



COLLEGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

**KNOWLEDGE AND ATTITUDES TOWARDS CERVICAL CANCER HEALTH
EDUCATION AND COUNSELING AND ASSOCIATED FACTORS AMONG
HEALTH WORKERS IN COMMUNITY DRUG OUTLETS IN KAWEMPE DIVISION
IN KAMPALA DISTRICT; A CROSS-SECTIONAL STUDY**

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Declaration

I NAKAMANYA SHARON KITIBWAKYE, declare that this dissertation is my original work and has never been presented in any other institution of higher learning for any academic award.

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Operational definitions

Counseling: This is the process by which a health worker interacts with a client with problems related to cervical cancer, its prevention, and treatment, and guides them to adopt the best solutions including but not limited to adoption of health behaviors, cervical cancer screening, cancer treatment, HPV vaccination and/or participates in spontaneous referral of patients suspected with cervical cancer to gynecologists with written notes.

Community drug outlets – These include both drug shops and retail healthcare facilities that are headed by a pharmacist, that provide cognitive and pharmaceutical services to a specific community.

Health education – This refers to informing the public about the existence of cervical cancer, its epidemiology, its preventive mechanisms, availability of treatment, and diagnosis through use of one-on-one patient-provider communication and/or the use of information education and communication materials.

Promoting Human Papilloma Virus (HPV) vaccination – This refers to provision of information about the presence of HPV vaccine, its benefits, eligible age to receive the vaccine, and where to obtain it from.

Referral of suspected patients to gynecologists – This refers to the suggestion to an individual by one healthcare worker to seek more extensive health services from gynecologists because of the presence of early signs and symptoms of cervical cancer.

Abbreviations

APR	–	Adjusted prevalence ratios
AIC	–	Akaike Information Criterion
BIC	–	Bayesian Information Criterion
CC	–	Cervical cancer
CCHEC	–	Cervical cancer health education and counseling
CDC	–	Centre for Disease Control
CI	–	Confidence interval
DNA	–	Deoxyribonucleic acid
HIV	–	Human Immunodeficiency virus
HPM	–	Health Promotion model
HPV	–	Human Papillomavirus
MakSPH	–	Makerere University School of Public Health
Pap	–	Papanicolaou
PR	–	Prevalence ratios
REC	–	Research and Ethics Committee
UNCST	–	Uganda National Council of Science and Technology
VIA	–	Visual Acetic Acid
WHO	–	World Health Organisation

Abstract

Introduction

Cervical cancer is an increasing public health threat worldwide, especially in developing countries. It is the most common cancer among women in Uganda. Despite its high incidence, there is still a low uptake of cervical cancer screening. Increasing the uptake of screening and vaccination services requires awareness of the community about cancer, risk factors, preventive mechanisms, and the availability of such services besides their benefits. Health workers in community drug outlets are in a position to promote healthy behavior and to improve the uptake of those services because they are among the most accessed medical facilities.

Objectives

To assess the knowledge and attitudes towards cervical cancer health education and counseling, and associated factors among health workers in community drug outlets in Kawempe division in Kampala district.

Methods

A cross-sectional design was used in this study. Interviewer-administered questionnaires with information on knowledge and attitudes toward cervical cancer health education and counseling were used to collect data from health workers in community drug outlets. Descriptive statistics including mean, standard deviation, and median were used to summarize continuous data. Categorical data was summarized using frequency distribution tables and percentages. Modified Poisson regression was used to determine the association between the independent and dependent variables.

Results

A total of 410 study participants were included in this study. Of 410 study participants, 51.71% [95% CI: 46.75% – 56.64%] had good knowledge regarding cervical cancer and 38.5% [95% CI: 33.8% – 43.4%] had positive attitudes towards cervical cancer health education and counseling. The factors that were associated with good knowledge of cervical cancer included attendance of cervical cancer training (APR = 1.28, 95%CI: 1.07 – 1.54, $p = 0.008$), interaction with one or two cervical cancer patients (APR = 1.35, 95%CI: 1.10 – 1.64, $p = 0.003$), interaction with three or more cervical cancer patients (APR = 1.47, 95%CI: 1.13 – 1.97, $p = 0.005$), and seeing 41 to 60 clients in a day (APR = 1.53, 95%CI: 1.13 – 2.09, $p = 0.006$). The factors that were associated with positive attitude towards cervical cancer health education and

counseling included; working between 31 to 60 hours a week (APR = 0.47, 95% CI: 0.30 – 0.74, $p = 0.001$), having 1 or 2 clients seeking knowledge about cervical cancer (APR = 1.33, 95% CI: 1.05 – 1.69, $p = 0.019$), having 3 or more clients seeking knowledge about cervical cancer (APR = 1.74, 95% CI: 1.18 – 2.59, $p = 0.006$), and serving between 21 to 40 patients in a day (APR = 0.71, 95% CI: 0.52 – 0.96, $p = 0.028$).

Conclusion

Healthcare workers in community drug outlets ought to play a pivotal role in promoting health practices including providing health education and counseling. This study revealed that healthcare workers in community drug outlets are quite limited in knowledge regarding cervical cancer and few have positive attitudes toward cervical cancer health education and counseling. Improving knowledge and attitudes of healthcare workers in community drug outlets towards cervical cancer health education and counseling through various interventions such as revising policies on cervical cancer prevention and control stipulating vividly their role, offering guidelines in the provision of these services and the necessary trainings, and ensuring their access to various information and education materials on cervical cancer will facilitate their role in promoting cervical cancer prevention and control within their communities.

CHAPTER 1: INTRODUCTION

Introduction

Cervical cancer is an increasing public health threat worldwide, especially in developing countries (Sung et al., 2021). It is the fourth most common cancer in women with over 604000 new cases in 2020 contributing to about 342000 deaths. Approximately 90% of these deaths were from developing countries. In 2020, Asia and Africa had the highest incidence and mortality due to cervical cancer than any part of the world. In Africa, Eastern Africa contributed nearly half of the newest cases (54560 out of 117326) of cervical cancer compared to its counterparts (Sung et al., 2021). There is a steady rise in cervical cancer cases in Uganda. In 2020, cervical cancer was the first most common cancer among women. It contributed to more than a third (35.7%) of new cancers in women. It was also the leading cause of mortality due to cancer when all cancers in men and women are combined (20%) (Sung et al., 2021).

The rising incidence of cervical cancer could be due to patient-related factors such as limited awareness about cervical cancer, level of education, high prevalence of sexually transmitted diseases, and contraceptive use; and health-system-related factors such as knowledge of health workers about cervical cancer, access to quality care and cervical cancer screening, lack of functional referral systems, and availability of diagnostics (Mwaka et al., 2016). Besides, studies have shown the high prevalence of HPV infection (24%), in sub-Saharan Africa (Bruni et al., 2023). The most implicated HPV subtypes, 16 and 18 in cervical cancer are however shown to be low in these countries (Bruni et al., 2023). The prevalence of HPV infection 16/18 subtypes is on average 3.9% among women with normal cytology I Africa (Bruni et al., 2023). In spite of the low prevalence of these subtypes, these are more virulent subtypes than those in developed countries (Bruni et al., 2023)

Human Papillomavirus (HPV) vaccination and cervical cancer screening are preventive measures for cervical cancer (Sung et al., 2021). It was confirmed by a study that used Swedish demographic and health registers to follow-up on girls from 2006 to 2017, that there is about 90% cervical cancer reduction in women vaccinated against HPV before the age of 17 years (Lei et al., 2020). Cervical cancer screening is a secondary preventive measure. It includes the use of Pap smear, VIA examination, and use of HPV DNA screening tools (Nakisige et al., 2017). Early screening and diagnosis, and treatment of cervical cancer increase the 5-year survival rate of more than 90% of women (SEER, 2021). However, many women in Uganda present late to the hospitals. A single-site cross-sectional study conducted in Uganda showed

that 66% of women with cervical cancer were diagnosed late (Mwaka et al., 2016). Late presentation could be due to limited awareness of cervical cancer by the public (Adoch et al., 2020, Ndejjo et al., 2017). This, thus, calls for increased awareness about cervical cancer among health workers.

Ministry of Health developed the Strategic Plan for Cervical cancer Prevention and Control for a period from 2018 and 2023. The goals of this plan include: 100% HPV1 and HPV2 vaccination uptake by all eligible girls/women; inclusion of cervical cancer, HPV vaccination, cervical cancer screening, diagnosis and treatment of cancer lesions in primary, secondary school, and tertiary institutions curricula; increase in screening rates of pre-cancer among women aged 25-49 years from 10% to 50%, increase in treatment rates of pre cancer lesions among women ages 25–49 years by 80%, and an increase in the proportion of women with suspected cancer that are provided with diagnostic and treatment (Ministry of Health, 2018). Increasing the uptake of screening and vaccination services requires awareness of the community about cancer, risk factors, preventive mechanisms and the availability of such services besides their benefits.

Health workers in community drug outlets are in such a position to promote health behaviors and to improve the uptake of those services because they are among the most accessed medical facilities (Asiedu-Danso et al., 2020). A systematic review analysis including twelve articles showed that there is potential for health workers in community drug outlets to facilitate early diagnosis of cancer through education and screening (Lindsey et al., 2015). Six of these studies, of which one was about educating women about cervical cancer, influenced patient behavior and increased awareness and knowledge through health education, questionnaires, and the use of test kits (Lindsey et al., 2015). Community drug outlets interventions have also been seen to improve patient referrals for cervical cancer (McGuire et al., 2007).

In Uganda, a lot of emphasis has been put to continuous training of health workers within the confines of health facilities about cervical cancer (Ministry of Health, 2018) and minimum efforts have been put in training health workers in community drug outlets. Yet for effective patient management, community drug outlets and other healthcare facilities need to be viewed all along the continuum of care of patients. To effectively engage in cervical cancer health education and counseling including raising awareness about cervical cancer, education about cervical cancer and its risk factors, promoting HPV vaccination and screening, raise awareness about treatment and benefits of cervical cancer treatment, and referral of suspicious patients to

gynecologists, health workers in community drug outlets should have adequate knowledge about cervical cancer. The knowledge includes; the definition, causes, risk factors, preventive mechanisms, screening, and treatment. They should also have positive attitudes towards cervical cancer (Koskan et al., 2021). These knowledge gaps may have limited community drug outlets' participation in cervical cancer health education and counseling.

In Uganda, little is known about the knowledge and attitudes of health workers in community drug outlets towards cervical cancer health education and counseling. This study was therefore conducted to assess the knowledge and attitude of healthcare workers in community drug outlets towards cervical cancer health education and counseling and associated factors in Kawempe division in Kampala district. This information will be used by policy makers to design interventions, including but not limited to health worker training and support that will help improve their knowledge, competence, motivation and attitudes towards cervical cancer health education and counseling.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Equitable access to cervical cancer prevention and control services requires the involvement of all key stakeholders to ensure success of these interventions. In the healthcare sector, it requires involvement of trained healthcare workers in all spaces starting from community health workers, to health workers in the public sector and those in the private sector including hospitals, health centers, clinics, pharmacies, and drug shops (Aguado et al., 2007). Disease prevention and control in the healthcare sector involves interventions that minimize burdens of diseases and its associated risk factors (WHO, 2023). Healthcare workers need to raise awareness of cervical cancer and also promote health behaviours in the population through a variety of methods such as one-on-one patient communication, one-to-many client communication (mass sensitization), information and communication materials, and media campaigns among others (Aguado et al., 2007, MoH, 2010). Nevertheless, healthcare workers also provide information about cervical cancer signs and symptoms, risk factors, and prevention to stimulate behaviour change and/or facilitate early detection of cervical cancer (Aguado et al., 2007).

The main risk factors for cervical cancer include; HPV infection, having multiple sexual partners, early age at first sex, smoking tobacco, Human Immunodeficiency virus (HIV) infection, having other sexually transmitted diseases for example Chlamydia infection, and long term use of oral contraceptives (American Cancer Society, 2020). Education of individuals may include information such as quitting smoking; promoting healthy diets – ensuring a diet high in fruits and vegetables; encouraging consistent and correct condom use; encouraging HPV vaccination for young girls between 9 and 13 years and screening of women who are 25 years and above among others (American Cancer Society, 2020, Ministry of Health, 2018). Besides, health workers may screen and/or refer patients with warning signs and symptoms (Aguado et al., 2007) such as postcoital bleeding, excessive vaginal discharge, and persistent sexually transmitted infections for early detection of cervical cancer (American Cancer Society, 2020). Available literature provides information on knowledge, attitude, and associated factors among health workers towards cervical cancer prevention and control. However, there is no accessible literature about cervical cancer health education and counseling among health workers in community drug outlets.

2.2 Knowledge about cervical cancer, its prevention and management

2.2.1 Proportion of health workers with good knowledge about cervical cancer, its prevention, and management

A multicenter cross-sectional study conducted in rural areas in Northern Uganda, assessing the knowledge of health workers with regards to cervical cancer showed that 171 out of 286 (60%) had adequate knowledge about cervical cancer with a cut score of 18 out of 25 points. The main sources of information on cervical cancer were media (35%), current job training (51%), in service training (8%), and colleagues at work (4%) among others. The main reported risk factors included, having multiple sexual partners (99%), tobacco smoking (42%), long term use of contraceptives (23%), and infections with *Chlamydia trachomatis* (50%). The most identified sign of cervical cancer was bleeding after sexual intercourse (93%). Study participants reported early screening (97%), avoidance of prolonged use of oral contraceptive pills (28%) and abstinence from tobacco use (47%) as the main ways to prevent cervical cancer (Obol et al., 2021).

A cross-sectional study conducted in India assessing knowledge of community health workers with regards to cervical cancer and its screening among 290 health workers found that less than a quarter of the study participants had adequate knowledge in this area (21.4%) (Khanna et al., 2019).

A cross-sectional study conducted in Somalia among 280 health professionals assessing for knowledge of health workers about cervical cancer showed that overall, 63.46% of the healthcare professionals had adequate knowledge. Nevertheless, 68.83% of these had adequate general knowledge on cervical cancer, 60.66% had adequate knowledge on cervical cancer risk factors, 57% had adequate knowledge on cervical cancer screening, and 69.6% had adequate knowledge about HPV. The most common signs for cervical cancer included intermenstrual bleeding (43.9%), increased vaginal discharge and color changes (39.6%), bleeding and pain after sexual intercourse (67.9%), postmenopausal bleeding (59.3%). The most reported risk factors for cervical cancer included early age at first sex (39.6%), practicing polygamy (50.7%), having sexually transmitted diseases (67.1%), having three or more children (51.1%), having HPV infection (58.2%), long term use of oral contraceptives (37.5%). Approximately thirty-one percent (31.4%) were unaware of vaccination against HPV. Diagnosis of cervical cancer was known to be done through use of a Pap smear by 62.9%. Majority felt like diagnosis with a Pap smear and/or HPV testing should only be conducted in case of gynecological complaints (44.7%) though reported that it's necessary for protection from cervical cancer (53.3%). Only

69.3% were knowledgeable of the fact that HPV is sexually transmitted. Cervical cancer knowledge scores were found to be statistically different among participants of different professions ($p < 0.001$) with higher knowledge among the doctors (Altunkurek et al., 2022).

A cross-sectional study carried out in Turkey examining the level of knowledge about cervical cancer risk factors among 261 women healthcare workers showed that 208 (79.7%) knew that having more than one sexual partner increases risk for cervical cancer, 203 (77.8%) knew that HPV is a major risk cause of cervical cancer, 201 (77%) knew that smoking is a risk factor for cervical cancer, early age at first sex increases the risk of cervical cancer, and 204 (78.2%) knew that cervical cancer is preventable. Nevertheless, 87.4% of the study participants reported that they had about a Pap smear (Coskun et al., 2013).

A cross-sectional study conducted in Van, Turkey among 194 women in primary healthcare facilities showed that 94.9% of these knew that Pap smear is indicated for cervical cancer screening, 30.1% knew that indicated for women who are 30 years and above, 5.4% knew that its conducted every three years, 89.0% knew that having more than one sexual partner increases the risk of cervical cancer, 72.0% knew that early age at first sexual intercourse increases risk for cervical cancer, 84% knew that smoking increases the risk of cervical cancer, 79.0% knew that there are preventable methods including vaccination for cervical cancer (Atila et al., 2019).

A multicenter cross-sectional study carried out in Addis Ababa, Ethiopia among 333 healthcare workers assessing their knowledge about cervical cancer showed that 81% of the respondents recognized that cervical cancer was a major cause of morbidity and mortality among women in their country. Majority of these respondents believed that cervical cancer was preventable (85%) and that it can be detected at a precancerous stage (87%). Majority also knew that cervical cancer screening is useful in detecting precancerous lesions (91%). Also, 156 out of 333 (47%) respondents correctly identified the four cervical cancer risk factors. More than two-thirds (70%) of the doctors but less than half of nurses and midwives (36%) and medical students (48%) correctly identified the risk factors. Majority of the study participants were aware of the Pap smear (92%) but 51% had heard of visual inspection with acetic acid (Kress et al., 2015).

