (24.1%)	0.76	0.43
Undergoing cervical cancer screening is a good is a good practice	185 (75.5%)	60(24.5%)	0.76	0.43
The screening test aims to detect cervical cancer early	175 (71.4%)	70(28.6%)	0.71	0.45
It is necessary to undergo the screening test	186 (75.9%)	59(24.1%)	0.76	0.43
<i>Domain C Subtotal (mean % correct)</i>	183 (74.7%)	62(25.3%)	2.99	0.87
Domain D: Age and Frequency of Screening				
Women aged 20–30 years should screen every 3 years	158 (64.5%)	87 (35.5%)	0.64	0.48
Women aged 31–50 years should screen every 3–5 years	161 (65.7%)	84 (34.3%)	0.66	0.47
Women aged 50 plus should NOT be screened	154 (62.9%)	91(37.1%)	0.63	0.48
<i>Domain D Subtotal</i>	158 (64.4%)	87(35.6%)	1.93	0.83
Domain E: Perceived Benefits of Screening				
Screening is meant for the early detection of cervical cancer	227 (92.7%)	18(7.3%)	0.93	0.26
Screening allows the detection of abnormal changes in the cervix	226 (92.2%)	19 (7.8%)	0.92	0.27
Early detection allows early treatment and full recovery	230 (93.9%)	15 (6.1%)	0.94	0.24
<i>Domain E Subtotal</i>	228 (92.9%)	17 (7.1%)	2.79	0.44
Overall Composite Knowledge Score Out of 21)	75.5%	24.5%	15.86	1.91

Table 2 indicates that majority of participants (92%) correctly identified benefits of screening. While more than 97.1% of participants recognized that cervical cancer is a disease. This high level of awareness proposes that participants realize the severity of the disease. Regarding frequency of screening and age knowledge scores were significantly low, with only 62.9% of participants correctly recognizing that women older than 50 should not be excluded from screening, a critical error for women in this age group. In terms of mean baseline (prior to intervention) knowledge score, the average obtained score was 15.86 (SD = 5.74) on 21 questions, which translates to an average score of 75.5%.

Table 3*Pre-Intervention Knowledge Category Distribution (N = 245)*

Knowledge Category	Frequency (n)	Percentage (%)
Excellent ($\geq 80\%$)	134	54.7
Very Good (70–79%)	16	6.5
Good (60–69%)	24	9.8
Average (50–59%)	17	6.9
Poor ($< 50\%$)	54	22.0
Total	245	100.0

Note. Knowledge categories based on WHO (2021) grading: Excellent $\geq 80\%$; Very Good 70–79%; Good 60–69%; Average 50–59%; Poor $< 50\%$.

Findings in Table 3 indicated the knowledge categories, based on pre-intervention levels, approximately half of the participants (54.7%, $n = 134$) demonstrated excellent knowledge levels (scores $\geq 80\%$), whereas 22.0% ($n = 54$) demonstrated poor knowledge levels (scores $< 50\%$).

Post-Intervention Knowledge on Cervical Cancer and Screening

Health education interventions can ensure that females are aware about predisposing factors of cervical cancer, and benefits of checking for cervical cancer which can promote cervical cancer screening.

Table 4

Knowledge of Respondents on Cervical Cancer and its Screening after the Nure-led health education Intervention (After-Intervention) N = 245

