

Cervical Cancer Screening Status Among Women Living With HIV/AIDS in Malawi: A Cross-Sectional Study

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Abstract

Worldwide, cervical cancer (CC) is the fourth most common cancer among women. Approximately 90% of cervical cancer cases occur in resource limited countries. Malawi is one of the developing countries with the highest incidence (ASR 67.9 per 100,000) of cc and the highest number of deaths (ASR 51.5 per 100,000) from cervical cancer in the world. More than 80% of Malawian women diagnosed with CC are at the inoperable cancer stage and suffer from co-infection with HIV. The purpose of this situation-specific theory guided study was to examine the cervical cancer screening status and factors affecting the screening status among Malawian women living with HIV infection aged 18-50 from HIV support groups in Malawi. A two stage proportionate stratified cluster random sampling method was used to select 291 respondents. The findings indicated that the prevalence of cervical cancer screening rate was 27.8%; and women had a high knowledge level and had a positive attitude towards cervical cancer screening. Despite a high knowledge level and positive attitude regarding screening, the cervical cancer screening rate was still low. The factors independently associated with cervical cancer screening in HIV positive women were: employment, OR = 6.37 (95% CI: 1.32, 30.80), knowledge OR =1.11 (95% CI: 1.03, 1.20), attitude, OR = 1.43 (95% CI: 1.04, 1.97) and social support networks OR =6.8 (95% CI: 1.41, 32.76). Community-based interventions and culturally tailored health education messages which include common myths about cervical cancer, HIV, and screening are critical when designing interventions to promote cervical cancer screening uptake in Malawi.

Keywords: cervical cancer, screening, knowledge, attitude, HIV/AIDS, Malawi

1. Introduction

1.1 Background

Cervical cancer (CC) is one of the top five cancers with the greatest proportion of avoidable cancer mortality (Ferlay et al., 2021). However, developing countries experience a disproportionate share of the disease burden, with approximately 90% of the CC deaths occurring in less developed countries (Arbyn et al., 2018). Malawi is among the developing countries and has the highest incidence of CC (67.9 per 100,000) in the world, almost ten times higher than that reported in the USA (Arbyn et al., 2018). Additionally, more than 80% of Malawian women are diagnosed with CC at an inoperable stage (Fort et al., 2011). The cause of most cervical cancers is human papillomavirus (HPV) infection and Sub-Saharan Africa (SSA) has a high dual burden of HPV and HIV infection (Ferlay et al., 2021; Kohler et al., 2016; Ministry of Health, 2017, 2018). HIV is associated with higher rates of HPV acquisition, decreased clearance of HPV and precancerous lesions, and increased risk of CC (Ferlay et al., 2021). This emphasizes the importance of CC screening for all women, but it is particularly a public health priority among HIV-infected women worldwide. Data from various settings demonstrate that HIV increases the risk of CC by 4-9 times (Firnhaber et al., 2016; Msyamboza et al., 2016; Reddy et al., 2015; Viviano et al., 2017; Whitham et

al., 2017). Delayed detection of CC in HIV-infected women is linked to invasive, inoperable CC with higher mortality from CC than from HIV/AIDS (Firnhaber et al., 2016; Whitham et al., 2017).

No woman should die from cervical cancer. Cervical cancer screening was found to be associated with an overall mortality reduction of 83% if every woman attended screening frequently (Firnhaber et al., 2016). However, a comprehensive review of CC screening among people living with HIV (PLHIV) in Sub-Saharan Africa has estimated that the screening rates range from 2- 20.2% in urban areas and from 0.4- 14% in rural areas (Kohler et al., 2016; Msyamboza et al., 2016; Viviano et al., 2017; Whitham et al., 2017). A recent study has indicated that the number of screening sites increased from 75 to 130 and CC screening rates from 9 to 27% between 2011 and 2015 (Msyamboza et al., 2016). Despite Malawi government recommendations for CCS aimed at addressing HIV-positive women's increased risk of developing CC, the screening rate is still as low as 15.9% in 2015 even though HIV positive women visit antiretroviral therapy (ART) clinics regularly. Though a recent report in 2015 may provide insight into the possible epidemiological transition of CC screening in the past decade, whether the variance in the estimates of CC screening uptakes reflect real changes or methodological approaches has never been studied. Additionally, the 2015 report data was from the Malawi National Cancer Control program and the accuracy and reliability of data obtained from the Health Passport is low. These Malawian health records are unreliable as they are kept by individuals and are often lost or not always carried by patients or health care providers who do not record their practice.

Studies to quantify CC screening uptake with empirical evidence among Malawian women living with HIV are needed to address this problem and more comprehensive research assessments are needed to examine the level of CC screening uptake and factors influencing CC screening behavior as well. Studies and health care development should not be the same for all countries as the root causes of health systems and health care behaviors in the West are not relevant for non-Western countries such as Malawi. Lee and others asserted (2019; 2021) that cancer screening programs reflecting local populations and sociocultural factors need to be developed and/or refined to achieve equity in cancer screening and treatment. As important, researchers should collect contextual and environmental information that may explain or be associated with CC screening behavior.