A multicenter cross-sectional study conducted in Burundi assessing knowledge about cervical cancer among 131 health workers indicated that 76.3% had adequate knowledge about cervical cancer (score $> 70\%$). Overall, 68.7% had adequate knowledge about cervical cancer and its risk factors. The main reported risk factors included; early age at first sexual intercourse (90%),

having many sexual partners (90%), infection with HPV (90%), high parity (50.4%), and smoking (49.6%). Eighty nine percent (89%) of the study participants knew that HPV is the main cause of cervical cancer. Less than a fifth (14.5%) of the study participants knew the main serotypes of HPV associated with cervical cancer. In regards to knowledge about cervical cancer prevention, only 8.7% of the study participants had adequate knowledge (scored above 70%). Only 0.8% and 13.7% of the study participants had adequate knowledge about vaccination and screening respectively. More than half (55%) of the study participants knew that HPV vaccination prevents women from developing cervical cancer. In regards to knowledge about screening, less than a fifth of the study participants (15.3%) knew that VIA is a method for screening while 82% knew about HPV screening tests. Less than half (48.1%) knew about cryotherapy as a method of treating precancerous lesions. Only 10.7% knew the target age group for HPV vaccination and 3.1% knew the required schedules for HPV vaccination (Ndizeye et al., 2018).

A multicenter study conducted in Cote d'Ivoire among 695 midwives assessing their knowledge about cervical cancer showed that 359 (55.7%) midwives had adequate knowledge including its epidemiology, risk factors, and symptoms. Almost all (99%) knew that cervical cancer is the commonest cancer among women. Majority reported risk factors of multiple sexual partners (85.5%), early age at first sexual intercourse (80.1%), and infection with HPV (69.1%). Approximately three-quarters of the respondents (76.4%) identified bleeding after sexual intercourse as sign of cervical cancer. In regard to knowledge about prevention of cervical cancer, 42.4% had adequate knowledge. Even though 90% of midwives knew that cervical cancer is preventable, nearly two-thirds (71.1%) knew that screening is used as a preventive method for cervical cancer. Midwives identified Pap smear (88.7%), HPV test (53.9%) and visual inspection methods (49.7%) as the screening methods for cervical cancer. Approximately half (50.3%) of the midwives were aware of HPV vaccine and of its protection from cervical cancer. Furthermore, only 43.8% knew about when the vaccine needs to be administered (Tchounga et al., 2014).

A single-centre cross-sectional study conducted in Saudi Arabia among 395 female health workers showed that only 8.9% knew that having multiple sexual partners is a risk factor for cervical cancer and 8.6% of the study participants knew the age at which women are at risk of cervical cancer. In addition, only 7% recognized vaginal bleeding, 8% recognized vaginal discharge, and 13% recognized contact bleeding as signs for advanced stages of cancer. Also, only 10% were aware of behaviors for prevention of cervical cancer. More than three-quarters

of the study participants (86.8%) also believed that Pap smear test is a useful test for detection of cervical cancer (Heena et al., 2019)

2.2.2 Factors associated with knowledge about cervical cancer

A cross-sectional study conducted in Van, Turkey among 194 women in primary healthcare facilities to assess for knowledge about cervical cancer showed that women who had attained higher levels of education had significantly higher knowledge scores than those who attained lower education ($Z = 3.21$, $p = 0.001$). Married study participants reportedly had higher knowledge scores than singles ($Z = 2.89$, $p = 0.004$). Nevertheless, study participants who had ever had a Pap smear had significantly higher knowledge scores than those who had not undergone Pap smear tests ($Z = 2.85$, $p = 0.004$). However, regularity of an individual's menstruation was not statistically associated with knowledge. Cervical cancer knowledge score were significantly higher than those of other health workers, nurses and midwives inclusive ($p < 0.05$) (Atila et al., 2019).

A multicenter cross-sectional study carried out in Addis Ababa, Ethiopia among 333 healthcare workers assessing knowledge about cervical cancer showed that differences in knowledge about cervical cancer risk factors were statistically significant across the profession of doctors, nurses and midwives, and students ($p < 0.001$). Knowledge about VIA technique was significantly higher among doctors as compared to doctors, midwives and nurses ($p < 0.001$). Knowledge about the vaccine was also found to be significantly lower among nurses and midwives than medical students but higher among doctors ($p < 0.001$) (Kress et al., 2015).

A multicenter cross-sectional study conducted in Burundi assessing knowledge about cervical cancer among 131 health workers indicated that healthcare workers who had one year or less of experience has significantly higher knowledge scores about cervical cancer than those who had more than one year of experience ($p = 0.038$). However practice of cervical cancer prevention was not significantly associated with knowledge about cervical cancer and its prevention ($p = 0.18$ and $p = 0.14$ respectively) (Ndizeye et al., 2018).

A multicenter study conducted in Cote d'Ivoire among 695 midwives assessing the factors associated with knowledge about cervical cancer showed that having a long professional experience was significantly associated with appropriate knowledge on cervical cancer disease (aOR = 5.0; 95% CI [2.9-8.7]; $p = 0.01$) and on cervical cancer prevention (aOR = 2.2; 95% CI [1.3-3.6]; $p = 0.01$). Having attended conferences and special training sessions on cervical cancer were significantly associated with knowledge about cervical cancer prevention

(aOR = 1.78; 95% CI [1.1 - 3.0]; $p = 0.03$ and aOR = 4.9; 95% CI [1.9 - 12.7]; $p < 0.01$ respectively). However, age of midwives (aOR = 1.74; 95% CI [0.74-4.01]; $p = 0.19$), employment status (aOR = 0.93; 95% CI [0.19-4.50]; $p = 0.93$) and type of health facility (aOR = 1.30; 95% CI [0.85-2.13]; $p = 0.25$) were not associated with appropriate knowledge on prevention of cervical cancer (Tchounga et al., 2014).

A multicenter cross-sectional study conducted in rural areas in Northern Uganda, assessing the knowledge of health workers with regards to cervical cancer showed that study participants who had not received training were 61% less likely to have an adequate knowledge score (AOR = 0.39, 95% CI 0.21 – 0.72, $p < 0.001$) when controlling for other variables. However, there was no statistically significant difference between the knowledge score of nurses and clinical officers (AOR = 0.98, 95% CI 0.46 – 1.67, $p = 0.69$) and nurses and midwives (AOR = 1.15, 95% CI 0.56 – 1.68, $p = 0.91$) when controlling for other variables. Furthermore, gender, health center level, number of years of working, age, and presence of educational materials about cervical cancer were not associated with adequate knowledge scores (Obol et al., 2021).

2.3 Attitude towards cervical cancer prevention and control

2.3.1 Proportion of health workers with positive attitudes towards cervical cancer prevention and control

A cross-sectional study conducted in India assessing attitude of community health workers towards cervical cancer screening among 290 health workers found that almost all (93.9%) had a positive attitude towards cervical cancer screening. More than three-quarters of study participants (80.1%) recognized that cervical cancer is one of the diseases of public health importance among women. Approximately two-thirds (66.8%) of these were aware that any woman can develop cervical cancer. Approximately three-quarters (74.4%) believed that all married women (30 – 65 years) needed to undergo cervical cancer screening. More than two-thirds (69.7%) expressed the importance of screening to aid in early detection and prognosis. However, 59.6% of the study participants said that screening procedure may be painful (Khanna et al., 2019).

A multicenter cross-sectional study carried out in Addis Ababa, Ethiopia among 333 healthcare workers assessing their attitude towards cervical cancer and its screening showed that 98% perceived cervical cancer as a serious disease and 97% agreed to its necessity in management of women in healthcare. In this study, 89% of the study participants expressed the need for starting up a screening program in the community. However, the reported perceived barriers

towards cervical cancer screening included inadequate training in regards to screening individuals (52%), lack of equipment and supplies (53%), lack of laboratory resources (41%), expense to patients (42%), inability to follow-up with patients (37%), and more pressing health problems of patients (37%), patient dislike and refusal (15%), difficulty of screening (19%), and health care provider time constraints (15%) (Kress et al., 2015).

A multicenter cross-sectional study carried out among 286 health workers in Northern Uganda showed that 66% of the health workers had positive attitude (score of > 55 out of 65) towards cervical cancer prevention. About 88% of the respondents strongly agreed about HPV vaccination of their relatives. More than two-thirds (70%) of the study participants were willing to attend a training on cervical cancer prevention. Besides 90% of the study participants also disagreed that cervical cancer is not a serious problem to require screening. Approximately three-quarters (75%) of the respondents were willing to participate in screening women if trained and necessary equipment provided (Obol et al., 2021).

A cross-sectional study among 27 health workers in Haiti showed that 52.4% were willing to do visual screenings of their patients and 100% agreed that cervical cancer screening programs should be started in their community. A quarter (25%) of those who had worked less than one year, 57.1% of those who had worked for 1–4 years, and 50% of those who had worked more than 10 years agreed that it was too difficult to screen. Among the study participants who did not feel screening was too difficult 42.9% felt it was too expensive to screen (Zahedi et al., 2014).

A cross-sectional study carried out in two health institutions in Nairobi among 114 nurses showed that 100% of the respondents agreed that cervical cancer screening is important for early detection and prevention of the disease. Less than a half (43%) of the study participants agreed that all sexually active women irrespective of the age group should be screened for cervical cancer. Less than a quarter (19%) of the study participants agreed that females below child-bearing age should also be screened for early detection. On the other hand, 38% agreed that screening should be for women of child bearing age and post-menopausal women because they are more at risk. Nevertheless, 98% of the respondents showed positive attitudes towards recommendations for HPV vaccine (Kieti, 2016).

2.3.2 Factors associated with positive attitude towards cervical cancer prevention and control

A multicenter cross-sectional study carried out in Addis Ababa, Ethiopia among 333 healthcare workers assessing attitude towards cervical cancer and its screening showed that dislike and patient refusal as a barrier to cervical cancer screening was three times higher in medical students compared to other provider types including nurses and midwives and doctors ($p = 0.016$) (Kress et al., 2015).

A multicenter cross-sectional study conducted in Cote d'Ivoire among 695 midwives assessing their attitude towards cervical cancer screening showed that health workers who had screened for cervical cancer were most likely to recommend screening to their patients (OR = 5.9%; CI: 3.7 – 9.2, $p < 0.01$) (Tchounga et al., 2014).

A multicenter cross-sectional study carried out among 286 health workers in Northern Uganda showed that individuals who had not received training about cervical cancer screening were 48% less likely to have positive attitudes towards cervical cancer prevention (AOR = 0.52, 95% CI: 0.28–0.97, p -value = 0.04). However, there was no association between having a positive attitudes and health workers qualification ($X^2 = 3.16$, p -value = 0.206). Furthermore, gender, health center level, number of years of working, age, and presence of educational materials about cervical cancer were not associated with positive attitude (Obol et al., 2021).

CHAPTER 3: PROBLEM STATEMENT, JUSTIFICATION, AND CONCEPTUAL FRAMEWORK

3.0 Problem statement

The incidence of cervical cancer is higher-than-expected in Kawempe division (standardized incidence ratio of 1.301 to 1.573) (Beyer et al., 2022). Despite this, there are low practices of cervical cancer screening among women of 30 to 49 years. By 2019, 10% of the women had ever screened for cervical cancer and only 8% had screened in the last five years in Uganda (ICO/IARC Information Centre on HPV and Cancer, 2023). Furthermore, by 2021, only forty four percent of the girls had received their second dose of HPV vaccine in Uganda (ICO/IARC Information Centre on HPV and Cancer, 2023). The low uptake of cervical cancer screening consequently results into presentation to the health facilities with advanced stages of cervical cancer (Dunyo et al., 2018) which is also associated with a low 5-year survival rate (SEER, 2021). Low HPV vaccination on the other hand results into a higher incidence of cervical cancer given a higher virulence of cervical cancer-associated HPV serotypes in non-Europeans (Freitas et al., 2014).

The low cervical cancer screening rates have been attributed to low perceived risk of cervical cancer, low levels of knowledge about cervical cancer and its screening among women, and limited discussion about cervical cancer screening of healthcare providers with the women (Isabirye et al., 2020, Twinomujuni et al., 2015, Nakisige et al., 2020). The low HPV vaccine completion rates have been linked to limited information about HPV infection and vaccination, unclear information from healthcare workers, fears of vaccine's effect on sexual behavior, low perceived risk of HPV infection, social influences and irregular preventive care among adolescents (Patrick et al., 2022).

To head off the low cervical cancer screening rates and low HPV vaccination, the Ministry of Health developed the Strategic Plan for Cervical cancer Prevention and Control between 2018 and 2023. The goals of this plan include: 100% HPV1 and HPV2 vaccination uptake by all eligible girls/women; inclusion of cervical cancer, HPV vaccination, cervical cancer screening, diagnosis and treatment of cancer lesions in primary, secondary school, and tertiary institutions curricula; increase in screening rates of pre-cancer among women aged 25-49 years from 10% to 50%, increase in treatment rates of pre cancer lesions among women ages 25-49 years by 80%, and an increase in the proportion of women with suspected cancer that are provided with diagnostic and treatment (Ministry of Health, 2018). To achieve this goal, several interventions have been designed including training of health workers in health facilities about cervical

cancer and its screening, education of women about cervical cancer and its prevention through village health teams and outreaches, and education of girls in schools all pioneered by Uganda Cancer Institute and other partner organisations.

Despite the above interventions, the low screening rates and HPV vaccination persist besides presentation of many patients to health facilities with advanced stages of cervical cancer. The interventions have contributed to the awareness and increasing knowledge about cervical cancer prevention and control in the population but however being one-off events, have contributed less verbal persuasion towards uptake of the cervical cancer prevention services. This therefore indicates the need to increase awareness about all aspects of cervical cancer in the general population to enhance self-perceived risk and through verbal persuasion, encourage women to take control of their health.

Health workers in community drug outlets in communities on the other hand may offer knowledge about cervical cancer, its prevention, and control to people in their communities and apply verbal persuasion to enhance the practices of good cervical cancer control in this population. However, offering cervical cancer health education and counseling depends on their knowledge regarding cervical cancer and attitudes of the health workers in community drug outlets towards cervical cancer health education and counseling. Little is known about the knowledge and attitudes towards cervical cancer health education and counseling among health workers in community drug outlets as available literature has only focused on obtaining knowledge, attitudes, and practices of health workers in the health facilities about cervical cancer prevention and control (Mutyaaba et al., 2006, Obol et al., 2021). This study therefore aims to identify key gaps in knowledge and attitude of health workers in community drug outlets regarding cervical cancer health education and counseling. The findings will be used by policy makers to develop interventions such as trainings, guidelines, incentives, among others in order to improve the knowledge and attitudes of health workers in community drug outlets towards cervical cancer health education and counseling. These policies may therefore improve equity in access to information about cervical cancer and contribute to the success of the gals in Uganda Cancer Strategic plan.

3.1 Justification

Obtaining information about knowledge and attitudes towards cervical cancer health education and counseling about health workers in community drug outlets will aid in obtaining gaps in this area to allow for the design of interventions, including but not limited to health worker training and support that will help improve their knowledge, competence, motivation and attitudes towards cervical cancer health education and counseling. This is because community drug outlets are one of the most accessible outlets where people seek care for management of several illnesses and diseases. They are also strategically located within the community and this improves the contact of health workers with the community and is associated with verbal persuasion. Women can therefore, easily be harnessed at this point instead of them waiting to go to antenatal clinics and gynecologists. Improved knowledge, competence, motivation and attitudes towards cervical cancer health education and counseling will in turn strengthen different community initiatives directed towards cervical cancer prevention and control as it will encourage people in their communities to gain more responsibility over their own health, actively participate in decision making in events concerning their health, and use public resources and services adequately when warranted. This also results into a more substantial and lasting impact on health.

Since there is hardly any literature published about cervical cancer health education and counseling in community drug outlets, the information obtained from this study will serve as a baseline to the different interventions about cervical cancer prevention and control developed and implemented in community drug outlets with an aim of increasing knowledge and attitude of health workers.

Information from this study will enable the identification of obstacles in adoption of the current policies on cervical cancer prevention and control for health workers in community drug outlets and thereby facilitate policy makers to design new and/or modify policies encompassing nature of work of healthcare workers working in the space of community drug outlets that will aid in strengthening the health system and improve community health.