Knowledge Item	Yes (%)	No (%)	Mean	SD
Domain A: General Knowledge of Cervical Cancer				
Cervical cancer is a disease	244(99.6%)	1 (0.4%)	1.00	0.06
Persistent vaginal discharge is a sign of cervical cancer	193(78.8%)	52(21.2%)	0.79	0.41
Vaginal bleeding between menstrual periods is a sign	182(74.3%)	63(25.7%)	0.74	0.44
Vaginal bleeding after menopause is a sign	183(74.4%)	62(25.6%)	0.75	0.43
Discomfort or pain during sex is a sign	188(76.1%)	57(23.3%)	0.77	0.42
Vaginal bleeding during or after sex is a sign	189(77.1%)	56(22.9%)	0.77	0.42
<i>Domain A Subtotal</i>	197(80.2%)	48(19.8%)	4.81	0.9
Domain B: Risk Factors				
Poor hygiene is a risk factor for cervical cancer	211(86.1%)	34(13.9%)	0.86	0.35
Multiple sexual partners predispose to cervical cancer	196(80.0%)	49(20.0%)	0.80	0.40
Early marriage below 18 years predisposes to cervical cancer	178(72.7%)	67(27.3%)	0.73	0.45
Unprotected sexual practice before 18 years predisposes to cervical cancer	187(76.3%)	58(23.7%)	0.76	0.43
A family history of cervical cancer is a risk factor	208(84.9%)	37(15.1%)	0.85	0.36
<i>Domain B Subtotal</i>	196(80.0%)	49(20.0%)	4.00	0.89
Domain C: Screening Knowledge				
Have you heard about cervical cancer screening?	204(83.3%)	41(16.7%)	0.83	0.37
Undergoing cervical cancer screening is a good practice	209(85.3%)	36(14.7%)	0.85	0.35
The screening test aims to detect cervical cancer early	205(83.7%)	40(16.3%)	0.84	0.37
It is necessary to undergo the screening test	211(86.1%)	34(13.9%)	0.86	0.35
<i>Domain C Subtotal</i>	207(84.6%)	38(15.4%)	3.38	0.72
Domain D: Age and Frequency of Screening				
Women aged 20–30 years should screen every 3 years	192(78.4%)	53(21.6%)	0.78	0.41
Women aged 31–50 years should screen every 3–5 years	185(75.5%)	60(24.5%)	0.76	0.43
Women aged 50 plus should NOT be screened	161(65.7%)	84(34.4%)	0.66	0.47
<i>Domain D Subtotal</i>	179(73.2%)	66(26.8%)	2.20	0.76
Domain E: Perceived Benefits of Screening				
Screening is meant for the early detection of cervical cancer	236(96.3%)	9(3.7%)	0.96	0.19
Screening allows the detection of abnormal changes in the cervix	231(94.3%)	14(5.7%)	0.94	0.23
Early detection allows early treatment and full recovery	233(95.1%)	12(4.9%)	0.95	0.22
<i>Domain E Subtotal</i>	233(95.2%)	12(4.8%)	2.86	0.37
OVERALL COMPOSITE KNOWLEDGE SCORE OUT OF 21)	82.1%	17.9%	17.25	1.71

Note. Mean composite post-intervention score = 17.25 (SD = 5.09) out of 21, equivalent to 82.1%

correctness

The findings in Table 4 indicate that participants generally had good knowledge regarding cervical cancer, with an overall mean knowledge score of 82.1%. Knowledge was highest in the domain of perceived benefits of screening (95.2%), while the lowest knowledge levels were observed in the age and frequency of screening domain (73.2%). Nearly all participants correctly identified cervical cancer as a disease (99.6%), whereas fewer participants correctly understood that women aged above 50 years should continue screening.

Table 5*Post -Intervention Knowledge Category Distribution (N = 245)*

Knowledge Category	Frequency (n)	Percentage (%)
Excellent ($\geq 80\%$)	166	67.8
Very Good (70–79%)	14	5.7
Good (60–69%)	13	5.3
Average (50–59%)	16	6.5
Poor ($< 50\%$)	36	14.7
Total	245	100.0

The findings in Table 5 shows average composite knowledge score post-intervention was 17.25 (SD = 5.09) out of 21 (82.1% correctness). Improvements were observed in all domains compared with the pre-intervention period.

Comparison of Pre- vs. Post-Knowledge Scores

The effect of the nurse-led health educational intervention on knowledge regarding cervical cancer and its prevention determined by comparing the composite knowledge scores of the pre- and post-interventions of the same group (both $n = 245$). An independent-samples t-test was conducted to compare the two sets of composite knowledge scores. Statistical significance was set at $p < .05$.

Table 6

Overall, Knowledge Score Comparison

Measure	Pre-test Mean (SD)	Post-test Mean (SD)	Diff	t (df = 488)	p-value
Composite Knowledge Score	15.86 (5.74)	17.25 (5.09)	+1.39	2.831	.005**

Note. ** $p < .01$. Cohen's $d = 0.26$ (small effect). Two-tailed test, equal variances not assumed.

The findings in Table 6, indicate results of the comparison of overall knowledge scores. The mean knowledge score was higher by 1.39 points (mean = 15.86; SD = 5.74 before intervention vs mean = 17.25; SD = 5.09 after intervention). Using an independent-samples t-test, this difference in means was statistically significant ($t = 2.831$, $df = 488$, $p = .005$, $d = 0.26$), indicating a small yet important effect of the educational intervention.