1.2 Conceptual Model

The situation specific theory, Figure 1, was developed based on a preliminary qualitative pilot study to explore CC screening behavior and its related factors (Mtengezo & Lee, 2018). The proposed Situation Specific Theory provides an explanation of how Malawian women come to make a decision about and act to obtain CC screening. The situation-specific theory takes into account the uniqueness of Malawian women's individual factors, interpersonal relationships factors, and sociocultural factors (Lee et al., 2015; Mtengezo & Lee, 2018).

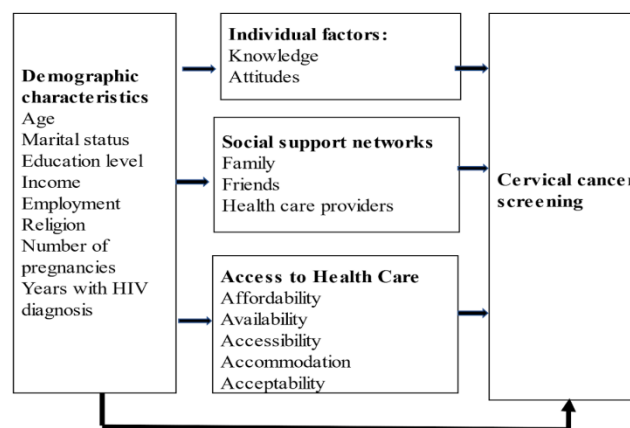


Figure 1. Situation-Specific Framework: Cervical Cancer Screening among HIV Positive Women

The theory emphasizes the need to attend to the unique factors that influence CC screening behaviors of women in their unique situations. The CC screening decision is conceptualized as more than just an individually rational decision but also includes social influences and access to health care. The demographic characteristics are unchangeable external factors that directly and indirectly influence behavior towards CC screening.

1.2.1 Cervical Cancer Screening Uptake: The outcome variable which was obtained by self-report and medical record check of the receipt of vaginal examination from a CC health care provider after HIV diagnosis.

1.2.2 Individual Factors: These refer to individual knowledge and attitude regarding CC and screening. Knowledge was defined as the awareness about CC risk factors, signs and symptoms and screening to prevent CC. Attitude refers to social cultural factors that women living with HIV infection hold such as beliefs, feelings, and fears that influence CC screening behavior.

1.2.3 Social Support Networks: Refers to social influence and social support that women living with HIV get from family members, friends, and health care providers.

1.2.4 Access to Health Care Services: Refers to factors that facilitates or hinders women to receive screening services like availability, accessibility, affordability, accommodation, and acceptability.

1.3 Study Questions

The study answers these research questions: 1) what is the status of CC screening uptake, knowledge level and attitudes regarding CC and screening among Malawian women with HIV infection? 2) What is the relationship between socio-demographic characteristics, knowledge, attitude, social support networks, and access to health care and CC screening behavior among Malawian women living with HIV infection?

2. Method

2.1 Study Design

A descriptive and cross-sectional health survey method was utilized.

2.2 Study Setting

Malawi is a landlocked country in Sub-Saharan Africa with a population of approximately 17.9 million (National Statistical Office (NSO) [MDHS] and ICF, 2017). According to a 2010 WHO report, about 86% of the countries' total population lives in the rural areas; 65% are living in poverty with 27% in extreme poverty (World Health Organization, 2010). The literacy rate is estimated at 75% for women and 83% for men (National Statistical Office (NSO) [MDHS] and ICF, 2017). The country has a low life expectancy of 58 years for men and 60 years for women (World Health Organization, 2010). Some of the contributing factors to low life expectancy include communicable diseases including HIV/AIDS.

Lilongwe District is the capital city of Malawi. The district covers an area of 6,159 square kilometers and has a population of 1,346,360. It is considered an urban district. Despite being an urban district, the district has diverse levels of people with different socio-economic status in urban and rural settings. The district covers all three levels of the health care delivery system within the city including the primary, secondary, and tertiary levels. In addition, the HIV prevalence is two times higher in urban areas than in rural areas, 17.4% versus 8.9% (National Statistical Office (NSO) [MDHS] and ICF, 2017; United Nations Program on HIV/AIDS (UNAIDS), 2014).

2.3 Study Population

The study targeted Malawian women living with HIV infection in support groups in Lilongwe District. The study was conducted in both urban and rural areas in Lilongwe District in Malawi. The district HIV prevalence rate is 9.2% and has many HIV support groups dealing with people living with HIV/AIDS (United Nations Program on HIV/AIDS (UNAIDS), 2014). Most HIV support groups were established to support people living with HIV/AIDS to live a quality productive life. They are membership organizations and the members are in all districts of Malawi. For example, the National Association of People Living with HIV/AIDS in Malawi (NAPHAM) was established in 1993 by a small group of PLHIV who observed that their needs were not being met. The organization fights stigma and discrimination, advocates for supportive environments for PLHIV, and facilitates localized support groups for those who are infected and affected by HIV and AIDS. Another organization is the Coalition of Women Living with HIV/AIDS (COWLHA) and it unites different groups of women as a civil society force in dealing with issues on gender and women's rights in the context of HIV and AIDS that impact the lives of women living with HIV and AIDS in Malawi.