3.2 A conceptual framework.

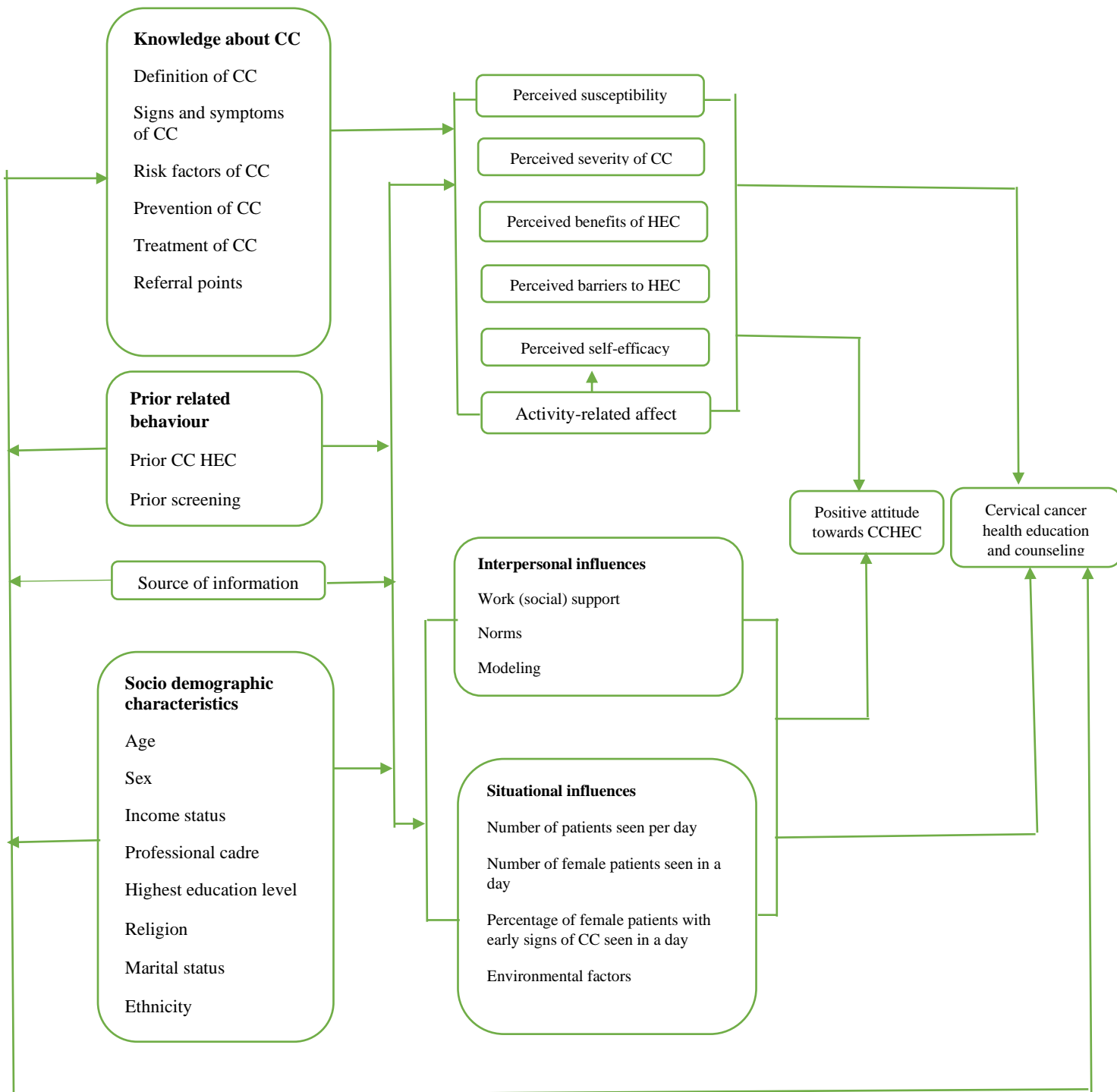


Figure 1. Conceptual framework on knowledge, attitudes, and associated factors towards cervical cancer health education and counseling among health workers in community drug outlets in Kawempe division in Kampala district

CC represents cervical cancer and CCHEC represents cervical cancer health education and counseling

Adapted from the health promotion model in by Gonzalo (Gonzalo, 2021)

The conceptual framework was adapted from the health promotion model (HPM) (Gonzalo, 2021). The health promotion model is a behaviour-oriented model that seeks to provide factors that influence health behaviours. In this case it was adopted to show us the different factors that affect the attitudes towards cervical cancer health education and counseling. In the above conceptual framework, the framework is divided into three main parts which include the social demographic and experience variables, behavioral-specific knowledge and effect variables, and the positive attitude to cervical cancer health education and counseling.

The socio-demographic and prior experience variables may directly influence an individual's attitude towards cervical cancer health education and counseling. However, these may also influence knowledge about cervical cancer and its prevention, interpersonal factors, situational factors, perceived severity of cervical cancer, perceived benefits and barriers to cervical cancer health education and counseling, and perceived severity of cervical cancer thereby indirectly influencing a health worker's attitude and practice towards cervical cancer health education and counseling.

The behavioral-specific knowledge and effect variables include; awareness and knowledge about cervical cancer and its prevention, perceived severity, perceived benefits and barriers of cervical cancer health education and counseling, self-efficacy in regards to cervical cancer health education and counseling, activity related affect, situational influences, and interpersonal influences. Most of these variables can be improved. These variables directly affect the attitude of a health worker towards cervical cancer health education and counseling.

The social demographic and experience variables and behavioral-specific knowledge and effect variables influence a health worker's attitude (proximal outcome and the outcome in this study) towards cervical cancer health education and counseling. Nevertheless, all variables, may either directly affect or indirectly affect cervical cancer health education and counseling in community drug outlets.

Interpersonal influences were not considered in this study because of limited practices of cervical cancer health education and counseling among health workers in community drug outlets.

3.3 Research questions

- 1) What is the proportion of health workers in community drug outlets in Kawempe division, Kampala with good level of knowledge of cervical cancer, its prevention, and management?
- 2) What is the proportion of health workers in community drug outlets in Kawempe division, Kampala with positive attitudes towards cervical cancer health education and counseling?
- 3) What are the factors associated with good level of knowledge of cervical cancer, its prevention, and management among health workers in community drug outlets in Kawempe division in Kampala district?
- 4) What are the factors associated with positive attitudes towards cervical cancer health education and counseling among health workers in community drug outlets in Kawempe division in Kampala district?

CHAPTER 4: RESEARCH OBJECTIVES

4.0 General objective

To assess the knowledge and attitudes towards cervical cancer health education and counseling and associated factors among health workers in community drug outlets in Kawempe division in Kampala district.

4.1 Specific objectives

1. To determine the proportion of health workers in community drug outlets in Kawempe division, Kampala with good level of knowledge of cervical cancer, its prevention, and management.
2. To determine the proportion of health workers in community drug outlets in Kawempe division, Kampala with positive attitudes towards cervical cancer health education and counseling.
3. To determine the factors associated with good level of knowledge of cervical cancer, its prevention, and management among health workers in community drug outlets in Kawempe division in Kampala district.
4. To determine the factors associated with positive attitudes towards cervical cancer health education and counseling among health workers in community drug outlets in Kawempe division in Kampala district.

CHAPTER 5: METHODOLOGY

5.0 Study site

Kawempe division is one of the divisions in Kampala city besides Nakawa, Central, Makindye and Lubaga divisions. Its GPS coordinates are 00 23N, 32 33E , latitude: 0.3385°N and longitude: 32.6258°E and covers about 30.9km² (UBOS, 2019, Latitude, 2023). It has 19 wards and 771 villages. In 2014, it had 338,665 people including 179,897 women and 158,768 men (UBOS, 2014). Kawempe was purposively chosen because of the high incidence of cervical cancer in this division as compared to other divisions of Kampala (standardized incidence ratio between 1.301 – 1.573) (Beyer et al., 2022). As of December 2022, Kawempe division had about 135 licensed retail pharmacies and 45 licensed drug shops (National Drug Authority, 2022). On average, there are three healthcare workers per retail pharmacy implying that there are 405 healthcare workers in retail pharmacies. However on average, there is 1 healthcare worker per drug shop (USAID, 2016).

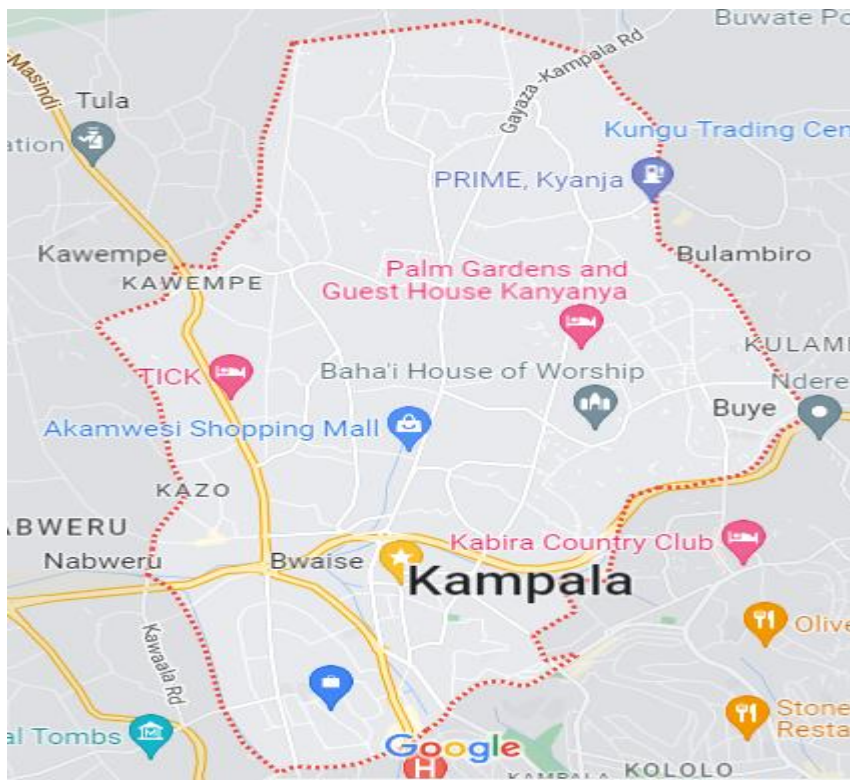


Figure 2. A map showing Kawempe division

Source: googlemaps 2022

5.1 Study design

A cross-sectional study design employing quantitative methods was used in this study. An interviewer administered questionnaire was used to collect data.

5.2 Study population

The study population were health workers including pharmacists (supervisors), and dispensers (pharmacy technicians and nurses) working in community drug outlets in Kawempe division in Kampala district involved in patient management. These were requested to show a copy of their professional licenses to ascertain that they are involved in patient management.

5.3 Eligibility criteria

5.3.1 Inclusion criteria

- Community drug outlets in Kawempe division with premises licenses given by National Drug Authority.
- Health workers including pharmacists, pharmacy technicians, and nurses working in community drug outlets in Kawempe division in Kampala district that are involved in patient management. These were requested to show a copy of their professional licenses to ascertain that they are involved in patient management.
- Health workers including pharmacists, pharmacy technicians, and nurses 18 years and above.

5.3.2 Exclusion criteria

- Health workers who failed to show a copy of their professional licenses.

5.4 Sample size consideration

Knowledge about cervical cancer is a categorical variable. Therefore, Kish Leslie's method for calculation of sample size is used.

Using; $n = [(Z^2PQ)/\delta^2]$ (Leslie, 1964)

Where $z = 1.96$ (the standard normal deviate at 95% CI)

$P =$ Estimated prevalence of healthcare professionals in community drug outlets with adequate knowledge about cervical cancer. Considering a study conducted among health workers in rural health centers in Uganda $P=60\%$ (Obol et al., 2021)

$Q = 100\% - P = 100\% - 60\% = 40\%$

$\delta =$ maximum error to be allowed = 5%

$n = [1.96^2 * 60 * 40] / 5^2 = 368.8 = 369$ study participants.

The minimum number of healthcare workers that was to be interviewed was 369 study participants.

Adjusting for non-response rate, assuming non-response rate will be 10%

Sample size = $n / (1 - \text{non-response rate})$. Where n is the effective sample size

Sample size = $369 / (1 - 10\%) = 410$ healthcare workers.

Therefore 410 healthcare workers were to be interviewed after adjusting for non-response.

5.5 Sampling procedures

A list of drug shops and pharmacies was generated from the National Drug Authority's register's portal and it included 135 licensed retail pharmacies and 45 licensed drug shops (National Drug Authority, 2022). However, when reviewing the list, re-known pharmacies were missing on the list. The principal investigator therefore did a prior search for the number of pharmacies and drug shops in Kawempe division by moving through the region. It was discovered that there were 62 licensed drug shops and 148 licensed retail pharmacies. With prior literature (USAID, 2016) on average drug shops employ 1 health worker and retail pharmacies employ 3 people, purposive sampling was used to select all drug shops and 1 health worker therein. Retail pharmacies were also consecutively sampled and health workers therein. Consecutive sampling involved going from one pharmacy to the other and from one health worker to another requesting them to participate in the interview until the minimum sample size was achieved. Consecutive sampling was chosen because a relatively large sample size of the population was to be used and this has showed to give valid and accurate statistics (Bujang and Sapri, 2018).

5.6 Variables

5.6.1 Independent variables

- Socio-demographic characteristics including; age, gender, professional cadre, highest education level attained, training institution where the highest level of education was attained, religion, marital status, tribe.
- Prior related behavior including; training in cervical cancer, having interacted with cervical cancer patients, and prior cervical cancer screening.
- Situational influences including; drug outlet type, years of working in a community drug outlet, average number of patients interacted with per day, average number of female patients interacted with per day, average number of hours worked per week.

- Source of information

5.6.2 Dependent variables

- Knowledge of health workers about cervical cancer and its prevention
- Attitude toward cervical cancer health education and counseling

5.7 Data collection tool

The study tool was adopted from previous similar studies (Shawahna and Awawdeh, 2021, Obol et al., 2021). The questionnaire includes six sections.

The first section includes socio-demographic characteristics including age, gender, marital status, qualification, highest education level attained, tribe, religion.

The second section includes work; Community drug outlet type, years of practice, average number of working hours per week, average number of female patients interacted with per day, average number of patients interacted with per day, and having worked in a health facility.

The third section includes sources of information about cervical cancer such as having heard of cervical cancer, from where they heard cervical cancer for the first time, whether the respondent has attended any training on cervical cancer, and when they last had a training in cervical cancer.

The fourth section includes prior-related behaviour such as having heard any client seeking knowledge about cervical cancer, having interacted with a patient with cervical cancer, and having participated in cervical cancer screening for women.

The fifth section includes a 38-item knowledge questions regarding prevalence, risk factors, signs and symptoms, screening methods, treatment of cervical cancer, and referral points. These questions are to be accorded either a yes, no, or I don't know response.

The sixth section of the questionnaire includes 15-item questions assessing for attitude of the respondents with regard to cervical cancer health education and counseling. These questions are to be accorded either strongly disagree, disagree, neutral, agree, or strongly disagree.

Kobo enteko web forms were used for this data collection.

5.8 Quality control

The study tool was pilot tested on 20 healthcare workers working in community drug outlets in Lubaga division to ascertain the feasibility of the study and design of the structured

questionnaires. It was ascertained that it was feasible to conduct the study and that the questionnaire was well structured.

Furthermore, a Cronbach's alpha was computed at this stage to know the internal consistency of items. The tool was found to have internal consistency as the knowledge items had a Cronbach's alpha of 0.84 and the attitude items had a Cronbach's alpha of 0.70. However, following data collection among healthcare workers in Kawempe division, the knowledge items had a Cronbach's alpha of 0.80 and attitude items had a Cronbach's alpha of 0.87. Therefore, the items consistently measured the above characteristics in this study population.

Three research assistants experienced in conducting medical research and with certification in good clinical guidelines and human subject protection were trained for one day before conducting research.

5.9 Data collection procedures

Data were collected between May and June 2023. In this research, research assistants approached managers of community drug outlets, explained to them the details of the study and these then gave permission to the research assistants to interact with their healthcare workers. Healthcare professionals were then approached, explained to purpose and benefits of the study, and consented by signing on the consent form. The research assistants then conducted the study using interviewer-administered structured questionnaires. This ensured that all questionnaires were filled to completeness and the study participants did not discuss answers amongst themselves. Upon healthcare workers finishing, the research assistants checked the questionnaires for completeness before leaving that particular study participant. Any mistakes were rectified. Finally, study participants were thanked for participation.

5.10 Data analysis

All data was transferred from Kobo toolbox data server to Microsoft Excel 2013. The data was cleaned and validated. The data was then coded using the pre-defined codes and then exported to Stata version 14. Descriptive statistics including mean and standard deviation was used to summarize continuous normally distributed data. For data which wasn't normally distributed, median and interquartile ranges have been used to summarize this. Categorical data was summarized using frequency distribution tables and percentages.