Table 7*Domain-Level Independent Samples t-Test — Pre- vs. Post-Intervention Knowledge*

Knowledge Domain	Pre-Mean (SD)	Post Mean (SD)	Diff	t (df=488)	p-value
A. General CC Knowledge (max = 6)	4.36 (2.11)	4.81 (1.78)	+0.45	2.543	.011*
B. Risk Factors (max = 5)	3.79 (1.49)	4.00 (1.47)	+0.21	1.557	.120
C. Screening Knowledge (max = 4)	2.99 (1.61)	3.38 (1.33)	+0.40	2.969	.003**
D. Age/Frequency of Screening (max=3)	1.93 (1.29)	2.20 (1.17)	+0.27	2.377	.018*
E. Perceived Benefits (max = 3)	2.79 (0.72)	2.86 (0.57)	+0.07	1.185	.236

Note. * $p < .05$; ** $p < .01$. Two-tailed independent samples *t*-tests. *df* = 488 for all comparisons. Pre *N* = 245, Post *N* = 245.

Findings in Table 7 indicate that the health educational intervention resulted in improvements across all knowledge domains. There were significant increases were observed in general cervical cancer knowledge (Mean difference = 0.45, $t = 2.543$, $p = .011$), screening Knowledge (Mean difference = 0.40, $t = 2.969$, $p = .003$), and age/frequency of screening knowledge (Mean difference = 0.27, $t = 2.377$, $p = .018$). Although mean scores for risk factors and perceived benefits of screening increased after the intervention, the differences were not statistically significant ($p = .120$ and $p = .236$, respectively).

Summary

This chapter summarized the results obtained through real data analysis. Prior to the intervention, the average level of knowledge, measured on a composite scale, was 15.86 (SD = 5.74, 75.5%), and after the intervention, it was 17.25 (SD = 5.09, 82.1%). As expected, the improvement was statistically significant overall: according to an independent samples t-test, $t = 2.831$, $df = 488$, $p = .005$, Cohen's $d = 0.26$. Significant improvements occurred in general cervical cancer knowledge ($p = .011$), screening knowledge ($p = .003$), and age/frequency of Screening ($p = .018$). The domains that did not show statistically significant change included: risk factors and perceived benefits due to a considerable ceiling effect in both domains prior to the intervention. The percentage of respondents who obtained excellent knowledge scores grew from 54.7% pre-intervention to 67.8% post-intervention, while poor knowledge scores became less frequent (from 22.0% to 14.7%). These results are discussed in Chapter Five.

Chapter Five: Discussion

This chapter focuses on the research findings and analyses them in relation to the study's objectives, the current literature, and the Health Promotion Model's theoretical implications. Besides this, it also presents the main conclusions and puts forward some recommendations for nursing practice, policy, and further research.

Socio-Demographic Characteristics

The study participants were predominantly female (81.6%) and young adults, with the largest proportion (42.9%) aged 21–30 years. This finding is consistent with previous Ugandan studies conducted in community settings, which reported higher participation of women than men in cervical cancer awareness and education programmes (Ndejjo et al., 2016; Mukama et al., 2017). The predominance of young adults is important because women in this age group are more likely to acquire human papillomavirus (HPV), the primary cause of cervical cancer, shortly after the onset of sexual activity. Consequently, nurse led education interventions targeting young adults are essential for improving knowledge and promoting informed decisions regarding cervical cancer prevention (WHO, 2022).

Most participants (79.6%) had attained at least secondary education, reflecting the relatively educated, peri-urban population from which the sample was drawn. This educational profile may partly explain the relatively high baseline knowledge observed in the present study. According to Pender's Health Promotion Model (HPM), personal characteristics such as educational attainment influence health-promoting cognitions and behaviors by enhancing an individual's ability to acquire, understand, and apply health information (Pender, Murdaugh, & Parsons, 2015). Similar findings have been reported in studies conducted in sub-Saharan Africa, where higher educational attainment was associated with greater awareness and knowledge of

cervical cancer and its prevention (Ndejjo et al., 2016; Getaneh, Tegene, & Belachew, 2021). These findings highlight the need for simplified and culturally appropriate educational interventions for individuals with lower levels of formal education.