2.4 Sampling Method

A two staged proportionate stratified cluster random sampling method was used to select subjects proportionally to the population size of HIV positive women in urban and rural geographical areas and by age group. The inclusion criteria were: HIV positive women in HIV support groups aged 18 and above with a cervix, active members of HIV support organizations, willing to participate in the study, and able to speak Chichewa or English. The exclusion criteria included women who had a total hysterectomy, women with known allergy to acetic acid, and

women who had CC screening before HIV diagnosis.

2.4.1 Sampling Frame: The sampling frame was the HIV Support group registry at the Lilongwe District Aids Coordinating Office that was used to identify all HIV support groups in Lilongwe District. There are six HIV membership support organizations in Lilongwe that support Malawian women living with HIV/AIDs. There are eighty-four support groups, and the membership in each support group varied between 20-100 members. In total, there are over 4,200 HIV-positive women and men in HIV support groups in Lilongwe District and among these members, 3,360 (80%) are women aged 18 and above.

2.4.2 Sample Size: The sample size calculation was estimated by using G-power and sample size calculator based on the prevalence of the outcome variable of interest (Levin & Kanza, 2014). In Malawi, the CC screening coverage for HIV positive women is 15.9% (Msyamboza et al., 2016). Using 15.9% as the maximum expected prevalence of CC screening rate among HIV-positive women, a margin of error equal to 0.05 in 95% confidence interval, a minimum sample size of 206 participants was needed. Considering that 70% would agree to participate in the study and 10% missing data, 291 women meeting the criteria in the selected HIV support groups were invited to participate in the study.

2.5 Recruitment

The population was stratified by geographic location: Urban and Rural of Lilongwe District. Simple random sampling was used to select 10 support groups from the 175 support groups in urban areas and 5 support groups from 116 support groups in rural areas. Recruitment announcements and appointment dates were made during HIV support group meeting days by the expert client or support group coordinator. Data was collected during the support group planned meeting day. All participants meeting the criteria were invited to participate in the study. Volunteers who showed up for participation in the study during the scheduled days were recruited consecutively until the desired sample size for geographical location and age was reached.

The study was approved by international and relevant local IRBs. Informed consent was obtained by the researcher and the trained research assistants (RAs). The data collectors provided a verbal explanation of the study and participants signed an informed consent statement after all their questions about the study were answered to their satisfaction. All eligible women were informed that their decision to participate in this study was not to affect their access to healthcare services. For participants who could not write, a thumb stamp served as a signature. The signed consents were kept in a locked cupboard separate from other records at the study site.

2.6 Measurement

The draft questionnaire was developed based on a literature review (Akinyemiju et al., 2015; Bruwer et al., 2008; Hami et al., 2014; Lee et al., 2015; Malde, M et al., 2015; McCrae et al., 2011; Stewart et al., 2014; UCL, 2011; Willis & Artino, 2013; Zimet et al., 1988) and preliminary qualitative study findings reflecting social context of Malawian women living with HIV infection (Mtengezo & Lee, 2018). The draft was then given to Malawian health providers and HIV support group leaders to assess the adequacy of items that were mentioned as dimensions that should be taken into account in the development of the questionnaires. This input, along with the feedback by dissertation committee members, contributed to the development of the instrument. The developed English instrument was translated into the local language, Chichewa. In Malawi, about 12% of women aged 15-49 have no education and 6 in 10 women have only attended primary education and are not fluent in English (National Statistical Office (NSO) [MDHS] and ICF, 2017). Pre-tests were done by conducting focus group interviews with five HIV positive women and three HIV support group leaders. The culturally and linguistically relevant final instrument, covering six concepts in the proposed Situation Specific Theoretical framework including demographic characteristics, CC screening uptake, knowledge, attitudes, social support networks, and access to health, was developed.

2.7 Data Collection Procedures

A 30 to 45 minute face-to-face interviewer-administered questionnaire was conducted in local Chichewa language or English based on participants' preference by the researcher and the five trained RAs after obtaining women's signature on the informed consent form. Most women could not answer the questions on their own as most of them could not read and write. Therefore, the interviewer read the questions and responses to the questions exactly as they were worded in the questionnaire to the participants to make sure that the participants understood the question and were given time to give a response to the question before proceeding to the next question. The interviewer marked the response to the question on behalf of the respondent.

2.8 Statistical Analysis

Statistical Package for Social Sciences (IBM SPSS) software version 21.0 was used to analyze data. The variables

measured were: Demographic characteristics, CC screening behavior, knowledge, attitudes, social support networks, and access to health care screening services. Univariate analysis was used to describe respondents' data. Bivariate analysis (chi-square and Fisher's exact tests) were used to determine association between independent variables and CC screening status. An overall score was calculated as a sum of correct answers to each subscale. One point was given for each correct response. And no point was given for either an incorrect or not known response. There was no missing data. Then simple and multivariate logistic regression was used to determine factors associated with CC screening uptake among participants. The adjusted Odds Ratios (OR) and their corresponding 95% CI were used to measure the strength of associations. A two-tailed p-value of $\leq .05$ was considered statistically significant.