Knowledge was assessed by awarding 1 point for a correct answer, 0 points for both a wrong answer and "I don't know" responses. "I don't know" response was included to minimize guessing of the respondents. The scores for each question of a particular respondent were added

up to get their total scores. The minimum score was to be 0 and the maximum score 38. The mean score was obtained from all the scores of the study participants and it was 25.1. Because there is no established cut-off demonstrating good level of knowledge, this study accorded good knowledge to individuals who obtained a score equal to and above the mean score in the 38-item knowledge questions and poor knowledge for respondents with scores below the mean score. This has been used in previous studies of similar settings for good knowledge in cervical cancer prevention (Obol et al., 2021, Tekle et al., 2020). Attitude of respondents was assessed by according a 1 for strongly disagree, 2 for disagree, 3 for neutral, 4 for agree, and 5 for strongly agree. The respondents' scores was summed up and mean obtained. The mean score in this study was 61. Respondents who scored equal to and above the mean were termed as having positive attitude and those with scores below the mean were termed as having a negative attitude. However, these cut-offs were not based on any established standards but rather their use in portraying attitude towards cervical cancer health education and counseling activities as demonstrated in previous studies (Obol et al., 2021, Tekle et al., 2020). Prevalence of good knowledge and positive attitudes were both expressed using frequencies and percentages.

Continuous variables were categorized before carrying out bivariate analysis. Bivariate analysis was conducted using chi square and bivariate modified Poisson regression to determine the association between independent variables and dependent variables and obtain unadjusted prevalence ratios. Modified Poisson regression was used because the prevalence of the outcome variables including good knowledge about cervical cancer and positive attitudes towards cervical cancer health education and counseling were above 10%. When the prevalence is above 10%, the odds ratios obtained by methods such as logistic regression tend to overestimate the relative risk. Besides, it gives estimates that are robust and does not overestimate variance (Barros and Hirakata, 2003).

Variables with p values less than 0.25 were selected for the next step. These were assessed for Multicollinearity and if any two variables had a correlation coefficient, $r \geq 0.40$ (Grewal et al., 2004), one of the two variables was selected for the multivariable modified Poisson regression. Multivariable modified Poisson regression model was used to obtain determinants of good knowledge and positive attitude towards cervical cancer health education and counseling. Stepwise forward and backward elimination methods was used to build the model and obtain adjusted prevalence ratios. Wald's test statistic was used to test the significance of variables in the model. Interactions were checked and controlled for in addition to confounders. A good model was ensured by considering a model with small Akaike Information Criterion (AIC) and

Bayesian Information Criterion (BIC) (Akaike, 1998, Omari-Sasu et al., 2016). Furthermore, the same models were run for multivariable logistic regression and the model with the best goodness-of-fit as per Homer Lemeshow's test was considered (Hosmer and Lemeshow, 1980). Variables in this model were then also considered for multivariable modified Poisson regression model. The model with the best goodness-of-fit in multivariable modified Poisson regression was considered. Factors with $p < 0.05$ were considered statistically significant. Results were then expressed as adjusted prevalence ratios (PR) and their 95% confidence intervals (CI).

5.11 Ethical consideration

Ethics review and approval was sought from the Makerere University School of Public Health Research and Ethics Committee (MakSHS-REC) (Appendix 3). Permission to access community drug outlets and collect data was obtained from Kampala Capital City Authority - Kawempe Division's office of the Town Clerk (Appendix 4). Informed written consent was obtained from the study participants prior to data collection. Study participants were explained to the aim and purpose of the study, benefits, risks, and asked for their voluntary participation. They were also reassured of withdrawing from the study at any time they felt unhappy. Information was then collected in a way to ensure privacy. Study participants were informed that all the data obtained from them was to be kept confidential by using codes instead of personal identifiers.

CHAPTER 6: RESULTS

6.1 Description of study participants

6.1.1 Sociodemographic characteristics of study participants

The total study participants were 410 and all these were included in the analysis as there was no missing data. The median age of the respondents was 26 with an interquartile range of 24-29. Two thirds of the study participants (272; 66.3%) were females. A third of the study participants were enrolled nurses (139; 33.9%). Majority of the study participants had attained a diploma (181; 36.1%). More than half the study participants had attained their highest educational level at a private institution (236; 57.6%) and were Baganda by tribe (221; 53.9%). Majority of the study participants were Pentecostals (123; 30%). More than half of the study participants were never married (234; 57.1%) as in table 1.

Table 1. Socio-demographic characteristics of health workers in community drug outlets in Kawempe division

Variable	Frequency (n=410)	Percentage (%)
Age in years, median (IQR)	26 (24 – 29)	
Gender		
Male	138	33.7
Female	272	66.3
Current qualification		
Pharmacist	64	15.6
Pharmacy technician	120	29.4
Nursing officer	4	1.0
Enrolled nurse	139	33.9
Registered nurse	59	14.4
Enrolled comprehensive nurse	24	5.9
Highest educational level		
Certificate	148	36.1
Diploma	181	44.2
Bachelor's degree	78	19.0
Master's degree	3	0.7
Training institution		
Private institution	236	57.6
Public institution	174	42.4
Tribe		
Muganda	221	53.9
Munyankore	45	11.0
Musoga	26	6.3
Mukiga	28	6.8
Mutooro	13	3.2
Munyoro	9	2.2
Others	68	16.6
Religion		
Anglican	106	25.9
Catholic	113	27.6
Pentecostal/born again	123	30.0
Moslem	51	12.4
Seventh-day Adventist	16	3.9
None	1	0.2
Marital status		
Never married	234	57.1
Married	148	36.1
Cohabiting	26	6.3
Divorced/separated	2	0.5

6.1.2 Work-related characteristics of study participants

More than three-quarters of the study participants were from retail pharmacies (346; 84.4%).

The median years of working in a community drug outlet was 2 (IQR; 1 – 3) years and about

half had worked in the community drug outlet for less than two years (198; 48.3%). More than half of the study participants had worked elsewhere in a clinical setting (239; 58.9%). The median average working hours in a week was 64.5 (IQR; 52 – 84) hours and majority of the study participants were working for between 61 and 90 hours in a week (179; 43.7%). The median average number of clients seen by study participants in a day was 40 (IQR; 25 – 50) clients and most of the study participants see between 21 to 40 patients in a day (153; 37.3%). The median average number of female clients was 20 (IQR; 15 – 20) clients and most of the study participants see between 10-20 are female patients (166; 40.5%). This has been summarized in table 2.

Table 2. Work-related characteristics of health workers in community drug outlets in Kawempe division.

Variable	Frequency (n = 410)	Percentages (%)
Respondents based on community drug outlet type		
Retail pharmacy	348	84.9
Drug shop	62	15.1
Years of working in community drug outlet		
0-1	198	48.3
2-3	139	33.9
4-5	44	10.7
6 and above	29	7.1
Having worked anywhere else		
No	171	41.7
Yes	239	58.3
Other health settings worked in (n = 239)		
Hospital	142	58.4
Clinic	97	40.6
Average number of hours worked in a week		
1-30	31	7.6
31-60	163	39.8
61-90	179	43.7
91 and above	37	9.0
Average number of clients seen in a day		
1-20	91	22.2
21-40	153	37.3
41-60	126	30.7
61 and above	40	9.8
Average number of female clients seen in a day		
1-10	51	12.4
11-20	166	40.5
21-30	120	29.3
31-40	42	10.2
41 and above	31	7.6

6.1.3 Awareness of cervical cancer, source of information, and prior related behavior of study participants

All the study participants had ever heard of cervical cancer and most of these heard of it during school training (351; 85.6%). About a third of the study participants had received a formal training on cervical cancer (125; 30.5%). The median years since last formal training on cervical cancer was 3 (IQR; 0.5 – 4) years and majority last heard the training less than 2 years ago (42; 33.6%). Majority of the study participants (266; 64.9%) had never received clients seeking knowledge about cervical cancer. Among the 144 study participants who received clients seeking knowledge, the median number of clients seeking knowledge was 2 (IQR; 1 – 2) clients. Majority of these study participants had less than 3 clients seeking for this knowledge (115/144; 79.86%). About a third of the study participants had interacted with a cervical cancer patient in a month (158; 38.5%). The median number of patients with cervical cancer interacted with, was 2 (IQR; 1 – 2) patients and majority of the study participants had interacted with less than 3 patients in a month (124/158; 78.5%). More than half of the females had never screened for cervical cancer (187; 68.8%) as summarized in table 3.

Table 3. Awareness of cervical cancer, source of information, and prior related behavior for the health workers in community drug outlets in Kawempe division.

Variable	Frequency (n = 410)	Percentages (%)
Heard of cervical cancer		
Yes	410	100
No	0	0
Place where cervical cancer was first heard		
During school training	351	85.6
During training for current job	6	1.5
From colleague at workplace	10	2.4
During in-service training	5	1.2
Radio	23	5.6
TV	9	2.2
Other	6	1.5
Training on cervical cancer		
Yes	125	30.5
No	285	69.5
Time in years since last training (n=125)		
0-1	42	33.6
2-3	36	28.8
4-5	22	17.6
6 and above	25	20
Average number of clients seeking knowledge on cervical cancer in a month		
None	266	64.9
1-2	115	28.1
3-4	16	3.9
5 and above	13	3.2
Average number of cervical cancer patients interacted within a month		
None	252	61.5
1 – 2	124	30.2
3 – 4	21	5.1
5 and above	13	3.2
Cervical cancer screening history of female health workers (n = 272)		
No	187	68.8
Yes	85	31.3
Reason for cervical cancer screening of female health workers (n = 85)		
Recommendation by Friend	1	1.2
Recommendation by Health worker	14	16.5
Prior knowledge	70	82.4

6.2 Prevalence of good knowledge about cervical cancer

The mean knowledge score was 25.1 with a standard deviation of 5.49. The proportion of study participants who scored equal and above 25.1, hence having good knowledge were 212 (51.7%)

[95% CI: 46.75% – 56.64%]). The proportion of study participants who scored below the mean score were 198 (48.3% [95% CI: 43.36% - 53.25%]).

6.2.1 Knowledge of prevalence, risk factors, and signs and symptoms of cervical cancer

About three-quarters of the study participants knew that cervical cancer is the most prevalent cancer among women (73.9%) and that it should be a concern for women younger than thirty-five years (83.9%). The most reported risk factors included; being infected with sexually transmitted diseases (89.8%), having many sexual partners (90.24%), and being infected with human papilloma virus (87.80%). The most reported signs and symptoms of cervical cancer were; pain during sex (82.4%), bleeding after sex (82.4%), and pain in the pelvic region (84.2%). This has been summarized in table 4.

Table 4. Knowledge of prevalence, risk factors, and signs and symptoms of cervical cancer among health workers in community drug outlets in Kawempe division in Kampala district (n = 410)

Question	Correct response	Wrong response
Prevalence of cervical cancer		
Cervical cancer is the most common cancer among women in Uganda	303 (73.9)	107 (26.1)
Cervical cancer should not be of concern for women younger than thirty-five years of age.	344 (83.9)	66 (16.1)
Risk factors		
Long-term use of oral contraceptives is one of the risk factors of cervical cancer.	258 (62.9)	152 (37.1)
Using intrauterine devices (IUDs) increases the risk of developing cervical cancer	266 (64.9)	144 (35.1)
Having multiple full-term pregnancies increases the risk of developing cervical cancer	155 (37.8)	255 (62.2)
Having a first full-term pregnancy below 20 years increases the risk of developing cervical cancer	155 (37.8)	255 (62.2)
Eating food low in fruits and vegetables increases the risk of developing cervical cancer	88 (78.5)	322 (78.5)
Having a family member who has ever had cervical cancer increases the risk of developing cervical cancer	205 (5)	205 (5)
Having sexually transmitted infections increase the risk of developing cervical cancer.	368 (89.8)	42 (10.2)
Becoming sexually active at an age below 18 years increases the risk of developing cervical cancer	321 (78.3)	89 (21.7)
Having many sexual partners increases the risk of developing cervical cancer	370 (90.2)	40 (9.8)
Smoking cigarettes increases the risk of developing cervical cancer	109 (26.6)	301 (73.4)
Human papillomavirus (HPV) increases the risk of developing cervical cancer	360 (87.8)	50 (12.2)
Signs and symptoms		
Pain during sex is a sign of cervical cancer	338 (82.4)	72 (17.6)
Bleeding after sex is a sign of cervical cancer	338 (82.4)	72 (17.6)
Bleeding after menopause is a sign of cervical cancer	311 (75.9)	99 (24.2)
Bleeding/spotting in between periods is a sign of cervical cancer	240 (58.5)	170 (41.5)
Heavier than normal menstruation is a sign of cervical cancer	255 (62.2)	155 (37.8)
Pain in pelvic region is a sign of cervical cancer	345 (84.2)	65 (15.9)
Blood in urine is a sign of cervical cancer	275 (67.1)	135 (32.9)
Problems while urinating or having a bowel movement is a sign of cervical cancer	247 (60.2)	163 (39.8)
Swelling of legs is a sign of cervical cancer	86 (21)	324 (79)

6.2.2 Knowledge of prevention, treatment and referral centers regarding cervical cancer

Majority of the study participants (97.8%) indicated that appropriate early screening for cervical cancer reduces cervical cancer mortality. However, the most recognized method of

detecting cervical cancer was HPV test (79%). More than three-quarters of the study participants (89.3%) indicated that HPV vaccination reduces the risk of developing cervical cancer. Radiation combined with chemotherapy for later stages of chemotherapy was the main treatment method reported (70.2%). Majority of the study participants also reported that treatment is a long and a painful procedure (82%) and that it affects fertility (88.3%). Majority of the respondents (96.6%) also indicated that there are referral centers to screen and diagnose women in Uganda as summarized in table 5.

Table 5. Knowledge of prevention, treatment, and referral of cervical cancer among health workers in community drug outlets in Kawempe division in Kampala district (n = 410)

Question	Correct response	Wrong response
Prevention		
Appropriate early screening for cervical cancer reduces cervical cancer mortality.	401 (97.8)	9 (2.2)
Visual Acetic Acid (VIA) is one of the methods used to detect the presence of cervical cancer.	260 (63.4)	150 (36.6)
Papanicolaou (Pap) test is one of the methods used to detect the presence of cervical cancer.	265 (64.6)	145 (35.4)
HPV test is one of the methods used to detect the presence of cervical cancer.	324 (79.0)	86 (21.0)
To detect cervical cancer, women above twenty-five years of age should at least be screened every three years for cervical cancer.	352 (85.9)	58 (14.2)
VIA is painful.	99 (24.2)	311 (75.9)
VIA is safe.	225 (54.9)	185 (45.1)
HPV vaccination reduces the risk of developing cervical cancer.	366 (89.3)	44 (10.7)
Women should receive HPV vaccine when above twenty-six years old.	196 (47.8)	214 (52.2)
Treatment		
Hysterectomy is the surgical procedure of choice for patients diagnosed with early-stage cervical cancer.	271 (66.1)	139 (33.90)
Surgery combined with chemotherapy is the main treatment for earlier stages of cervical cancer.	272 (66.3)	138 (33.7)
Radiation combined with chemotherapy is the main treatment for earlier stages of cervical cancer.	133 (32.4)	277 (67.6)
Radiation combined with chemotherapy is the main treatment for later stages of cervical cancer.	288 (70.2)	122 (29.8)
Treatment for cervical cancer is a long and painful process.	336 (82.0)	74 (18.1)
Treatment of cervical cancer affects fertility.	362 (88.3)	48 (11.7)
Referral centers		
There are centers used to screen and diagnose women with cervical cancer in Uganda.	396 (96.6)	14 (3.4)

6.2.3 Mean scores of the subsections of knowledge of cervical cancer

Out of the six subsections of knowledge of c, the most correctly answered questions were prevalence of cervical cancer (62.0%), knowledge on presence of referral centers (96.6%), and signs and symptoms of cervical cancer (59.8%) as shown in table 6.

Table 6. Mean scores of the subsections of knowledge of cervical cancer among health workers in community drug outlets in Kawempe division (n = 410)

Knowledge subsection	Mean score	Good knowledge (%)	Poor knowledge (%)
Prevalence	1.6 ± 0.57	254 (62.0)	156 (38.1)
Risk Factors	6.5 ± 2.03	213 (52.0)	197 (48.1)
Signs and symptoms	5.9 ± 2.47	245 (59.8)	165 (40.2)
Prevention	6.1 ± 1.79	199 (48.5)	211 (51.5)
Treatment	4.1 ± 1.33	185 (45.1)	225 (54.9)
Referral centers	1.0 ± 0.18	396 (96.6)	14 (3.4)

6.3 Prevalence of positive attitude towards cervical cancer health education and counseling

The mean attitude score was 61 with a standard deviation of 5. In this study, 158 (38.5% [95% CI: 33.8% – 43.4%]) study participants scored equal to and/or above the mean score and therefore had positive attitude towards cervical cancer health education and counseling. On the other hand, 252 (61.5% [95% CI: 56.6% - 66.2%]) study participants scored below the mean in the attitude questions and therefore had poor attitudes towards cervical cancer health education and counseling.