Nearly half of the participants (47.8%) were married. Within Pender's Health Promotion Model, interpersonal influences, including support from spouses and family members, are recognized as important determinants of health-promoting behaviors (Pender et al., 2015). The inclusion of men in this study was therefore theoretically justified because male partners often influence women's health-related decisions, including participation in cervical cancer prevention and screening programmes. Recent qualitative evidence from Uganda demonstrates that male partner support, communication, and involvement positively influence women's willingness to seek cervical cancer screening services (Bouskill et al., 2024). These findings emphasize the importance of involving both women and men in community-based cervical cancer education programmes.

Baseline Knowledge of Cervical Cancer

The present study found an overall baseline knowledge score of 82.1%, which was classified as excellent. Although this finding suggests a relatively high level of general awareness of cervical cancer among the study participants, analysis of individual knowledge items revealed important gaps in specific areas. Nearly all participants (99.6%) correctly identified cervical cancer as a disease; however, only about three-quarters correctly identified key warning symptoms, including vaginal bleeding between menstrual periods and post-menopausal bleeding. These findings indicate that although participants were familiar with cervical cancer as a health condition, important misconceptions regarding its clinical presentation remained. Similar knowledge gaps have been reported in Ethiopia, where inadequate recognition of cervical cancer symptoms was

associated with delayed health-seeking and missed opportunities for early diagnosis (Getaneh, Tegene, & Belachew, 2021).

Knowledge regarding the recommended age and frequency of cervical cancer screening was the weakest domain, with a mean score of 73.2%. Only 65.7% of participants correctly recognized that women over 50 years of age should continue to undergo cervical cancer screening according to national recommendations. This misconception is of public health concern because advancing age remains an important risk factor for cervical cancer, and inadequate knowledge of recommended screening intervals may contribute to delayed detection of precancerous lesions and invasive disease (Uganda Ministry of Health, 2020; WHO, 2022). Comparable findings have been reported in Uganda, where studies have shown that although awareness of cervical cancer is relatively high, detailed knowledge of risk factors, symptoms, and screening recommendations remains incomplete (Ndejjo et al., 2016; Bouskill et al., 2024).

From the perspective of Pender's Health Promotion Model, these findings suggest that although participants possessed basic knowledge of cervical cancer, misconceptions regarding symptoms and recommended screening schedules may limit informed decision-making regarding cervical cancer prevention. The Health Promotion Model proposes that increasing knowledge enhances perceived benefits, reduces perceived barriers, and strengthens motivation to adopt health-promoting behaviors (Pender, Murdaugh, & Parsons, 2015). Consequently, the nurse-led health education intervention was designed to address these specific knowledge deficits and improve participants' understanding of cervical cancer prevention.

Effect of Nurse-Led Health Education Intervention on Cervical Cancer Knowledge

The findings of the present study demonstrated that the health education intervention significantly improved participants' knowledge of cervical cancer across all

knowledge domains ($p < .001$). The overall mean knowledge score increased from 17.25 before the intervention to 20.06 out of a possible 21 after the intervention, indicating that the educational programme was highly effective in improving participants' understanding of cervical cancer. These findings are consistent with previous studies conducted in Uganda and other low- and middle-income countries, which have shown that structured health education interventions significantly improve knowledge of cervical cancer and its prevention (Ndejjo et al., 2016; Bouskill et al., 2024; Musa et al., 2017).

The greatest improvements were observed in knowledge of cervical cancer symptoms and risk factors. This finding is important because recognition of risk factors and early warning signs enables individuals to make informed decisions regarding disease prevention and early detection. According to Pender's Health Promotion Model, increased knowledge enhances perceived vulnerability and perceived benefits, thereby strengthening individuals' motivation to adopt health-promoting behaviors (Pender, Murdaugh, & Parsons, 2015). The marked improvement in knowledge of recommended screening age and intervals further suggests that the nurse – led health education intervention successfully corrected misconceptions regarding cervical cancer prevention. Although this study did not assess screening behaviors, improved knowledge may facilitate informed decisions regarding future participation in cervical cancer screening programmes.