The whole instrument with 4 subscales: knowledge, attitude, social support network, and access to screening had high internal consistency with a Cronbach's alpha of 0.88.

3. Results

3.1 Socio-demographic Characteristics of the Respondents

The descriptive statistics of the participants are summarized in Table 1. The study approached 291 participants and all women agreed to be interviewed giving a response rate of 100%.

Table 1. Basic Characteristics of the of Respondents

Variable	N=291	(%)
Geographical location		
Rural	116	39.9
Urban	175	60.1
Employment		
Not Employed	281	96.6
Employed	10	3.4
Religion		
Christian	267	91.8
Others	24	8.2
Marital Status		
Married	137	47.1
Divorced/widowed	121	41.6
Single (Never married)	33	11.3
Education Level		
Primary Level	170	58.4
Never attended school	61	21
Secondary level	55	18.9
College	5	1.7
Monthly Family Income		
< \$100	258	88.7
>\$100	33	11.3
Cervical Cancer screening		
No	195	67.1
Yes	96	32.9
After HIV Diagnosis		
Before HIV Diagnosis	15	5.2

	Range	Mean (SD)
Age	18-60	34.81 ± 9.85
Pregnancies	0-15	4.5 ± 2.58
Time since HIV diagnosis (years)	1 to 19	7.16 ± 4.2

The mean age of the respondents was M 34.81, SD = 9.85 (range 18 – 60 years). Slightly below half of respondents were married (47.1%). The majority of the respondents was not employed (96.6%) and had low monthly family income of less than \$100 (88.7%) with a low education level with their highest educational attainment was primary level of education (58.4%) and those who never attended school (21%).

3.2 Cervical Cancer Screening Uptake

As shown in Table 1, the overall results indicated that 96 (32.9%) had CC screening. Out of the 96, only 81 (27.8%) had CC screening after HIV diagnosis and 94 (97.9%) had VIA as a screening method and 2 (2.1%) had both VIA and Pap smear as screening methods.

3.3 Individual Level of Knowledge Regarding Cervical Cancer and Screening

The respondents' knowledge level regarding CC and screening is indicated in Table 2. The cumulative mean score of knowledge of participants about CC and screening was estimated using the mean score as a cut-off point. The total correct scores less than the mean score meant that the women had low levels of knowledge regarding CC and screening.

Table 2. Knowledge about Cervical Cancer and Screening

A. Risk factors of developing cervical cancer = N (%)			
Do you think the following factors may increase the woman's chance of developing cervical cancer?	Overall 291 (%)	Screened 81 (%)	Not screened 210 (%)
Smoking	146(50.2)	42 (51.9)	104 (49.5)
Having many sexual partners	259(89)	79(97.5)	180 (85.7)
Having a sexual partner with many previous sexual partners	259(89)	80 (98.8)	179 (85.2)
Having a sexual partner who is not circumcised	258(88.7)	78 (96.3)	180 (85.7)
Having sex at an early age	242(83.2)	75 (92.6)	167 (79.5)
Having a weakened immune system (because of HIV/AIDS)	267(91.8)	80 (98.8)	187 (89)
Infection with HPV (Human PapillomaVirus)	252(86.6)	79 (97.5)	173 (82.4)
Having sexually transmitted infection	264(90.7)	80 (98.8)	184 (87.6)
Having a family member diagnosed with cancer	152(52.2)	50 (61.7)	102 (48.6)
Inserting traditional medicine into the vagina	260(89.3)	79 (97.5)	181 (86.2)
Taking family planning pills for a long time	165(56.7)	51 (63)	114 (54.3)
Having many children	249(85.6)	71 (87.7)	178 (84.8)
Not going for regular screening	209(71.2)	64 (79)	145 (69)
	Mean ±SD	Mean ±SD	Mean ±SD
Knowledge regarding risk factors	10.25±3.12	11.21±1.66	9.88±3.46