There were 89 (21.7%) study participants who strongly agreed that they should be involved in cervical cancer health education and counseling activities at work. There were 74 (18.1%) study participants who strongly agreed that integrating cervical cancer health promotion into their daily practice is important. There were 61(14.9%) study participants who strongly agreed that they felt confident and prepared to provide cervical cancer health promotion. There were 94 (22.9%) study participants who strongly agreed that discussing cervical cancer awareness with their female patients is beneficial and can save their lives. There were 81 (19.7%) study participants who strongly agreed that providing cervical cancer counseling to their female patients is their responsibility as a healthcare workers. There were 90 (22%) study participants who strongly agreed that it important to discuss cervical cancer with their female patients to encourage cervical cancer early screening and detection. There were 90 (22%) study participants who strongly agreed that patients would appreciate if they referred them to a gynaecologist for cervical cancer screening. The results have been displayed in table 7

Table 7. Attitude of health workers towards cervical cancer prevention and control in community drug outlets in Kawempe division (n = 410).

Question	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)
I should be involved in cervical cancer health promotion activities at work.	3 (0.7)	9 (2.2)	9 (2.2)	300 (73.2)	89 (21.7)
Integrating cervical cancer health promotion into my daily practice is important.	1 (0.2)	5 (1.2)	12 (2.9)	318 (77.6)	74 (18.1)
I feel confident and prepared to provide cervical cancer health promotion	3 (0.7)	14 (3.4)	31 (7.6)	301 (73.4)	61 (14.9)
Discussing cervical cancer awareness with my female patients in the community pharmacy/drug shop is beneficial and can save their lives.	0 (0)	3 (0.7)	9 (2.2)	304 (74.2)	94 (22.9)
Providing cervical cancer counseling to my female patients in the community pharmacy/drug shop is my responsibility as a healthcare worker.	0 (0)	4 (1.0)	11 (2.7)	314 (76.6)	81 (19.8)
Distributing cervical cancer educational materials is important in the community drug outlet.	1 (0.2)	9 (2.2)	19 (4.6)	316 (77.1)	65 (15.9)
It is important to discuss cervical cancer with my female patients to encourage cervical cancer early screening and detection	0 (0)	4 (1.0)	6 (1.5)	310 (75.6)	90 (22.0)
There is enough evidence to suggest that I can influence patients to adopt cervical cancer screening practices in this community.	0 (0)	24 (5.9)	69 (16.8)	276 (67.3)	41 (10.0)
Inviting healthcare professionals to provide cervical cancer education to the female patients in this community pharmacy/drug shop is important.	0 (0)	22 (5.4)	40 (9.8)	283 (69.0)	65 (15.9)
Providing cervical cancer counseling to my patients can improve my professional status and increase my professional satisfaction.	0 (0)	7 (1.7)	16 (3.9)	316 (77.1)	71 (17.3)
Providing cervical cancer counseling is an effective use of my time	1 (0.2)	12 (2.9)	29 (7.1)	324 (79.0)	44 (10.7)
If I have access to patient education materials related to cervical cancer, I am more likely to provide cervical cancer health promotion to my female patients.	0 (0)	7 (1.7)	21 (5.1)	309 (75.4)	73 (17.8)
Patients would like me as a healthcare worker to counsel them on cervical cancer screening and early detection.	0 (0)	2 (0.5)	21 (5.1)	337 (82.2)	50 (12.2)
Patients appreciate my effort as a healthcare worker to counsel them on cervical cancer.	0 (0)	4 (1.0)	35 (8.5)	332 (81.0)	39 (9.5)
Patients would appreciate if I refer them to a gynaecologist for cervical cancer screening.	2 (0.5)	2 (0.5)	12 (2.9)	304 (74.2)	90 (22.0)

6.4 Factors associated with good level of knowledge of cervical cancer

Bivariate analysis was conducted using chi square and modified Poisson regression and data was summarized using unadjusted prevalence ratios. Variables whose p values was less than 0.25 were considered for multivariable analysis.

6.4.1 Bivariate analysis of socio-demographic factors associated with good level of knowledge of cervical cancer.

Marital status has been regrouped into not married and married with the notion that the unmarried have no support whereas the married have support. Religion was regrouped by combining Anglicans, Catholics, Seventh-day Adventists and Pentecostals into Christians and Moslems and non-religious study participants into non-Christians.

Highest education level was the only variable statistically significantly associated with good knowledge of cervical cancer. This has been summarized in table 8.

Table 8. Bivariate analysis of socio-demographic factors associated with good level of knowledge of cervical cancer among health workers in community drug outlets in Kawempe division in Kampala district (n=410).

Predictors	Knowledge		Unadjusted PR PR (95% CI)	p values
	Good (%)	Poor (%)		
Age				
19 – 23	28 (49.1)	29 (50.9)	1.0	
24 – 28	123 (50.2)	122 (49.8)	1.02 (0.76 – 1.37)	0.884
29 – 33	40 (56.3)	31 (43.7)	1.15 (0.82 – 1.60)	0.422
34 and above	21 (56.8)	16 (43.2)	1.16 (0.79 – 1.70)	0.464
Gender				
Male	76 (55.1)	62 (44.9)	1.0	
Female	136 (50.0)	136 (50.0)	0.91 (0.75 – 1.10)	0.324
Qualification				
Pharmacist	40 (62.5)	24 (37.5)	1.0	
Pharmacy technician	60 (50.0)	60 (50.0)	0.8 (0.62 – 1.04)	0.094
Nursing officer/ registered nurse	31 (49.2)	32 (50.8)	0.79 (0.57 – 1.08)	0.137
Enrolled nurse	68 (48.9)	71 (51.1)	0.78 (0.61 – 1.01)	0.060
Enrolled comprehensive nurse	13 (54.2)	11 (45.8)	0.87 (0.57 – 1.31)	0.499
Highest educational level				
Certificate	72 (48.7)	76 (51.4)	1.0	
Diploma	86 (47.5)	95 (52.5)	0.98 (0.78– 1.22)	0.838
Degree and above	54 (66.7)	27 (33.3)	1.37 (1.09 – 1.72)	0.006
Training institution type				
Private institution	114 (48.3)	122 (51.7)	1.0	
Public institution	98 (56.3)	76 (43.7)	1.17 (0.97 – 1.40)	0.106
Marital status				
Not married	114 (48.3)	122 (51.7)	1.0	
Married	98 (56.3)	76 (43.7)	1.17 (0.97 – 1.40)	0.106
Religion				
Non-Christians	22 (42.3)	30 (57.7)	1.0	
Christians	190 (53.1)	168 (46.9)	1.25 (0.90 – 1.75)	0.181
Tribe				
Muganda	117 (52.9)	104 (47.1)	1.0	
Munyankore	24 (53.3)	21 (46.7)	1.08 (0.75 – 1.36)	0.962
Musoga	10 (38.5)	16 (61.5)	0.73 (0.44 – 1.20)	0.213
Mukiga	16 (57.1)	12 (42.9)	1.08 (0.76 – 1.52)	0.664
Others	45 (50.0)	45 (50.0)	0.94 (0.74 – 1.20)	0.643

6.4.2. Bivariate analysis of work-related factors associated with good level of knowledge of cervical cancer.

Community drug outlet type, having worked in a clinical setting, hours worked, average number of patients seen in a day, and average number of female patients seen in a day were

statistically associated with good knowledge of cervical cancer. This has been summarized in table 9.

Table 9. Bivariate analysis of work-related factors associated with good level of knowledge of cervical cancer among health workers in community drug outlets in Kawempe division in Kampala district (n=410).

Predictors	Knowledge		Unadjusted PR PR (95% CI)	p values
	Good (%)	Poor (%)		
Respondents based on community drug outlet type				
Retail pharmacy	188 (54.0)	160 (46.0)	1.0	
Drug shop	24 (38.7)	38 (61.3)	0.72 (0.52 – 1.00)	0.047
Years worked in a community drug outlet				
0 – 1	96 (48.5)	102 (51.5)	1.0	
2 – 3	76 (54.7)	63 (45.3)	1.13 (0.92 – 1.39)	0.259
4 – 5	21 (47.7)	23 (52.3)	0.98 (0.70 – 1.38)	0.928
6 and above	19 (65.5)	10 (34.5)	1.35 (1.00 – 1.83)	0.050
Having worked in a clinical setting				
Never	80 (46.8)	91 (53.2)	1.0	
Yes, in a clinic	43 (44.3)	54 (55.7)	0.95 (0.72 – 1.25)	0.701
Yes, in a hospital	89 (62.7)	53 (37.3)	1.34 (1.09 – 1.64)	0.005
Average number of hours worked in a week				
1 – 64	115 (56.1)	90 (43.9)	1.0	
65 and above	97 (47.3)	108 (52.7)	0.84 (0.70 – 1.02)	0.077
Average number of patients seen in a day				
1 – 20	34 (37.4)	57 (62.6)	1.0	
21 – 40	83 (54.3)	70 (45.8)	1.45 (1.07 – 1.97)	0.016
41 – 60	79 (62.7)	47 (37.3)	1.68 (1.24 – 2.26)	0.001
61 and above	16 (40.0)	24 (60.0)	1.07 (0.67 – 1.70)	0.773
Average number of female patients seen in a day				
1 – 10	21 (41.2)	30 (58.8)	1.0	
11 – 20	78 (47.0)	88 (53.0)	1.14 (0.79 – 1.65)	0.480
21 – 30	74 (61.7)	46 (38.3)	1.50 (1.05 – 2.14)	0.027
31 – 40	27 (64.3)	15 (35.7)	1.56 (1.05 – 2.34)	0.028
41 and above	12 (38.7)	19 (61.3)	0.94 (0.54 – 1.63)	0.826

6.4.3 Bivariate analysis of sources of information and prior related behavioral factors associated with good level of knowledge of cervical cancer.

Attendance of a formal training on cervical cancer, time since last training, interaction with cervical cancer patients, and cervical cancer screening status were statistically significantly associated with good knowledge about cervical cancer. This is summarized in table 10.

Table 10. Bivariate analysis of sources of information and prior related behavioral factors associated with good level of knowledge of cervical cancer among health workers in community drug outlets in Kawempe division in Kampala district (n=410).

Predictors	Knowledge		Unadjusted PR PR (95% CI)	p values
	Good (%)	Poor (%)		
Place where cervical cancer was first heard				
During training for current job/school	187 (51.7)	175 (48.3)	1.0	
Multimedia	17 (50.0)	17 (50.0)	0.97 (0.68 – 1.37)	0.856
Society	8 (57.1)	6 (42.9)	1.11 (0.69 – 1.76)	0.671
Attendance of a formal training on cervical cancer				
No	131 (46.0)	154 (54.0)	1.0	
Yes	81 (64.8)	44 (35.2)	1.41 (1.18 – 1.69)	<0.001
Time in years since last training				
0 – 1	24 (57.1)	18 (42.9)	1.0	
2 – 3	23 (63.9)	13(36.1)	1.12 (0.78 – 1.60)	0.544
4 – 5	14 (63.6)	8 (36.4)	1.11 (0.74 – 1.68)	0.609
41 and above	20 (80.0)	5 (20.0)	1.4 (1.01 – 1.94)	0.045
Interaction with clients seeking knowledge on cervical cancer in a month				
None	134 (50.4)	132 (49.6)	1.0	
1 – 2	60 (52.2)	55 (47.8)	1.04 (0.84 – 1.28)	0.746
3 and above	18 (62.1)	11 (37.9)	1.23 (0.90 – 1.68)	0.185
Average number of cervical cancer patients interacted with in a month				
None	110 (43.7)	142 (56.4)	1.0	
1 – 2	78 (62.9)	46 (37.1)	1.44 (1.19 – 1.75)	<0.001
3 and above	24 (70.60)	10 (29.4)	1.62 (1.25 – 2.09)	<0.001
Cervical cancer screening history of female health workers (n = 272)				
Yes	57 (67.1)	28 (32.9)	1.0	
No	79 (42.3)	108 (57.8)	0.63 (0.50 – 0.79)	<0.001
Reason for cervical cancer screening of female healthcare workers				
Recommendation from a Friend/health worker	7 (46.7)	8 (53.3)	1.0	
Prior knowledge	50 (71.4)	20 (28.6)	1.53 (0.87 – 2.69)	0.139

6.4.4. Multivariable analysis of factors associated with good level of knowledge of cervical cancer.

Highest education level, marital status, training institution type, community drug outlet type, having worked in a clinical setting, hours worked, average number of clients seen in a day, average number of female clients seen in a day, attendance of a formal training on cervical cancer, time since last training, interaction with cervical cancer patients, and cervical cancer

screening status, reason for cervical cancer screening status were considered for multivariable analysis because their p values were less than 0.25. Additionally, age and gender were taken as potential confounders.

Multivariable analysis was conducted using modified Poisson regression to obtain adjusted prevalence ratios. For variables that were multicollinear as per the collinearity diagnostics, one of them was chosen for multivariable analysis. After adjusting for other variables, included attendance of cervical cancer training (APR = 1.28, 95%CI: 1.07 – 1.54, p = 0.008), interaction with one or two cervical cancer patients (APR = 1.35, 95%CI: 1.10 – 1.64, p = 0.003), interaction with three or more cervical cancer patients (APR = 1.47, 95%CI: 1.13 – 1.97, p = 0.005), and seeing 41 to 60 clients in a day (APR = 1.53, 95%CI: 1.13 – 2.09, p = 0.006) were statistically significantly associated with good knowledge of cervical cancer.

The prevalence of good knowledge about cervical cancer was higher among health workers who had interacted with one or two patients with cervical cancer in a month than those who had never interacted with patients having cervical cancer in a month and this was statistically significant at 95% level of significance while adjusting for other variables (APR = 1.35, 95%CI: 1.10 – 1.64, p = 0.003).

The prevalence of good knowledge about cervical cancer was higher among health workers who had interacted with three or more patients with cervical cancer in a month than those who had never interacted with patients having cervical cancer in a month and this was statistically significant at 95% level of significance while adjusting for other variables APR = 1.47, 95%CI: 1.13 – 1.97, p = 0.005).

The prevalence of good knowledge about cervical cancer was higher among health workers who had ever attended a training on cervical cancer than those who had not attended a training and this was statistically significant at 95% level of significance while adjusting for other variables (APR = 1.28, 95%CI: 1.07 – 1.54, p = 0.008).

The prevalence of good knowledge about cervical cancer was higher among health workers who see between 41 and 60 clients in a day than those who see between 1 and 20 clients in a day and this was statistically significant at 95% level of significance while adjusting for other variables (APR = 1.53, 95%CI: 1.13 – 2.09, p = 0.006). This is summarized in table 11.

Table 11. Multivariable analysis of factors associated with good knowledge among health workers in community drug outlets in Kawempe division (n = 410).

Predictors	Knowledge		Adjusted PR PR (95% CI)	p values
	Good (%)	Poor (%)		
Average number of clients seen in a day				
1 – 20	34 (37.4)	57 (62.6)	1.0	
21 – 40	83 (54.3)	70 (45.8)	1.31 (0.96 – 1.78)	0.083
41 – 60	79 (62.7)	47 (37.3)	1.53 (1.13 – 2.09)	0.006
61 and above	16 (40.0)	24 (60.0)	0.92 (0.59 – 1.45)	0.869
Attendance of a training on cervical cancer				
No	131 (46.0)	154 (54.0)	1.0	
Yes	81 (64.8)	44 (35.2)	1.28 (1.07 – 1.54)	0.008
Interaction with cervical cancer patients in a month				
None	110 (43.7)	142 (56.4)	1.0	
1 – 2	78 (62.9)	46 (37.1)	1.35 (1.10 – 1.64)	0.003
3 and above	24 (70.6)	10 (29.4)	1.47 (1.13 – 1.93)	0.005
Respondents based on community drug outlet type				
Retail pharmacy	188 (54.0)	160 (46.0)	1.0	
Drug shop	24 (38.7)	38 (61.3)	0.85 (0.62 – 1.17)	0.322

6. 5 Factors associated with positive attitude towards cervical cancer health education and counseling

6.5.1. Bivariate Analysis of social demographic factors associated positive attitudes towards cervical cancer health education and counseling

Marital status was reclassified into not married and married with a notion that one does not have support while the other has support. Religion was regrouped by combining Anglicans, Catholics, Seventh-day Adventists and Pentecostals into Christians and Moslems and non-religious study participants into non-Christians.

Qualification and highest education level were statistically significantly associated with positive attitudes towards cervical cancer health education and counseling. This is summarized in table 12.