Although statistically significant improvements were observed across all knowledge domains, the smallest increase occurred in the perceived benefits domain because participants already demonstrated a high level of baseline knowledge (95.2%). This finding may reflect a maximum effect, whereby participants with high baseline scores have less opportunity for measurable improvement following an educational intervention. Nevertheless, the overall findings

demonstrate that a structured nurse-led health education intervention delivered within a community setting is an effective strategy for improving knowledge of cervical cancer. These findings support the propositions of Pender's Health Promotion Model, which emphasizes that increased knowledge is an important prerequisite for adopting health-promoting behaviors by enhancing perceived benefits and reducing perceived barriers (Pender et al., 2015).

Male Involvement and Interpersonal Influences

Although men constituted only 18.4% of the study population, they demonstrated they demonstrated substantial improvements in knowledge following the nurse-led health education intervention, indicating that the intervention was effective among both women and men. This finding supports the inclusion of men in community-based cervical cancer education programmes, particularly in settings where men play an important role in household health-related decision-making.

According to Pender's Health Promotion Model, interpersonal influences, including support from spouses, family members, and significant others, are important determinants of health-promoting behaviors (Pender, Murdaugh, & Parsons, 2015). Improved knowledge among men may therefore strengthen their ability to encourage informed decision-making regarding cervical cancer prevention and support women's participation in preventive health services.

The findings are consistent with recent qualitative evidence from Uganda, which showed that male partners influence women's decisions regarding cervical cancer prevention through emotional support, communication, financial assistance, and encouragement to seek screening services (Bouskill et al., 2024). Similar findings have been reported in sub-Saharan Africa, where community-based educational interventions that involve both women and men have been shown

to improve awareness of cervical cancer and promote supportive attitudes towards prevention (Musa et al., 2017).

While the present study did not assess behavioral outcomes such as cervical cancer screening uptake, the significant improvement in men's knowledge suggests that involving both sexes in health educational interventions may contribute to creating a supportive family and community environment for future cervical cancer prevention initiatives. This interpretation is consistent with Pender's Health Promotion Model, which proposes that increased knowledge and positive interpersonal influences facilitate the adoption of health-promoting behaviors.

Limitations of the Study

- The one-group design without a control group limits the ability to attribute knowledge gains exclusively to the intervention, as other confounding factors cannot be ruled out.
- Post-testing was conducted immediately following the intervention and therefore reflects short-term knowledge acquisition rather than long-term retention or behavioral change.
- The study was conducted in a single sub-county, which limits the generalizability of findings to other populations, particularly in rural or more remote settings.
- The church-based recruitment setting may have introduced selection bias, as participants may represent a more educated and health-engaged segment of the population than the general population.
- The study did not objectively measure actual screening attendance as a behavioral outcome; self-reported intentions and prior practices were the primary behavioral measures.

Contribution to Nursing Knowledge

This study provides evidence that nurse-led health community education interventions can have a significant impact on various domains of cervical cancer knowledge in Wakiso District, Uganda. Demonstrating the efficacy of the Health Promotion Model as a guiding framework, the study provides grounded evidence for designing and evaluating educational interventions for cervical cancer in low-resource African settings.

These study findings can serve as a basis for the expansion and standardization of nurse-led cervical cancer education as components of primary and community health care delivery in Uganda.

Areas for Further Study

- Longitudinal studies incorporating a control group and objective measurement of cervical cancer screening uptake are required to determine whether improvements resulting from nurse-led health education interventions are sustained and translate into behavioral changes.
- It would be useful to test the use of mHealth platforms and community health worker-delivered education to find the most effective alternatives which can be scaled to rural areas.
- Cervical cancer health education programs with gender-stratified outcomes should be researched to identify differences between knowledge gain, attitude change, and behavioral intention in women and men. This will facilitate tailoring interventions to best suit gender considerations.

Conclusion

Following completion of the six-week nurse-led health education intervention, all areas of knowledge showed significant improvements ($p < .001$), and the overall mean knowledge score increased to 95.5% (20.06/21).

Recommendations

To the Community Cervical Cancer Health Education Programmes

The study recommends that structured cervical cancer education programmes be strengthened within community settings, including churches and other community gathering places, to improve knowledge of cervical cancer among both women and men. Such programmes should address the identified knowledge gaps regarding cervical cancer risk factors, signs and symptoms, prevention, and screening.

Integration Of Nurse-Led Cervical Cancer Health Education Interventions

Based on the observed improvement in cervical cancer knowledge following the intervention, the study recommends the integration of structured nurse-led cervical cancer education into existing community health promotion programmes. The intervention may be implemented through churches, community outreaches, and other appropriate community platforms where women and men can be reached.