B. Signs and Symptoms of Cervical Cancer = N (%)

Do you think the following are signs and symptoms of cervical cancer?	Overall 291 (%)	Screened 81(%)	Not screened 210 (%)
Vaginal bleeding between periods	258(88.7)	80 (98.8)	178 (84.8)
Menstrual periods that are heavier or longer than usual	261(89.7)	78 (96.3)	183 (87.1)
Vaginal bleeding after the menopause	260(89.3)	76 (93.8)	184 (87.6)
Vaginal bleeding during or after sex	257(88.3)	78 (96.3)	179 (85.2)
Excessive vaginal discharge that smells unpleasant	269(92.4)	81 (100)	188 (89.5)
Vaginal itching or irritation	250(85.9)	73 (90.1)	177 (84.3)
Pain or discomfort during sexual intercourse	262(90)	80 (98.8)	182 (86.7)
Lower back pain	235(80.8)	71 (87.7)	164 (78.1)
Pelvic pain	248(85.2)	77 (95.1)	171 (81.4)
Frequent urination	187(64.3)	59 (72.8)	128 (61)
Unexplained weight loss	176(60.5)	53 (65.4)	123 (58.6)
	Mean \pm SD	Mean \pm SD	Mean \pm SD
Knowledge regarding signs and symptoms	9.15 \pm 2.82	9.95 \pm 1.60	8.84 \pm 3.12
C: Prevention of Cervical Cancer = N (%)			
Can the following actions prevent cervical cancer?	Overall 291 (%)	Screened 81(%)	Not screened 210 (%)
Male circumcision	265(91.1)	80 (98.8)	185 (88.1)
Cervical cancer screening (examining the cervix)	254(87.3)	78 (96.3)	176 (83.8)
Proper and regular condom use	257(88.3)	77 (95.1)	180 (85.7)
HPV Vaccination	240(82.5)	68 (84)	172 (81.9)
	Mean \pm SD	Mean \pm SD	Mean \pm SD
Knowledge regarding prevention of cervical cancer	3.49 \pm 1.05	3.74 \pm 0.61	3.40 \pm 1.16
D: Awareness about Cervical Cancer, screening and HIV = N (%)			
	Overall 291 (%)	Screened 81(%)	Not screened 210 (%)
A woman who is HIV positive should undergo cervical cancer screening at least once per year.	271(93.1)	77 (95.1)	194 (92.4)
A woman who is HIV positive is at higher risk of developing cervical cancer than a woman who is HIV negative.	278(95.5)	80 (98.8)	198 (94.3)
Cervical cancer develops slowly and can be cured if detected early	247(84.9)	75 (92.6)	172 (81.9)
	Mean \pm SD	Mean \pm SD	Mean \pm SD
Awareness regarding cervical cancer and screening	2.74 \pm 0.64	2.86 \pm 0.44	2.69 \pm 0.70
Overall Knowledge Subscale	Mean \pm SD	Mean \pm SD	Mean \pm SD
Knowledge regarding cervical cancer and screening	25.63 \pm 6.35	27.77 \pm 3.03	24.80 \pm 7.07

Scores above the mean score meant that the women had high levels of knowledge regarding CC and screening. Overall, the respondents had a high knowledge level ($M = 25.63$, $SD = 6.35$). However, knowledge level was higher among those who were screened ($M = 27.77$, $SD = 3.03$) than those who were not ($M = 24.80$, $SD = 7.07$) in all areas that were assessed.

3.4 Individual Attitude Regarding Cervical Cancer and Screening

The respondents' attitude level regarding CC and screening is indicated in Table 3. An overall score of attitudes about CC and screening was calculated as the sum of positive responses. The scores less than the mean score were interpreted to mean that the women had a negative attitude regarding CC screening and scores above the mean score, were interpreted to mean that the women have a favorable attitude regarding CC screening.

Table 3. Attitude about Cervical Cancer and Screening N (%)

What is your opinion on these questions	Overall 291 (100)	Screened 81(00)	Not screened 210 (100)
1 Do you fear cervical Cancer screening?	54(18.6)	8 (9.9)	46 (21.9)
2 Do you feel shy to expose your private parts during the procedure to young or male service providers?	49(16.8)	11 (13.6)	38 (18.1)
3 Are you afraid of pain/discomfort during cervical cancer screening procedure?	54 (18.6)	5 (6.2)	49 (23.3)
4 Are you afraid of bleeding during and after cervical cancer screening procedure?	54 (18.6)	6 (7.4)	48 (22.9)
5 Are you afraid of being diagnosed with cervical cancer after undergoing the screening?	45 (15.5)	11 (13.6)	34 (16.2)
	Mean \pm SD	Mean \pm SD	Mean \pm SD
Attitude regarding cervical cancer screening	4.12 \pm 1.33	4.49 \pm 1.04	3.98 \pm 1.41

Overall, the respondents had a positive attitude ($M = 4.12$, $SD = 6.33$). Also, the respondent's positive attitude regarding screening was higher in women who were screened ($M = 4.49$, $SD = 1.04$) than those who were not screened ($M = 3.98$, $SD = 1.41$).

3.5 Social Support Networks

The respondent's social support networks regarding CC and screening are described in Table 4. The individual scores were summed for the total score. The higher the score above the mean indicated higher levels of perceived social support from networks.

Table 4. Social Support Networks

Item	Yes = N (%)		
	Overall 291 (%)	Screened 81(%)	Not screened 210 (%)
Health care providers			
1 Can you share your concerns about cervical cancer screening with a health care provider?	214 (73.5)	65 (80.2)	149 (71)
2 Have health care providers ever counseled (talked to) you about cervical cancer screening?	224 (77)	72 (88.9)	152 (72.4)
Family members			
3 Does your family try to help you with financial support to go for cervical cancer screening?	66 (22.7)	33 (40.7)	33 (15.7)