Table 12. Bivariate Analysis of social demographic factors associated positive attitudes towards cervical cancer health education and counseling among health workers in community drug outlets in Kawempe division in Kampala district (n= 410)

Predictors	Attitude		PR		p value
	Positive (%)	Negative (%)	Unadjusted (95% CI)	PR	
Age					
19 – 23	23 (40.4)	34 (59.7)	1.0		
24 – 28	91 (37.1)	154 (62.9)	0.92 (0.65 – 1.31)		0.648
29 – 33	29 (40.9)	42 (59.2)	1.01 (0.66 – 1.54)		0.955
34 and above	15 (40.5)	22 (59.5)	1.00 (0.61 – 1.66)		0.985
Gender					
Male	52 (37.7)	86 (62.3)	1.0		
Female	106 (39.0)	166 (61.0)	1.03 (0.80 – 1.34)		0.801
Qualification					
Pharmacist	22 (34.4)	42 (65.6)	1.0		
Pharmacy technician	30 (25.0)	90 (75.0)	0.73 (0.46 – 1.15)		0.174
Nursing officer/registered nurse	30 (47.6)	33 (52.4)	1.39 (0.90 – 2.12)		0.134
Enrolled nurse	62 (44.6)	77 (55.4)	1.30 (0.88 – 1.91)		0.186
Enrolled comprehensive nurse	14 (58.3)	10 (41.7)	1.70 (1.05 – 2.74)		0.030
Highest educational level					
Certificate	70 (47.3)	78 (52.7)	1.0		
Diploma	63 (34.8)	118 (65.2)	0.74 (0.57 – 0.96)		0.022
Degree and above	25 (30.9)	56 (69.1)	0.65 (0.45 – 0.94)		0.023
Training institution					
Private institution	99 (42.0)	137 (58.1)	1.0		
Public institution	59 (33.9)	115 (66.1)	0.81 (0.63 – 1.04)		0.104
Tribe					
Muganda	81 (36.7)	140 (63.4)	1.0		
Munyankore	20 (44.4)	25 (55.6)	1.21 (0.84 – 1.76)		0.307
Musoga	12 (46.2)	14 (53.8)	1.26 (0.80 – 1.98)		0.316
Mukiga	11 (39.3)	17 (60.7)	1.07 (0.65 – 1.75)		0.782
Others	34 (37.8)	56 (62.2)	1.03 (0.75 – 1.42)		0.852
Religion					
Non-Christians	25 (48.1)	27 (51.9)	1.0		
Christians	133 (37.2)	225 (62.8)	0.77 (0.56 – 1.06)		0.107
Marital status					
Not married	89 (37.4)	107 (63.3)	1.0		
Married	69 (39.7)	105 (60.3)	1.05 (0.82 – 1.35)		0.689

6.5.2 Bivariate Analysis of work-related factors associated positive attitudes towards cervical cancer health education and counseling

Years of working in a community drug outlet, average number of hours worked in a week, average number of clients seen in a day and average number of female clients seen in a day were statistically significantly associated with positive attitudes towards cervical cancer health education and counseling as shown in table 13.

Table 13. Bivariate Analysis of work-related factors associated positive attitudes towards cervical cancer health education and counseling among health workers in community drug outlets in Kawempe division in Kampala district (n= 410)

Predictors	Attitude		PR		p value
	Positive (%)	Negative (%)	Unadjusted	PR (95% CI)	
Respondents by community drug outlet type					
Retail pharmacy	129 (37.1)	219 (62.9)	1.0		
Drug shop	29 (46.8)	33 (53.2)	1.26 (0.94 – 1.70)		0.128
Years of working in a community drug outlet					
0 – 1	66 (33.3)	132 (66.7)	1.0		
2 – 3	61 (43.9)	78 (56.1)	1.32 (1.00 – 1.73)		0.048
4 – 5	18 (40.9)	26 (59.1)	1.23 (0.82 – 1.84)		0.324
6 and above	13 (44.8)	16 (55.2)	1.34 (0.86 – 2.11)		0.197
Having worked in a clinical setting					
Never	60 (35.1)	111 (64.9)	1.0		
Yes, in a clinic	45 (46.4)	52 (53.6)	1.32 (0.98 – 1.78)		0.064
Yes, in a hospital	53 (37.3)	89 (62.7)	1.06 (0.79 – 1.43)		0.682
Average number of hours worked in a week					
1 – 30	17 (54.8)	14 (45.2)	1.0		
31 – 60	35 (21.5)	128 (78.5)	0.39 (0.25 – 0.60)		<0.001
61 – 90	84 (46.9)	95 (53.1)	0.86 (0.60 – 1.22)		0.391
91 and above	22 (59.5)	15 (40.5)	1.08 (0.72 – 1.64)		0.703
Average number of clients seen in a day					
1-20	46 (50.6)	45 (49.5)	1.0		
21-40	46 (30.1)	107 (69.9)	0.59 (0.43 – 0.82)		0.001
41-60	45 (35.7)	81 (64.3)	0.71 (0.52 – 0.96)		0.028
61 and above	21 (52.5)	19 (47.5)	1.04 (0.73 – 1.49)		0.836
Female clients seen in a day					
1 – 10	28 (54.9)	23 (45.1)	1.0		
11 – 20	55 (33.1)	111 (66.9)	0.60 (0.43 – 0.84)		0.003
21 – 30	39 (32.5)	81 (67.5)	0.59 (0.41 – 0.85)		0.004
31 – 40	16 (38.1)	26 (61.9)	0.69 (0.44 – 1.10)		0.119
41 and above	20 (64.5)	11 (35.5)	1.18 (0.82 – 1.69)		0.381

6.5.3. Bivariate Analysis of source of information, knowledge of cervical cancer, and prior related behavior factors associated positive attitudes towards cervical cancer health education and counseling

Place where cervical cancer was first heard, average number of clients seeking knowledge about cervical cancer in a month, and reason for cervical cancer screening were statistically significantly associated with positive attitudes towards cervical cancer health education and counseling as summarized in table 14.

Table 14. Bivariate Analysis of source of information, knowledge of cervical cancer and prior related behavior factors associated positive attitudes towards cervical cancer health education and counseling among health workers in community drug outlets in Kawempe division in Kampala district (n= 410)

Predictors	Attitude		PR		p value
	Positive (%)	Negative (%)	Unadjusted	PR (95% CI)	
Place where cervical cancer was first heard					
During school training	132 (37.6)	219 (62.4)	1.0		
During current job/in-service training/colleague at workplace	5 (23.8)	16 (76.2)	0.63 (0.29 – 1.38)		0.249
TV/radio/Others	21 (55.3)	17 (44.7)	1.47 (1.07 – 2.02)		0.017
Attendance of training on cervical cancer					
No	108 (37.9)	177 (62.1)	1.0		
Yes	50 (40.0)	75 (60.0)	1.06 (0.81 – 1.37)		0.685
Time in years since training (n=125)					
0 – 1	11 (26.2)	31 (73.8)	1.0		
2 – 3	16 (44.4)	20 (55.6)	1.70 (0.91 – 3.18)		0.099
4 – 5	14 (63.6)	8 (36.4)	2.43 (1.33 – 4.43)		0.004
6 and above	9 (36.0)	16 (64.0)	1.37 (0.66 – 2.86)		0.394
Average number of clients seeking knowledge on cervical cancer in a month					
None	90 (33.8)	176 (66.2)	1.0		
1 – 2	51 (44.4)	64 (55.7)	1.31 (1.01 – 1.71)		0.046
3 and above	17 (58.6)	12 (41.4)	1.73 (1.22 – 2.46)		0.002
Average number of cervical cancer patients interacted with in a month					
None	88 (34.9)	164 (65.1)	1.0		
1 – 2	53 (42.7)	71 (57.3)	1.22 (0.94 – 1.59)		0.135
3 and above	17 (50.0)	17 (50.0)	1.43 (0.98 – 2.09)		0.062
Cervical cancer screening history of female health workers (n = 272)					
Yes	34 (40.0)	51 (60.0)	1.0		
No	72 (38.5)	115 (61.5)	0.96		0.814
Reason for cervical cancer screening of female health workers(n=85)					
Friend/health worker	12 (80.0)	3 (20.0)	1.0		
Prior knowledge	22 (31.4)	48 (68.6)	0.39 (0.26 – 0.60)		<0.001
Knowledge score					
Poor knowledge	83 (41.9)	115 (58.1)	1.0		
Good knowledge	75 (35.4)	137 (64.6)	0.84 (0.66 – 1.08)		0.175

6.5.4. Multivariable Analysis of factors associated positive attitudes towards cervical cancer health education and counseling

Qualification, highest education level, religion , Years of working in a community drug outlet, average number of hours worked in a week, average number of clients seen in a day and average number of female clients seen in a day, community drug outlet type, having worked in a clinical

setting, place where cervical cancer was first heard, average number of clients seeking knowledge about cervical cancer in a month, and reason for cervical cancer screening, average number of cervical cancer patients interacted with in a month, time in years since training, good knowledge of cervical cancer, were considered for multivariable analysis because they had p values of less than 0.25. Age and Gender were considered as potential confounders in this analysis.

Multivariable analysis was conducted using modified Poisson regression to obtain adjusted prevalence ratios. For variables that were multicollinear as per the collinearity diagnostics, one of them was chosen for multivariable analysis. After adjusting for other variables, working between 31 to 60 hours a week (APR = 0.47, 95% CI: 0.30 – 0.74, p = 0.001), having 1 or 2 clients seeking knowledge about cervical cancer (APR = 1.33, 95% CI: 1.05 – 1.69, p = 0.019), having 3 or more clients seeking knowledge about cervical cancer (APR: 1.75, 95% CI: 1.18 – 2.59, p = 0.006), and serving between 21 to 40 clients in a day (APR = 0.71, 95% CI: 0.52 – 0.96, p = 0.028) were associated with positive attitude towards cervical cancer health education and counseling.

The prevalence of positive attitude towards cervical cancer health education and counseling was lower among health workers who worked 31 to 60 hours a week than those who worked less than 31 hours a week and this was statistically significant at 95% level of significance while adjusting for other variables (APR: 0.47, 95% CI: 0.30 – 0.74, p = 0.001).

The prevalence of positive attitude towards cervical cancer health education and counseling was higher among health workers who had ever had one or two clients seeking knowledge on cervical cancer than those who had never heard clients seeking knowledge of cervical cancer in a month and this was statistically significant at 95% level of significance while adjusting for other variables (APR: 1.33, 95% CI: 1.05 – 1.69, p = 0.019).

The prevalence of positive attitude towards cervical cancer health education and counseling was higher among health workers who had ever had at least three clients seeking knowledge on cervical cancer than those who had never heard clients seeking knowledge of cervical cancer in a month and this was statistically significant at 95% level of significance while adjusting for other variables (APR: 1.75, 95% CI: 1.18 – 2.59, p = 0.006).

The prevalence of positive attitude towards cervical cancer health education and counseling was lower among health workers who served between 21 to 40 clients in a day than those who

served less than 21 clients in a day and this was statistically significant at 95% level of significance while adjusting for other variables (APR = 0.71, 95% CI: 0.52 – 0.96, p = 0.028)

Though no statistically significant, clinical significance was found in the fact that enrolled comprehensive nurses had higher attitudes towards cervical cancer health education and counseling than pharmacist (APR: 1.57, 95% CI: 0.98 – 2.49, p = 0.059). This has been summarized in table 15.

Table 15. Multivariable analysis of factors associated with positive attitude towards cervical cancer health education and counseling among health workers in community drug outlets in Kawempe division in Kampala district (n = 410)

Variable	Attitude		Adjusted (95% CI)	PR	p values
	Positive (%)	Negative (%)			
Religion					
Non-Christians	25 (48.1)	27 (51.9)	1.0		
Christians	133 (37.2)	225 (62.8)	0.81 (0.61 – 1.07)		0.131
Hours worked in a week					
1 – 30	17 (54.8)	14 (45.2)	1.0		
31 – 60	35 (21.5)	128 (78.5)	0.47 (0.30 – 0.74)		0.001
61 – 90	84 (46.9)	95 (53.1)	0.90 (0.63 – 1.29)		0.564
91 and above	22 (59.5)	15 (40.5)	0.96 (0.63 – 1.47)		0.854
Average number of clients seeking knowledge about cervical cancer					
None	90 (33.8)	176 (66.2)	1.0		
1 – 2	51 (44.3)	64 (55.7)	1.33 (1.05 – 1.69)		0.019
3 and above	17 (58.6)	12 (41.4)	1.75 (1.18 – 2.59)		0.006
Average number of clients seen in a day					
1-20	46 (50.5)	45 (49.5)	1.0		
21-40	46 (30.1)	107 (69.9)	0.71 (0.52 – 0.96)		0.028
41-60	45 (35.7)	81 (64.3)	0.91 (0.67 – 1.23)		0.529
61 and above	21 (52.5)	19 (47.5)	1.05 (0.74 – 1.48)		0.790
Qualification					
Pharmacist	22 (34.4)	42 (65.6)	1.0		
Pharmacy technician	30 (25.0)	90 (75.0)	0.76 (0.49 – 1.17)		0.207
Nursing officer/registered nurse	30 (47.6)	33 (52.4)	1.27 (0.84 – 1.94)		0.258
Enrolled nurse	62 (44.6)	77 (55.4)	1.16 (0.79 – 1.68)		0.447
Enrolled comprehensive nurse	14 (58.3)	10 (41.7)	1.57 (0.98 – 2.49)		0.059

CHAPTER 7: DISCUSSION

This study assesses the prevalence of good knowledge about cervical cancer and attitudes of health workers in community drug outlets towards cervical cancer health education and counseling. It thus provides insight into the training needs and interventions needed to provide a supportive environment for cervical cancer health education and counseling.

7.1 Knowledge about cervical cancer, its prevention, and management

7.1.1 Proportion of health workers with good knowledge about cervical cancer, its prevention, and management

In this study, 51.7% of the study participants had good knowledge about cervical cancer. This means that many of the health workers aren't equipped with enough knowledge about cervical cancer. This is quite similar to a study in Ethiopia (51.5%) (Berhanu et al., 2019). However, some studies have reported either higher or lower proportions of study participants with good knowledge. Studies in Northern Uganda (60%) (Obol et al., 2021), Somalia (63.5%) (Altunkurek et al., 2022) and Burundi (76.3%) (Ndizeye et al., 2018) found higher proportions of good knowledge about cervical cancer. The difference could have arisen because the study participants in Northern Uganda were conducted among health workers in health facilities who received training as per the Ministry of Health Strategic Plan for Cervical Cancer Prevention and Control. The difference from the study of Somalia could have been because study participants were mainly bachelor-holder health professionals, unlike the present study which included mainly certificate-holder health workers and thus subjected to different depth of trainings. The difference from the study in Burundi could be due to the fact that the study in Burundi interviewed only general practitioners who are degree holders unlike the current study which had mostly certificate holders who receive different depth of training.

On the other hand, the score in this study was higher than that of an Ethiopian study (46.4%) (Getahun et al., 2019) possibly because most study participants in the Ethiopian study had practiced for more years and were not updated with the latest information on cervical cancer compared to the study participants in this study. The low levels of knowledge of cervical cancer among study participants in this study imply the low awareness about cervical cancer's epidemiology, risk factors, signs and symptoms, prevention, and treatment among the community members. This demonstrates the need for interventions such as continuous medical education by the supervising pharmacists and/or respective professional bodies. Nevertheless, Ministry of Health in collaboration with other health organisations could develop policies to aid the delivery of these trainings.

Moreover, though many study participants knew of the prevalence of cervical cancer, majority of the study participants had poor knowledge in prevention and treatment strategies. Therefore, the interventions should aim at improving knowledge in all areas but most especially prevention and treatment as these are the basis for decreased morbidity and mortality due to cervical cancer. These results are quite different from a study in Somalia in which 57% and 69.6% had adequate knowledge on cancer screening and HPV scale questions respectively (Altunkurek et al., 2022). The difference could have arisen because the study participants in Somalia had achieved more advanced form of earning (postgraduate) which could have added on their prior knowledge unlike study participants in this study. Poor knowledge about cervical cancer screening and treatment among health workers could result into unmet desired 90-70-90 WHO targets of cervical cancer prevention by 2030. Besides, it may hinder the goals of the Uganda National Cervical Cancer Prevention and Control Strategic Plan 2018 – 2023 of ensuring the all population is aware about cervical cancer, 100% HPV1 and HPV2 vaccination uptake, 40% increase in screening and treatment of all cervical cancer with cancer. Good health communication requires adequate knowledge about cervical cancer and therefore training needs should highly focus in equipping health workers with knowledge on cervical cancer prevention and treatment.