Health-Service and Programme Planning.

The study recommends that health-service managers and programme planners consider incorporating community-based cervical cancer education into routine health promotion activities. Particular attention should be given to information on the recommended age, frequency, benefits, and importance of cervical cancer screening to address the knowledge gaps identified at baseline.

Policy And Community Health Programming

The study recommends that relevant health authorities support community-based cervical cancer awareness interventions by providing appropriate educational materials, standardized health education content, and opportunities for collaboration between health facilities and community organizations. This may enhance access to accurate cervical cancer information among both women and men.

Further Research

The study recommends further research using a controlled or randomized study design and a longer follow-up period to determine whether the improvement in cervical cancer knowledge following nurse-led health education is sustained over time. Future studies should also consider larger and more diverse populations and different community settings to improve the generalizability of the findings.

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Appendix A: Permission from Nola Pender to use Health Promotion Model**Nola Pender** <npender@umich.edu>

to me ▾

Aug 2, 2020, 8:02 AM ☆ ↩ ⋮

Dear Milly:

You have my permission to use the Health Promotion Model and all related instruments in your research and in any resulting publications. I wish you success in finalizing your research and in your professional career.

Sincerely,

Nola J. Pender

Appendix B: Informed Consent Form

I am Namirembe Milly Bulwa, a Master's of Nursing Science student at Uganda Christian University, Mukono. I am carrying out a research study on “*Effect of a Nurse-Led Health Education Intervention on Knowledge of Women and Men of Cervical Cancer and Screening in Uganda*”. This study is mainly for academic purposes. The data collected will be used to generate a body of knowledge that may contribute to increase on cervical cancer screening in Uganda.

The purpose of this form is to get your informed consent to participate in the study. I am kindly requesting you to answer the questions honestly, with correct representation of your views and experience. Completion of the questionnaire will take approximately 20-30 minutes. If you choose to participate it will help me to generate data that is from participants who are fore front to fight cervical cancer in women. There is no known risk resulting from your participation in this study.

Total confidentiality will be maintained such that the information you give cannot be followed up to you. The consent forms will be corrected separately and identification numbers instead of names will be used on questionnaires to ensure there is no connection between the two.

The exercise is entirely voluntary but the researcher will provide a small token of a sanitizer for appreciation.

For your rights and research ethical concerns.

This study has been reviewed and approved by the Uganda Christian University Research Ethics Committee (UCU-REC) which is accredited by the Uganda National Council for Science and Technology (UNCST). If you have any concerns about the research or how

the research team is treating you, please contact Professor Peter Waiswa, the UCU-REC Chairperson on 0772405357, pwaiswa@musph.ac.ug or Mr. Osborn Ahimbisibwe, UCU-REC Manager on 0775737627, oahimbisibwe@ucu.ac.ug

If you agree to take part in the study, please sign here below.

I here by consent to participate in this study. I have read and understood the purpose of the study and hereby do accept to be one of the participants.

.....
Respondent's signature
Date:


.....
Researcher's signature

Appendix C: Questionnaire

Effect of a Nurse-Led Educational Intervention on Knowledge of Cervical Cancer and Screening among Women and Men in Uganda.

Date..... Questionnaire.....

Dear Participant this study is mainly for academic purposes and is seeking to identify effect of a nurse-led educational intervention on knowledge of cervical cancer and screening among women and men in Uganda. To ensure confidentiality, the questionnaire will remain anonymous. Please read the questions carefully and answer appropriately and genuinely.

Section1: Women and Men Social Demographic Characteristics. Please indicate the appropriate answer.

1. Age (Years)

2. Gender (Please tick in box) Male ☐ Female ☐

3. Marital status (please tick one)

Single ☐ Married ☐ Divorced ☐ Separated ☐ Minus one ☐

4. Level of education status (please tick one)

Primary ☐ Secondary ☐ Diploma or University ☐ No formal education ☐

5. What is your occupation? (Please indicate in box)

Housewife Student ☐ Private Employee ☐ Government Employee ☐

Section11: Women and Men’s Knowledge of Cervical Cancer and Screening.
Please tick the appropriate box.