4	Do you get the emotional help and support you need from your family regarding HIV and cervical cancer screening?	157 (54)	58 (71.6)	99 (47.1)
5	Can you discuss cervical cancer screening with your family?	236 (81.1)	71 (87.7)	165 (78.6)
6	Have your family members ever encouraged you to go for cervical cancer screening?	213 (73.2)	69 (85.2)	144 (68.6)
	Friends			
7	Have your friends ever recommended cervical cancer screening to you?	221 (75.9)	67 (82.7)	154 (73.3)
8	Can your friends provide social support when found (diagnosed) with cervical cancer?	235 (80.8)	69 (85.2)	166 (79)
9	Do you have friends with whom you can share your results of screening (examination)?	268 (92.1)	77 (95.1)	191 (91)
10	Can you encourage your friend to go for cervical screening?	277 (95.2)	79 (97.5)	198 (94.3)
		Mean \pm SD	Mean \pm SD	Mean \pm SD
	Social Support Networks	7.25 \pm 2.45	8.93 \pm 2.21	7.40 \pm 2.71

The respondents had social support networks that influence their screening behavior with a mean (SD) of 7.25 (2.45). However, the respondent's social support network score regarding screening was higher in women who were screened ($M = 8.93$, $SD = 2.21$) than those who were not screened ($M = 7.40$, $SD = 2.71$). The majority, 79 (97.5%), of the women who were screened and 94% of the women who were not screened, indicated that they could encourage a friend to go for cervical cancer screening services. Very few, 66 (22.7%), of the participants indicated that family members tried to help them with financial support, and just above half of the respondents (54%) got emotional support from family members. Family members were not providing all the financial and emotional support that might be needed. The majority of the respondents received their social support from friends.

3.6 Access to Cervical Cancer Screening Services

Respondents' access to CC screening services is presented in Table 5. The overall score for access to health care services regarding CC screening was calculated. The higher the score above the mean indicated easy access to health care services and the scores below the mean indicated difficulties accessing health care services.

Table 5. Women's Access to Cervical Cancer Screening

What are the reasons that best explain why you did not get the examination for cervical cancer?

	N (%)	Not screened 210 (%)
Affordability		
1 No money for transport		99 (47.1)
Availability		
2 Did not know where to go for screening		50 (23.8)
3 Screening sites are far (distance)		68 (32.4)
Accessibility		
4 Previously, I was badly treated		16 (7.6)
5 Long waiting time		49 (23.3)

Accommodation		
6	The health care providers are inadequate	103 (49)
7	There were no equipment and supplies	18 (8.6)
8	I thought I was not sick	66 (31.4)
9	Could not take time off my work/had other commitments/laziness	39 (18.6)
Acceptability		
10	There is no privacy at the clinic	2 (1)
11	Providers are males	10 (4.8)
12	I do not see the reason to go for screening as I am too old/too young	16 (7.6)
		Mean \pm SD
Access to screening		9.86 \pm 1.84

Among the respondents who did not receive screening, almost half (49.0%) indicated that the health care providers were inadequate and had no money to use for transportation to go to a screening site (47.1%). Others indicated long distance to the screening facility (32.4%); thought that they were not sick (31.4%) and some did not know where to go for screening (23.8%), and long waiting time (23.3%).

3.7 Factors Associated With Cervical Cancer Screening Behavior

The odds ratio associated with CC screening behavior for unadjusted and adjusted models are presented in Table 6.

Table 6. Odds Ratio Associated with Screening

	OR (CI) Raw Mode 1	P-value	Adjusted OR Model 2	P-value
Location				
Rural	Reference			
Urban	1.59 (0.92, 2.72)	0.094		
Religion				
Other religion	Reference			
Christian	0.49 (0.16, 1.49)	0.21		
Age				
18-29 years	Reference			
30-60 years	1.12 (0.66, 1.89)	0.676		
Marital Status				
Single	Reference			
Married	1.06 (0.64, 1.77)	0.82		
Education Level				
Never attended/ Primary	Reference			
Secondary/College	1.39 (0.76, 2.57)	0.287		
Employment				

Not Employed	Reference			
Employed	6.53 (1.65, 25.90)	0.008	6.37 (1.32, 30.80)	0.021
Monthly Income				
<\$100	Reference		0.69 (0.27, 1.72)	
>\$100	0.48 (0.23, 1.00)	0.051		0.42
Time since HIV diagnosis (Years)	1.05 (0.99, 1.12)	0.099		
Number of Pregnancies	1.07 (0.97, 1.18)	0.166		
Knowledge	1.12 (1.05, 1.20)	0.001	1.11 (1.03, 1.20)	0.006
Attitude	1.46 (1.09, 1.95)	0.012	1.43 (1.04, 1.97)	0.027
Social Support Network	19.87 (4.54, 86.99)	0.001	6.8 (1.41, 32.76)	0.017

In the unadjusted model 1 of the logistic regression, the likelihood of CC screening was positively associated with employment (OR=6.53; 95% CI: 1.65, 25.90), income (OR=0.48; 95% CI: 0.23, 1.002), knowledge (OR=1.12; 95% CI: 1.05, 1.20), attitude (OR=1.46; 95% CI: 1.09, 1.95), and social support network (OR=19.87; 95% CI: 4.54, 86.99). However, in adjusted full Model 2, employment (OR=6.37; 95% CI: 1.32, 30.80), knowledge (OR=1.11; 95% CI: 1.03, 1.20), attitude (OR=1.43; 95% CI: 1.04, 1.97), and support network (OR=6.8; 95% CI: 1.41, 2.76) were independently associated with CC screening.