7.1.2 Factors associated with knowledge about cervical cancer, it's prevention, and management.

Attendance status of formal cervical cancer training

This study indicated that attendance status of cervical cancer training was associated with good knowledge of cervical cancer. This means that when health workers are provided with a formal training on cervical cancer, this will highly improve on their knowledge about cervical cancer. This is similar to the findings of a study in Cote d'Ivoire (Tchounga et al., 2014), and in Northern Uganda (Obol et al., 2021). The similarity with previous studies demonstrates the importance of specialized trainings in improving knowledge of cervical cancer because this is an issue of public health importance. Such trainings provide more in-depth knowledge, skills and understanding about cervical cancer epidemiology, prevention and treatment while clarifying misconceptions. A knowledgeable healthcare worker can easily communicate efficiently and empower the community members to take control over their health. In addition, these usually provide quality care. Efforts should therefore be undertaken to ensure exposure of information about cervical cancer to all health workers including those in community drug outlets. These efforts may range from, in-service trainings, workshops, and professional

bodies-based trainings. A quasi-experimental study in Nigeria revealed that the knowledge and competence of health workers about cervical cancer and its prevention, significantly increased following a competent-based training (Umuago et al., 2020). Nevertheless, Ministry of Health in collaboration with other health organisations could develop policies to aid the delivery of these trainings.

Interaction with patients with cervical cancer

This study indicated that there was an association between good knowledge and interaction of health workers with patients living with cervical cancer. It implied that the prevalence of good knowledge increased when study participants interacted with more cervical cancer patients. Even though there is limited accessible literature to this association, the role of health workers in community drug outlets has been described (Egbewande et al., 2022, Broadfield et al., 2017, International Pharmaceutical Federation, 2022). Discussion with patients with cervical cancer about their condition has a beneficial effect towards both healthcare workers and the patients. It improves the knowledge and skills of health workers regarding cervical cancer disease because they obtain firsthand information regarding the disease and the challenges faced by these patients. Besides it builds their capacity in recommending appropriate prevention and control activities to other community members and referrals. To the patient, it enables them cope with different circumstances such as reminders on next appointments to the health facility to receive treatment and health education on diets, and education on how to manage adverse effects. Nevertheless, as the world is transitioning from use of intravenous medications, community drug outlets may serve as dispensing points for such anti-cancer drugs thus improving accessibility to those medications and overcoming some barriers such as greater distances to health facilities. This may increase the proportion of women with suspected cancer that receive treatment and adhere to it.

Average number of clients seen in a day

This study indicated that patient daily workload was significantly associated with knowledge about cervical cancer among health workers. It implied that health workers who see a moderate number of clients in a day have quite higher levels of knowledge about cervical cancer unlike their counterparts who see very few clients. This could be due to the fact that these have significantly more exposure to a variety of people with different diseases hence better experiences. Regardless of no available accessible literature explaining this regarding cervical cancer, studies in other areas such as psychology have showed that learning increases with the

increase in strength of exposure/stimuli (Yerkes and Dodson, 1908). This could imply that increased interaction with clients improves the attention and focus of health workers which could increase their knowledge. However, no significantly higher knowledge is attained with interacting with more clients in a day. This could potentially be because of the less time available to interact with other resources such as fellow health workers, books of health, to equip themselves with knowledge, among others. Heavy workloads can also lead to poor patient-provider communication (Gurses, 2008). This also provides more negative effect such as increased stress hence a reduction in performance and knowledge (Bruggen, 2015). Therefore, interventions such as provision of guideline, pamphlets, handbooks, and any relevant information and educational materials could aid these health workers to build their knowledge in cervical cancer when not busy. This could therefore grant them enough time to provide education about preventive measures rather than focusing on only immediate health concerns. Informed community members can easily take-up these preventive options hence reduced incidence, mortality, and morbidity to cervical cancer. Nevertheless, Ministry of health may aid in the access of these guidelines to these health workers through refining the existing policies. Where possible improving staffing levels may be done by managers.

Years of experience

Years of experience was not associated with good knowledge of cervical cancer. This is similar to other studies in Saudi Arabia (Heena et al., 2019) and in Northern Uganda (Obol et al., 2021). This could be because even though those who had worked for more years may have acquired knowledge through this practice, the ones who had worked for less years may have acquired such knowledge from school training.

Type of health facility

Type of health facility was not associated with good knowledge of cervical cancer. This is similar to other studies in Saudi Arabia (Heena et al., 2019), in Northern Uganda. (Obol et al., 2021). This could be because majority of retail pharmacies and drug shops that participated in this study employed health workers with quite similar education levels.

Age

Age was not associated with good knowledge about cervical cancer. This is similar to a study in northern Uganda (Obol et al., 2021). However, a study in Saudi Arabia found different results. In that study, younger age was significantly associated with higher knowledge of

cervical cancer (Heena et al., 2019). The difference could have been because of the different levels of education and years of experience of the study participants as these are higher in the participants of Saudi Arabia and could result in higher levels of knowledge about cervical cancer even for the young study participants being statistically significant.

Educational level

Educational level was not associated with good knowledge about cervical cancer. This is similar to studies of Saudi Arabia (Heena et al., 2019). This could be because relative to individuals with higher educational levels, those with lower educational level could have obtained information on cervical cancer through other means such as self-study, interaction with cervical cancer patients, social media, among others hence improving their knowledge.

Gender

Gender was not associated with good knowledge of cervical cancer as in Northern Uganda (Obol et al., 2021). This could have been because by the fact that the study participants were health workers, both the males and females might have been exposed to the same information about cervical cancer hence having no association between gender and knowledge of cervical cancer. Besides, few female health workers had been screened for cervical cancer hence having limited exposure to reproductive health education to achieve statistical significance.

7.2 Attitudes towards cervical cancer health education and counseling

7.2.1 Proportion of health workers with positive attitudes towards cervical cancer health education and counseling

In this study, 38.5% of the study participants had positive attitudes towards cervical cancer health education and counseling. These results reflect the limited practices of cervical cancer health education and counseling practices in community drug outlets and that few are willing to offer these services. They also demonstrate that very few health workers recognize the significance of providing health education and counseling on cervical cancer in community drug outlets. Even though there is limited published literature about this phenomenon among health workers in community drug outlets, health workers in other settings including hospitals have quite higher attitudes towards cervical cancer prevention and control (Obol et al., 2021, Tchounga et al., 2014). The higher attitudes of these health workers could be because they work in settings with established policies on cervical cancer and that there are efforts to offer training. With the rising incidence of cervical cancer in Uganda and the late presentations of patients with cervical cancer to health facilities, if health workers who are not only strategically

located but also part of the most accessible ones have poor attitudes towards offering preventive and referral services, these will continue to rise. Poor attitudes lead to limited verbal persuasion to empower patients to take control over their health. This therefore could hinder the 2023 Uganda National Strategic Plan for cervical cancer prevention and control of increasing accessibility to cervical cancer prevention services, HPV vaccination, early screening and detection as several barriers such as stigma and ignorance of cervical cancer screening and its centers aren't addressed. Interventions should therefore focus on improving attitudes of health workers towards cervical cancer prevention and control. These may include but not limited to refining of established policies on the provision of cervical cancer prevention and control by health workers in different sectors of health, training of health workers in community drug outlets, strengthening of partnerships with other players in the health sector, provision of incentives, and providing supportive work environments.

7.2.2 Factors associated with positive attitudes towards cervical cancer health education and counseling

Average weekly working hours

Longer working hours were negatively associated with cervical cancer health education and counseling. There is limited accessible research about the association between working hours and attitudes towards healthcare workers in community drug outlets. However, it has been evidenced that longer working hours are some of the occupational hazards that influence attitude at work through health (Chu, 2021, Bulotaité et al., 2017). Longer working hours contribute to higher levels of exhaustion and also impact mental changes. Healthcare workers working long hours could therefore not be willing to adopt any more work such as health education apart from providing immediate treatment. This could contribute to low awareness of cervical cancer in the communities. This implies that workforce planning practices need to be improved in community drug outlets in addition to trainings in case interventions such as cervical cancer prevention and control are to be integrated into care. For healthcare workers working long hours, breaks may be introduced in their shifts and/or incentives may be considered for health workers who work for longer hours to enable them have positive attitudes towards cervical cancer health education and counseling and hence offer health education and counseling services. Nevertheless, provision of supportive resources on cervical cancer and health education within the premises of these outlets may help in improving their attitudes.

Average number of clients seeking knowledge about cervical cancer in a month

Health workers who had clients seeking knowledge about cervical cancer had significantly higher attitudes towards cervical cancer health education and counseling. This means that the higher the interaction with clients seeking knowledge about cervical cancer, the more likely they have higher positive attitude towards cervical cancer health education and counseling. Interaction of health workers with individuals seeking knowledge on cervical cancer enables them to learn more about the disease and this also allows them appreciate the significance of providing knowledge to the public about cervical cancer through health education and counseling. Studies encompassing other diseases have found similar associations (Dapaah, 2016). This essentially implies that creating awareness about cervical cancer through several means such as schools, multimedia among others may improve the health seeking behavior of community members. Improved health seeking behavior of the general population encourages health workers in community drug outlets to provide health education and counseling to the clients. Several of such encounters also increase the knowledge of health workers regarding cervical cancer, attitude of health workers towards cervical cancer health education and counseling, patient-provider communication, and trust to adopt prevention and control behaviors among community members.

Average number of clients seen in a day

Average number of clients seen in a day was negatively associated with positive attitudes towards cervical cancer health education and counseling. This could imply that moderate patient workload in a day may result into fatigue to the health workers thereby having less time available for health education and counseling, hence negative attitudes towards this practice. Studies encompassing other conditions demonstrated similar result (Mannava et al., 2015). If such health workers are not in position to offer health education and counseling about cervical cancer, it leads to low awareness about the disease among the community members and thus low adoption of healthy behaviors to reduce the risk of incidence, morbidity and mortality due to cervical cancer yet such facilities which serve many clients are good platforms to target the general population. Besides revising policies that mandate health workers in this part of the health sector to provide cervical cancer health education and counseling, Ministry of Health may consider use of incentives and recognition of high performing health workers in referring patients to nearby health centres to boost their attitudes towards health education and counseling. Where possible, managers may also improve staffing levels

Qualification

In this study, qualification was not statistically associated with positive attitudes towards cervical cancer health education and counseling. This means that no health professional cadre had statistically significantly higher or lower attitude towards cervical cancer health education and counseling than pharmacists. However, enrolled comprehensive nurses had clinically significantly higher attitudes towards cervical cancer health education and counseling than pharmacists. Therefore, interventions such as training about cervical cancer to improve the positive attitudes are more required in all cadre of health professionals working in community drug outlets. These results are quite similar to the study in Northern Uganda where qualification did not achieve statistical significance (Obol et al., 2021). However, for a study in Ethiopia, qualification was significantly associated with positive attitudes (Abebaw et al., 2022). The differences could have been because the study in Ethiopia had diverse health workers including medical doctors and midwives, unlike the present study. With no cadre having statistically significantly higher attitude towards cervical cancer health education and counseling in this study, it hinders cervical cancer prevention activities in this sector. However, since enrolled comprehensive nurses had clinically significantly higher attitudes, it implies that with good knowledge about cervical cancer, they can effectively provide health education and counseling to the community members they serve. This can therefore improve cervical cancer screening rates, HPV vaccination, and adoption of good health behaviors. Nevertheless, positive attitudes towards cervical cancer health education and counseling imply that these health professionals can effectively build patient-provider relationships and through the continuous engagements, trust may result. In such situations, clients can easily adhere to health promoting behaviours.

Years of experience

Years of experience was not associated with positive attitude towards cervical cancer health education and counseling. This is similar to a study in Northern Uganda (Obol et al., 2021). This could be because health education and counselling has not been the usual practice within this setting has not been the usual practice with no differences in capacity and skills achieved to conduct this among those who have worked for less years and those worked for more years.

Gender

Gender was not associated with positive attitude towards cervical cancer health education and counseling. This is similar to a study in Northern Uganda (Obol et al., 2021). This could be because both male and female study participants have similar prior knowledge on cervical

cancer and the significance of providing cervical cancer health education and counseling in this setting.

Type of health facility

Type of health facility was not associated with positive attitude towards cervical cancer health education and counseling. This is similar to a study in Northern Uganda (Obol et al., 2021). This could be because both health workers in retail pharmacies and drug shops have similar knowledge regarding to cervical cancer and the significance of providing cervical cancer health education and counseling in this setting.

Religion

In this study, religion was not associated with positive attitudes towards cervical cancer health education and counseling. However, there is no accessible literature regarding the association between religion and cervical cancer health education and counseling. The lack of association could have been because both the Christians and the non-Christians earned similar knowledge regarding cervical cancer and hence having quite no differences in their attitudes towards cervical cancer health education and counseling.

7.3 Study limitations

In this study, recall bias could have happened because study participants were required to remember some past events including time since last training, having ever screened for cervical cancer, having ever had any client seek knowledge on cervical cancer, and having interacted with a patient with cervical cancer. However, this was addressed by proper restructuring of questions in the questionnaire and use of categories in data analysis. Social desirability bias could have also resulted since the questionnaire asked female health workers if they had ever screened for cervical cancer and also had likert scale in the questions assessing health worker's attitudes towards cervical cancer health education and counseling. This was addressed in that research assistants informed the study participants about the aim of the study, that their information will be kept confidential, and they were requested to be as honest as possible in providing responses. Sampling bias hence less accurate and less precise estimates might have been introduced by the use of consecutive sampling. These results may therefore not be generalizable to the entire population of health workers working in community drug outlets. Nevertheless, this bias was minimized by selecting a large sample size of this study population. This study also used a cut-off of the mean to assess the proportions of study participants with good knowledge of cervical cancer and those with positive attitudes towards cervical cancer

health education and counseling which could have either underestimated or overestimated such proportions. This however has been used in literature but demonstrates the need for standardized cut-offs. However, the results of this study could thus not be generalizable to health workers including nurses, pharmacists, and pharmacy technicians working outside community drug outlets. This study also used multivariable Poisson regression for assessing factors associated with good knowledge and positive attitudes towards cervical cancer health education and counseling which does not have a known published method of assuming goodness-of-fit of the model. However, to ensure that the model was fitting the variables well, small AIC and BIC were considered and the same model was run in multivariable logistic regression. The model with the best goodness-of-fit as per Homer Lemeshow's test were $p = 0.91$ (chi2 of 3.38) for attitude towards cervical cancer health education and counseling and $p = 0.63$ (chi2 of 5.22) for knowledge of cervical cancer.

CHAPTER 8: CONCLUSION

- This study revealed that healthcare workers in community drug outlets are quite limited in knowledge regarding cervical cancer epidemiology, prevention, and treatment as only 51.7% had good knowledge.
- Attendance of cervical cancer training, interaction with one or more cervical cancer patients, and seeing between forty-one clients and sixty clients in a day were associated with good knowledge of cervical cancer.
- This study also revealed that few healthcare workers in community drug outlets had positive attitudes towards cervical cancer health education and counseling as these were only 38.5%.
- Working between thirty-one and sixty hours in a week, interaction with one or more clients seeking knowledge on cervical cancer, and seeing between twenty-one and forty clients in a day were associated with positive attitude towards cervical cancer health education and counseling.

9.0 RECOMMENDATIONS

- Ministry of Health should consider revising the National Cervical Cancer Strategic Plan to include health workers in community drug outlets as this will clearly stipulate the role of these in cervical cancer prevention and control.
- To equip health workers in community drug outlets with knowledge about cervical cancer, there is an urgent need for a formal training through continuous medical education by professional bodies and/or leading organisations in cervical cancer prevention and control such as ministry of Health and Uganda Cancer Institute. Ministry of Health in collaboration with various health organisations/professional bodies could aid in establishing policies or strengthen existing policies encompassing comprehensive in-service training of health workers in community drug outlets on cervical cancer such as continuous professional development activities. These policies may also cover provision of the guidelines, information, and education materials to these health workers as a way to enable them boost their knowledge in cervical cancer and also enable them have positive attitudes towards cervical cancer health education and counseling and hence effectively provide these services.
- Ministry of Health working with various health organisations may consider provision of incentives to health workers in community drug outlets to enable them have positive attitudes towards cervical cancer health education and counseling. Nevertheless, recognition may be provided to health workers who are performing well in health education and counseling such as in referral of community members to the nearest health facilities for cervical cancer prevention and control services.
- Managers of community drug outlets need to ensure supportive interventions including provision of guidelines, information, and education materials to health workers to enable them boost their knowledge in cervical cancer and also enable them have positive attitudes towards cervical cancer health education and counseling and hence effectively provide these services. Nevertheless, managers should also provide moderate length of shifts for their health workers and introduce breaks in shifts for those that work for long hours.
- Since the attitudes of health workers towards cervical cancer health education and counseling were quite low, qualitative studies should be conducted about the barriers and facilitators to positive attitude towards cervical cancer health education and counseling.

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11.0 APPENDICES

11.1 Appendix 1: Consent form

CONSENT FORM FOR A STUDY AMONG HEALTHCARE WORKERS IN COMMUNITY DRUG OUTLETS

Research title; Knowledge and attitudes of cervical cancer health promotion and associated factors among health workers in community drug outlets in Kawempe division in Kampala district; A cross-sectional study.