Knowledge of Cervical cancer and screening		
Knowledge on cervical cancer	Yes	No
6.Is cervical cancer a disease? .		
7.Is a persistent unpleasant vaginal discharge a sign of cervical cancer?		
8.Is vaginal bleeding between menstrual periods a sign of cervical cancer?		
9.Is vaginal bleeding after menopause a sign of cervical cancer?		
10.Discomfort or pain during sex could be a sign of cervical cancer		
11.Vaginal bleeding during or after sex could be a sign of cervical cancer		
Knowledge on Risk factors		
	Yes	No
12.Is poor hygiene a risk for cervical cancer		
13.Having multiple sexual partners predisposes to cervical cancer		
14.Early age at marriage< 18 years predisposes to cervical cancer		
15.Un protected sexual practice before 18 year predisposes to cervical cancer		
16. Family history of cervical cancer is a risk factor for cervical cancer.	Yes	No
Knowledge on Screening for cervical cancer		

17. Have you heard about screening?		
18. Undergoing cervical cancer screening is a good practice.		
19. Screening test aims at detecting cervical cancer early		
20. It is necessary to undergo the screening test for cervical cancer		
Knowledge on Age and Frequency of screening	Yes	No
21. Women aged 20 – 30 years should go for screening every 3 years		
22. Women aged 31 – 50 years should go for screening every 3 - 5 years.		
23. Women aged 50 years and above should not be screened.		
Perceived benefits (Knowledge on the Advantages of cervical cancer screening)	Yes	No
24. Screening is meant for early detection of cervical cancer		
25. Screening allows detection of any abnormal changes in the cervix. .		
26. Early detection of cancer cells allows early treatment and full recovery		

End of questionnaire.

Thank you very much for your participation in this study.

God Bless You.

Appendix D: *Letter of Request for Permission*

**NAMIREMBE MILLY BULWA
UGANDA CHRISTIAN UNIVERSITY
P.O BOX 4
MUKONO (MAIN CAMPUS)
THE CO-ORDINATOR OF RESEARCH AND INFORMATION
NAMIREMBE DIOCESE**

Dear Sir/Madam,

RE: RESEARCH ON EFFECT OF A NURSE-LED HEALTH EDUCATION INTERVENTION ON KNOWLEDGE OF WOMEN AND MEN CERVICAL CANCER AND SCREENING, BUNAMWAYA PARISH, WAKISO DISTRICT.

I am a post graduate student at Uganda Christian University- Mukono pursuing a Master in Nursing Science. I am undertaking research on the above-mentioned topic. Information got from the study will only be used for educational purposes and will be treated with extreme confidentiality. I also affirm that the subjects used in the study will be identified using codes and no names will be used.

The purpose of this communication is to request you to carry out this study in the above-mentioned area.

Your co- operation allowing me to collect data in the above-mentioned area will be highly esteemed. The final report will be given to you to see the findings, conclusions and recommendations.

Yours

Namirembe Milly Bulwa

Appendix E: *Interventional material/Brochure*

What is cervical cancer

Cervical cancer is when normal cells in the lining of the your cervix grow abnormal way to form a swelling called a tumour.

The cervix is located at the lower of your womb (uterus). It is often called the neck of the womb and it is shaped like a cylinder or a tube which is about 2.5 cm (1 inch long).

What are the symptoms of cervical cancer ?

- Abnormal vaginal bleeding. For example , bleeding in between periods, after sexual intercourse or mafter the menopause.
- An abnormal vaginal discharge that may smell unpleasant.
- Discomfort or pain during sex, or in the pelvic area.

N.B

These symptoms are usually caused by other things, but always get them checked out.

Predisposing factors of cervical cancer

- Multiple sexual partners
- Sexual intercourse at early age
- Co-infection with sexually transmitted diseases
- Smoking
- Weakened immunity

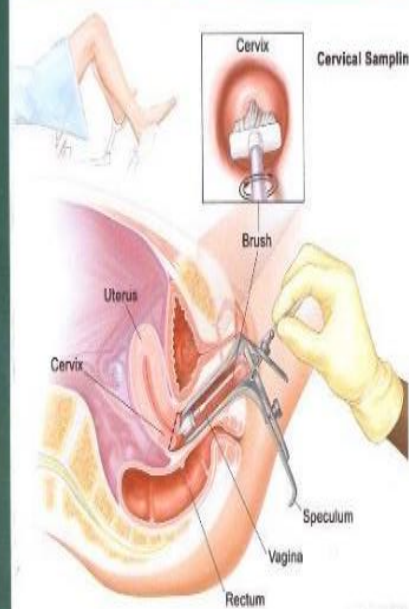
Despite the above risk factors, regular cervical screening and timely treatment of the pre-cancerous changes can prevent cervical cancer.