4. Discussion

This was the first empirical study to examine the CC screening uptake, the level of knowledge and attitude regarding CC and screening; and to determine factors associated with screening behavior among HIV positive women in Malawi.

4.1 Cervical Cancer Screening Status

The findings from this study, the proportion of women screened after HIV diagnosis was 27.8%. In a study conducted by Msyamboza and colleagues in 2016, the screening rate for HIV-positive women in Malawi was 15.9% (Msyamboza et al., 2016). The screening rate in this study has increased by almost 75% for HIV-positive women. This increase might be due to the fact that this study targeted women living with HIV infection in HIV support groups. The women may have been exposed to health information during their doctor appointments to get their ART drugs in addition to methodological differences including sampling. On the other hand, it can be due to Government efforts in CC prevention strategies of information sharing about screening for CC outlined in the National cervical cancer control strategy 2016-2020 (Ministry of Health, 2015). However, despite HIV-positive women visiting ART clinics regularly to access drugs and the National Cervical Cancer Control Program in Malawi, the screening rate for HIV positive women is still very low. This finding is also in line with literature review study which was conducted in African countries where it was found that the screening rate in HIV-positive women was also low with disparities among SSA countries (Ezechi et al., 2013; Hami et al., 2014; Maree & Moitse, 2014; Ministry of Health, 2017; Msyamboza et al., 2016; Ogunwale et al., 2016). Though the Malawi CC screening guidelines recommend that HIV-positive women should have annual cervical screening, due to its cost

and other priorities, the government has not implemented the policy (World Health Organization, 2010). Malawi is an aid-dependent country with 60% to 80% of its budget financed by external aid (WHO, 2010). Through the provision of antiretroviral therapy from the contributions of international health agencies, the life expectancy for HIV-infected populations has improved significantly in the past three decades. However, this gain has come at the expense of taking ownership or the sustainability of the public health care system in Malawi.

Donor prioritization of funding for HIV/AIDs might cause national health policy to focus solely on this issue and might lead to neglect of other health issues that are not on the priority list of donors. In 2010, the WHO initiated the WHO Package of Essential NCD Interventions which uses an existing health care approach for NCD prevention and control in low resource settings (World Health Organization, 2010). Recently, a pilot program integrating cervical cancer screening with HIV clinics has been implemented in Malawi (Klyn et al., 2021; Pfaff et al., 2018). By taking advantage of HIV-positive women's regular ART treatment visits, incorporating cervical cancer screening into services at HIV clinics is a logical strategy to increase CCS rates. However, it is important to examine the effect of these integrated services on cervical cancer morbidity and mortality.

4.2 Knowledge and Attitude Regarding Cervical Cancer and Screening

The study findings revealed that women had knowledge regarding CC and screening ($M = 25.63$, $SD 6.35$). This is inconsistent with previous studies conducted in Malawi on all women that reported that women had inadequate knowledge regarding CC signs and symptoms, risk factors, and preventive strategies (Maree & Moitse, 2014; Maseko et al., 2015; Mtengezo & Lee, 2018; Munthali et al., 2015). The difference might be due to different study populations as the respondents in this study are Women living with HIV infection who might have had access to information through their ART appointment visits. This finding could also reflect the impact of the Ministry of Health, health promotion messages that HIV positive women receive during their OPD appointment visits and the ongoing mass campaign about cancer and screening services on the radio and by health care providers. Most radio stations and television in Malawi have public service announcements and campaigns for CC screening.

The high knowledge regarding CC and screening indicates that women living with HIV infection are aware of general risk factors and signs and symptoms of CC and more likely to go for screening. Previous studies in Sub-Saharan Africa have indicated that CC screening uptake was associated with knowledge of CC symptoms and preventive measures (Maseko et al., 2015; Munthali et al., 2015; Rosser et al., 2015; Wigfall et al., 2015). In this study, despite women having high knowledge regarding CC and screening, the screening uptake is still low (27.8%). This result might be due to the fact that though women had high knowledge regarding signs and symptoms of CC and screening, almost half of the respondents were not aware that smoking, having a family member diagnosed with cancer, and taking family planning pills for a long time increases the woman's risk of developing cervical cancer. Previous studies in Malawi revealed that lack of knowledge and awareness about risk factors impacted screening uptake (Maseko et al., 2015; Munthali et al., 2015). Additionally, almost half of the respondents were not aware that there is treatment for cervical cancer. This finding is in line with a qualitative study done in Malawi which found that women misunderstood the CC risk factors and were unaware that there is treatment for cervical cancer (Mtengezo & Lee, 2018; Lee et al., 2019). Based on our results, it is suggested that the impact of health promotion messages in the media and at outpatient departments need to be evaluated and that future health messages or campaigns should be more specific and focused on misunderstanding of risk factors as well as clearly being stated as a 'hope for a cure with early identification of cancer.'