Principal investigator: Nakamanya Sharon Kitibwakye

Version date; V1.0, JANUARY 25th 2023.

Dear participant,

My name isand I am a research assistant for a study “Knowledge and attitudes towards cervical cancer health promotion and associated factors among health workers in community drug outlets in Kawempe division.”

Introduction

You will be asked to participate in this study because you are healthcare worker working in community drug outlets in Kawempe division.

This study is being conducted by Nakamanya Sharon Kitibwakye a masters of public health student in Makerere University as a requirement for completion of this training. Because you have decided to participate in this study, we want you to know as much as possible about the purpose of the study, how the study will be conducted, any risks and benefits and what is expected of you.

This is a consent form. It gives information about the study. The study staff will give you more information about the study and read to you this consent form. If you agree to participate, we will ask you to sign this consent form and a copy of this form will be provided for you to keep.

Aim of the study: To assess the knowledge and attitudes towards cervical cancer health promotion and associated factors among health workers in community drug outlets in Kawempe division in Kampala district

Purpose of the study: information about the level of knowledge and attitudes of these healthcare workers will aid in identifying the gaps in this study population. These will be

addressed and will equip the health workers with adequate knowledge and skills which will be an addition to awareness and health promotion by the health sector. It will also inform policy makers in the design of interventions in community drug outlets to ensure enhanced cervical cancer health promotion and reduced incidence and mortality.

Benefits of the study: there is no direct benefit for you as the respondent. The information provided will be used by the researchers to inform the development of interventions to improve cervical cancer health promotion in community drug outlets.

Risks of the study: There are minimal anticipated risks for participating in this study. You may feel uncomfortable answering a few questions. However, by participating in this study, you will be contributing to better understanding of the issues regarding cervical cancer health promotion in community drug outlets. We hope these findings will inform interventions that lead to better practice in community drug outlets. Participating in this study will not cost you any money or property.

Approval of the study: ethical approval will be obtained from an accredited Ugandan based Research and Ethics Committee of Makerere University College of health Sciences, School of Public Health Research and Ethics Committee (IRB) and Uganda National Council of Science and Technology (UNCST).

Participation: participation in this study is voluntary. If you do not want to answer a particular question, that is okay. There is no wrong answer to the questions that I will ask. Please feel free to answer the questions exactly how you feel. You are free to withdraw from the study at any point you want without penalty. If you have any questions, comments or concerns in relation to this study, you may ask me or contact Dr. Nakamanya Sharon Kitibwakye, the investigator of the project on +256705545644 or by email at amanyashaeranie@gmail.com.

Confidentiality: Information about all study participants will be collected, but only the people working in the study will see it. The universities and research organisations running this study are not allowed to let others know the identity of the people in the study. The records will be kept in limited access, locked office and will only be accessed by study workers. Your name will not be written in any reports based on this research. People or organisations which may review your records include the Uganda Ministry of Health, Makerere School of Public Health Research and Ethics Committee (MakSPH REC) and Uganda National Council of Science and Technology (UNCST).

I understand that the results of this study will be kept strictly confidential, and used only for research purposes. My name will not appear anywhere on the coded forms with the information. Paper and computer records will be kept under lock and key and with password protection respectively. The interviewer has discussed this information with me and offered to answer my questions. For any further questions regarding my welfare and rights as a research participant, I may contact the Chairperson of the School of Public Health Research and Ethics Committee (MakSPH REC) or Uganda National Council of Science and Technology (UNCST) Tel. +256 (041) 4705500.

STATEMENT OF CONSENT

.....has described to me what is going to be done, the risks, the benefits involved and my rights regarding this study. In the use of this information, my identity will be concealed. I am aware that I may withdraw at any time. I understand that by signing this form, I don't not waive any of my legal rights but merely indicate that I have been informed about the research study in which I am voluntary agreeing to participate. A copy of this form will be provided to me.

Are you willing to participate in this study?

Yes No

Name Signature

Age Date (DD/MM/YY).....

Name of interviewerSignature

Date (DD/MM/YY).....

11.2 Appendix 2: Questionnaire

Questionnaire for “Knowledge and attitudes towards cervical cancer health promotion and associated factors among health workers in community drug outlets in Kawempe division in Kampala district”

Participant ID: ____/____/____

Parish name.....Village

Date: ____/____/____ Interviewer’s ID.....

Please mark a tick in the box applicable to your most appropriate response.

SECTION 1: Socio-demographic characteristics

S/No	Questions	Responses
1.1	How old are you now?	Age in complete years
1.2	Gender	1. Male 2. Female
1.3	What is your current qualification?	1. Pharmacist 2. Pharmacy technician 3. Nursing officer 4. Enrolled Nurse 5. Registered Nurse 6. Enrolled Comprehensive Nurse 7. Registered Public Health Nurse
1.4	What is the highest education level you have attained?	1. No formal education 2. Primary 3. O level 4. A level 5. Vocational 6. Diploma 7. Degree 8. Masters 9. Others (specify)
1.5	Where did you attain this highest level of education from?	1. Private institution 2. Public institution
1.6	What is your tribe?	1. Muganda 2. Munyankore 3. Musoga 4. Mukiga 5. Munyoro 6. Mutooro 7. Others (specify)

1.7	What is your religion?	<ol style="list-style-type: none"> 1. Anglican 2. Catholic 3. Pentecostal/born again 4. Moslem 5. Seventh-day Adventist 6. None 7. Others (specify)
1.8	What is your marital status?	<ol style="list-style-type: none"> 1. Married 2. Cohabiting 3. Divorced or separated 4. Widowed 5. Never married

SECTION 2. Work-related characteristics

S/No	Questions	Responses
2.1	Community drug outlet type	<ol style="list-style-type: none"> 1. Community pharmacy 2. Drug shop
2.14	How many years have you worked in a community drug outlet?	In complete years
2.15	Did you work anywhere else before?	<ol style="list-style-type: none"> 1. Yes 2. No (skip to question 2.17)
2.16	If yes, where else?	<ol style="list-style-type: none"> 1. Hospital 2. Clinic
2.17	On average, how many hours do you work per week?	
2.18	On average, how many patients do you interact with per day?	
2.19	On average, how many female patients do you interact with per day?	

SECTION 3: Source of information about cervical cancer

S/No	Questions	Responses
3.1	Have you heard of cervical cancer?	<ol style="list-style-type: none"> 1. Yes 2. No (skip to the end)
3.2	When did you hear about cervical cancer for the first time?	<ol style="list-style-type: none"> 1. During school training 2. During training for current job 3. From colleague at workplace 4. During in-service training 5. Radio 6. TV 7. Others, specify.....

3.3	Have you ever attended a training program on cervical cancer?	1. Yes 2. No (skip to 4.1)
3.4	When did you last have a training in cervical cancer?	MM/YYYY

Section 4. Prior-related behaviour

S/No	Questions	Responses
4.1	Has any client ever sought knowledge about cervical cancer from you?	1. Yes 2. No (skip to 4.3)
4.2	If yes, how many per month?	
4.3	Have you ever interacted with patients about cervical cancer with regard to their condition?	1. Yes 2. No (skip to 4.5)
4.4	If yes, what is the approximate number of cervical cancer patients interacted with per month	
4.5	<i>For female healthcare workers only</i> Have you ever screened for cervical cancer?	1. Yes 2. No (skip to 5.1)
4.6	If yes, what prompted you to screen for cervical cancer	1. Friends 2. Health worker 3. Prior knowledge 4. Others (specify)

SECTION 5: Knowledge about cervical cancer

	Question	Yes	No	I don't know
Prevalence of cervical cancer				
5.1	Cervical cancer is the most common cancer among women in Uganda			
5.2	Cervical cancer should not be of concern for women younger than thirty-five years of age.			
Risk factors				
5.3	Long-term use of oral contraceptives is one of the risk factors of cervical cancer.			
5.4	Using intrauterine devices (IUDs) increases the risk of developing cervical cancer			
5.5	Having multiple full-term pregnancies increases the risk of developing cervical cancer			
5.6	Having a first full-term pregnancy below 20 years increases the risk of developing cervical cancer			
5.7	Eating food low in fruits and vegetables increases the risk of developing cervical cancer			
5.8	Having a family member who has ever had cervical cancer increases the risk of developing cervical cancer			

5.9	Having sexually transmitted infections increase the risk of developing cervical cancer.			
5.10	Becoming sexually active at an age below 18 years increases the risk of developing cervical cancer			
5.11	Having many sexual partners increases the risk of developing cervical cancer			
5.12	Smoking cigarettes increases the risk of developing cervical cancer			
5.13	Human papillomavirus (HPV) increases the risk of developing cervical cancer			
Signs and symptoms				
5.14	Pain during sex is a sign of cervical cancer			
5.15	Bleeding after sex is a sign of cervical cancer			
5.16	Bleeding after menopause is a sign of cervical cancer			
5.17	Bleeding/spotting in between periods is a sign of cervical cancer			
5.18	Heavier than normal menstruation is a sign of cervical cancer			
5.19	Pain in pelvic region is a sign of cervical cancer			
5.20	Blood in urine is a sign of cervical cancer			
5.21	Problems while urinating or having a bowel movement is a sign of cervical cancer			
5.22	Swelling of legs is a sign of cervical cancer			
Prevention				
5.23	Appropriate early screening for cervical cancer reduces cervical cancer mortality.			
5.24	Visual Acetic Acid (VIA) is one of the methods used to detect the presence of cervical cancer.			
5.25	Papanicolaou (Pap) test is one of the methods used to detect the presence of cervical cancer.			
5.26	HPV test is one of the methods used to detect the presence of cervical cancer.			
5.27	To detect cervical cancer, women above twenty five years of age should at least be screened every three years for cervical cancer.			
5.28	VIA is painful.			
5.29	VIA is safe.			
5.30	HPV vaccination reduces the risk of developing cervical cancer.			
5.31	Women should receive HPV vaccine when above twenty-six years old.			
Treatment				
5.32	Hysterectomy is the surgical procedure of choice for patients diagnosed with early-stage cervical cancer.			
5.33	Surgery combined with chemotherapy is the main treatment for earlier stages of cervical cancer.			
5.34	Radiation combined with chemotherapy is the main treatment for earlier stages of cervical cancer.			


5.35	Radiation combined with chemotherapy is the main treatment for later stages of cervical cancer.			
5.36	Treatment for cervical cancer is a long and painful process.			
5.37	Treatment of cervical cancer affects fertility.			
Referral centres				
5.38	There are centers used to screen and diagnose women with cervical cancer in Uganda.			

SECTION 6: Attitude towards cervical cancer health promotion

	Question	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
6.1	I should be involved in cervical cancer health promotion activities at work.					
6.2	Integrating cervical cancer health promotion into my daily practice is important.					
6.3	I feel confident and prepared to provide cervical cancer health promotion					
6.4	Discussing cervical cancer awareness with my female patients in the community pharmacy/drug shop is beneficial and can save their lives.					
6.5	Providing cervical cancer counseling to my female patients in the community pharmacy/drug shop is my responsibility as a healthcare worker.					
6.6	Distributing cervical cancer educational materials is important in the community drug outlet.					
6.7	It is important to discuss cervical cancer with my female patients to encourage cervical cancer early screening and detection					
6.8	There is enough evidence to suggest that I can influence patients to adopt cervical cancer screening practices in this community.					
6.9	Inviting healthcare professionals to provide cervical cancer education to the female patients in this community pharmacy/drug shop is important.					
6.10	Providing cervical cancer counseling to my patients can improve my professional status and increase my professional satisfaction.					
6.11	Providing cervical cancer counseling is an effective use of my time					
6.12	If I have access to patient education materials related to cervical cancer, I am more likely to					

	provide cervical cancer health promotion to my female patients.					
6.13	Patients would like me as a healthcare worker to counsel them on cervical cancer screening and early detection					
6.14	Patients appreciate my effort as a healthcare worker to counsel them on cervical cancer.					
6.15	Patients would appreciate if I refer them to a gynaecologist for cervical cancer screening.					

11.3 Appendix 3: Approval of the research proposal



MAKERERE UNIVERSITY
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**COLLEGE OF HEALTH SCIENCES
SCHOOL OF PUBLIC HEALTH**
Research and Ethics Committee

12th April 2023

Ms. Nakamanya Sharon Kibwakyé
Master student, (2021/HD07/3468U)
School of Public Health, Makerere University

MAKERERE UNIVERSITY
SCHOOL OF PUBLIC HEALTH
APPROVED
VALID UNTIL
★ 12 APR 2024 ★
RESEARCH & ETHICS COMMITTEE
P.O. BOX 7072, KAMPALA


Re: Approval of a research Proposal titled: “Knowledge and attitudes towards cervical cancer health promotion and associated factors among health workers in community drug outlets in Kawempe Sub- County in Kampala district; A Cross-sectional study.”

This is to inform you that the Makerere School of Public Health Research and Ethics Committee (MakSPH-REC) has approved your study documents for the above referenced research study.

Please note that your study protocol number with MakSPH-REC is **168**. Please be sure to reference this number in any correspondence with MakSPH-REC. Note that your study was first approved by the MakSPH-REC on **12th04/2023**, and therefore approval expires at every annual anniversary of this approval date. The current approval is therefore valid until: **12th04/2024**.

Continued approval is conditional upon your compliance with the following requirements:

- 1) No other consent form(s), questionnaire and/or advertisement documents should be used. The consent form(s) must be signed by each subject prior to initiation of any protocol procedures. In addition, each subject must be given a copy of the signed consent form.



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- 2) All protocol amendments and changes to other approved documents must be submitted to MakSPH-REC and not be implemented until approved by MakSPH-REC except where necessary to eliminate apparent immediate hazards to the study subjects.
- 3) Significant changes to the study site and significant deviations from the research protocol and all unanticipated problems that may involve risks or affect the safety or welfare of subjects or others, or that may affect the integrity of the research must be promptly reported to MakSPH-REC.
- 4) For Masters Students in the School of Public Health, you are required to submit 2 copies of your proposal plus a letter of intention to submit a dissertation giving a period of 3 months to the School of Graduate Studies before you commence data collection

Please complete and submit reports to MakSPH-REC as follows:

- a) Renewal of the study approval – complete and return the continuing Review Report – Renewal Request (Form 404A) at least 60 days prior to the expiration of the approval period. The study cannot continue until re-approved by MakSPH-REC.
- b) Completion, termination, or if not renewing the project – send a final report within 90 days upon completion of the study.

Yours sincerely,



Dr. Joseph Kagaayi

Chairperson: MakSPH- Research and Ethics Committee



11.4 Appendix 4: MakSPH-REC letter of permission to conduct research



**COLLEGE OF HEALTH SCIENCES
SCHOOL OF PUBLIC HEALTH**
Research and Ethics Committee

12th April 2023

To whom it may concern

Dear Sir/Madam,

RE: PERMISSION TO CONDUCT RESEARCH

I hereby introduce to you Ms. Nakamanya Sharon Kitibwakye, a Master Student from Makerere University School of Public Health.

The student is required to conduct research as a requirement for the award of the master's degree. The title of the research study is: **"Knowledge and attitudes towards cervical cancer health promotion and associated factors among health workers in community drug outlets in Kawempe Sub- County in Kampala district; A Cross-sectional study."**

The student presented the research proposal to the Makerere University School of Public Health, Research and Ethics Committee and has been granted approval to go ahead with data collection. Your support in this regard will be highly appreciated.

Yours sincerely,


Dr. Joseph Kagaayi

Chairperson: MakSPH- Research and Ethics Committee



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11.5 Appendix 5: Office OF the town clerk’s letter of permission to conduct research



**KAWEMPE DIVISION URBAN COUNCIL
OFFICE THE TOWN CLERK**

REF: KDUC/KCCA/200

24th May 2023

Nakamanya Sharon Kibwakyé
College of Health Sciences, Makerere University
Kampala

REQUEST TO CONDUCT RESEARCH IN KAWEMPE DIVISION

Reference is made to your letter dated 08th May 2023 requesting to conduct research in Kawempe Division.

After careful consideration, I am pleased to inform you that you have been granted permission to pursue your research project.

Your research initiative, 'Knowledge and attitudes towards cervical cancer health promotion and associated factors among health workers in community drug outlets in Kawempe Division in Kampala' demonstrates your commitment to contributing to the field of Public Health and making a positive impact on the community.

You'll work closely with the Division Medical Officer who will help guide on such factors as attitudes and perception, assessing knowledge levels of health workers and identifying other variables that may influence their attitudes towards cervical cancer promotion in Kampala.

The research will commence on the 24th May 2023 and conclude on 24th June 2023. You will be required to comply with all organizational policies and guidelines, as well as any additional instructions provided by the Division Medical Officer.



Please share any significant findings that may be of interest to KCCA or the wider community. I commend your dedication to making a meaningful contribution to the field of Public Health.



Ronnie K Rubanga
FOR TOWN CLERK

Copy: Chairperson - MakSPH