Benefits of cervical cancer screening

- Early detection of cervical cancer.
- Early treatment and management.
- Full recovery and healing.

Methods of prevention of cervical cancer

- Regular cervical screening is proven to be an effective way of preventing cervical cancer.
- Receive HPV vaccine before initiation of sexual activity
- Practice safer sex e.g use condoms and avoid having multiple sexual partners to reduce the chance of infection with HPV and other sexually transmitted diseases
- Do not smoke



APPENDIX F: Authority letter

NAMIREMBE MILLY BULWA
UGANDA CHRISTIAN UNIVERSITY
P.O BOX 4
MUKONO (MAIN CAMPUS)

Date 202

TO REV. ELIJAH KYOBE
IN – CHARGE OF BUNAMWAYA PARISH
NAMIREMBE DIOCESE

Dear Sir,

RESEARCH ON EFFECT OF A NURSE-LED EDUCATIONAL INTERVENTION ON KNOWLEDGE, ATTITUDE, PRACTICE OF WOMEN AND MEN IN THEIR INTENT TO UTILIZE AVAILABLE CERVICAL CANCER SCREENING, BUNAMWAYA PARISH, WAKISO DISTRICT.

I am a post graduate student at Uganda Christian University- Mukono pursuing a Master in Nursing Science. I am undertaking research on the above-mentioned topic. Information got from the study will only be used for educational purposes and will be treated with extreme confidentiality. I also affirm that the subjects used in the study will be identified using codes and no names will be used. The purpose of this communication is to request you to carry out this study in the above-mentioned areas at Seguku and Nfufu churches.

Your co- operation allowing me to collect data in the above-mentioned areas will be highly esteemed. The final report will be given to you to see the findings, conclusions and recommendations.

Yours faithfully,

Namirembe Bulwa
Namirembe Milly Bulwa (Mrs.)

C:C Lay reader Seguku Church of Uganda

C:C Lay reader Nfufu Church of Uganda



APPENDIX G: *Ethical Approval Letter*



UGANDA CHRISTIAN UNIVERSITY

A Centre of Excellence in the Heart of Africa

07/03/2023

To: Milly Namirembe

Uganda Christian University
0704831128

Type: Initial Review

Re: UCUREC-2023-456: Effect of a Nurse-Led Educational Intervention on Knowledge, Attitude, Practice of Women and Men in Their Intent to Utilize Available Cervical Cancer Screening Services in Wakiso District, 1, 2023-01-27

I am pleased to inform you that the Uganda Christian University REC, through expedited review held on **06/03/2023** approved the above referenced study.

Approval of the research is for the period of **07/03/2023** to **07/03/2024**.

As Principal Investigator of the research, you are responsible for fulfilling the following requirements of approval:

1. All co-investigators must be kept informed of the status of the research.
2. Changes, amendments, and addenda to the protocol or the consent form must be submitted to the REC for re-review and approval **prior** to the activation of the changes.
3. Reports of unanticipated problems involving risks to participants or any new information which could change the risk benefit: ratio must be submitted to the REC.
4. Only approved consent forms are to be used in the enrollment of participants. All consent forms signed by participants and/or witnesses should be retained on file. The REC may conduct audits of all study records, and consent documentation may be part of such audits.
5. Continuing review application must be submitted to the REC **eight weeks** prior to the expiration date of **07/03/2024** in order to continue the study beyond the approved period. Failure to submit a continuing review application in a timely fashion may result in suspension or termination of the study.
6. The REC application number assigned to the research should be cited in any correspondence with the REC of record.
7. You are required to register the research protocol with the Uganda National Council for Science and Technology (UNCST) for final clearance to undertake the study in Uganda.

The following is the list of all documents approved in this application by Uganda Christian University REC:

No.	Document Title	Language	Version Number	Version Date
1	Data collection tools	English	1	2023--27
2	Informed Consent forms	English	1	2023-01-27
3	Protocol	English	1	2023-01-27

Yours Sincerely

Peter Waiswa
For: Uganda Christian University REC