The study also showed that the respondents had a positive attitude regarding screening. However, the respondent's attitude score regarding screening was higher in women who were screened ($M = 4.49$, $SD = 1.04$) than those who were not screened ($M = 3.98$, $SD = 1.41$). This could be, the questions were asked to all women who were exposed to VIA procedure or not exposed. For those who did not go for screening, the majority were willing to be screened. Very few women feared the procedure 54 (18.6%). Some women felt shy to expose their private parts. Some were afraid of being diagnosed with cancer; and some were afraid of pain during the procedure. These findings are in line with a study conducted in Malawi (Mtengezo & Lee, 2018). Respondents further indicated that they would be comfortable to be screened by either male or female service providers. This reflects that woman view screening as a health procedure that doctors of either sex can perform. Perhaps the next question should be, "do women want to know if they have Cervical Cancer?"

4.3 Social Support Networks

The study findings revealed that social support networks had a positive effect on CC screening ($M = 7.25$, $SD 2.45$). The respondent's social support networks' score was higher in women who were screened than those who were not screened. This shows that friends, family members and health care providers can facilitate information gathering, emotional, social, and financial support required for decision making regarding screening. This is in line

with a previous study which indicated that social support networks and participation in social activities can influence behavior as there is information sharing and advice relating to behavior change (Rosser et al., 2015; Wigfall et al., 2015). The majority of the participants (95%) indicated that they can encourage their friends in the support group networks to go for CC screening. The importance of social support networks in influencing CC screening behavior cannot be overlooked. The influence of family members and friends for CC screening has been less studied in Sub-Saharan Africa.

4.4 Access to Cervical Cancer Screening Services

Those who did not go for screening, the reasons for not undergoing screening were related to access in terms of affordability, availability, accommodation, accessibility, and acceptability. There are no user fees to access CC services in public and private-not-for-profit health facilities in Malawi, but the screening sites are far and women wait for a long time to be screened. This is in line with other studies conducted in Malawi (Lee et al., 2015, 2019; Maseko et al., 2015). This indicates that screening services are not integrated into HIV services. All HIV-positive women access the ART clinics for their treatment monthly or every three months in health facilities. If the services were integrated, it would lessen frequent hospital visits for preventive services as most women travel long distances to access screening services. Women are unlikely to travel to the clinic just for screening if they are not having signs and symptoms of cancer. This may be a possible reason that women visit the clinic only when they have signs and symptoms of cancer. Health care providers should check and remind the women on follow up screening dates at every ART hospital appointment visit. There is evidence in Kenya that showed that with targeted interventions for HIV-positive women, the screening rate was as high as 84% (Rosser et al., 2015). If we are to promote healthy lives of women with low income and living with HIV infection, opportunistic screening in the community and in health facilities should be encouraged to improve screening uptake. This calls for review of sexual and reproductive health and ART policies to deal with CC screening and follow-ups in all ART sites, health facilities and in the community. On the other hand, the clinics could not accommodate women if they needed screening due to lack of trained health care providers and equipment. In most ART clinics, there is a shortage of CC screening service providers and funding which may have a negative effect on screening uptake. This calls for the provision of CC screening medical supplies and certified CC screening service providers in all ART clinics. There is also a need to train all ART providers on VIA service provision.

4.5 Factors Associated With Cervical Cancer Screening Behavior

The predictors of CC screening among women living with HIV infection in Malawi were: occupation, knowledge, attitude, and social support networks.

The study sample was predominantly women who were not employed (96.6%) and had a low monthly income of less than 100 US dollars. But the logistic regression shows statistically significance between CC screening and employment. This supports the idea that employment is a strong factor for screening as women get paid and can afford transportation to go for screening services. Even though the screening services are free in Malawi, women who are not employed with a low monthly income of less than \$100 cannot afford to pay for transport to go for screening services which are only offered in a few health facilities in Malawi and on different dates from the HIV Clinic appointment dates.

High levels of knowledge and attitude regarding CC and screening in the study is very encouraging. However, the specific knowledge about risk factors like not going for regular screening was low. There were also misconceptions regarding CC screening procedures among respondents which may have contributed to low screening uptake. On the other hand, the high knowledge may also indicate weakness in the closed ended questions as women could just guess responses. There is a need for continued efforts to address women's knowledge and influence women's perceptions regarding CC and screening to promote screening uptake.

In simple logistic regression, the results indicate that the odds of screening were associated with income (OR=0.48; 95% CI: 0.23; 0.23, 1.002), however, in multivariate logistic regression, the odds of screening lost significance. This finding could infer that the trend exists but its influence on screening could not be directly detected in this study. The reasons for protective effects of income on screening needs to be further studied.

5. Study Limitations

The study had methodological limitations which include: The study focused on women enrolled in HIV support groups. This means that women were exposed to health information messages hence increased knowledge regarding CC and screening. Additionally, the sample may not be representative of all HIV positive women in Malawi as a result; the findings cannot be generalized to all HIV positive women in Malawi. For those women who were screened, there was limited data on what or who influenced them to undergo screening. Family stigma and

the role of spouses in screening need to be investigated further. Descriptive correlation design creates a snapshot and results cannot be used to draw inferences about causal relationships between and among the variables. Self-report and social desirability bias is also a potential limitation.

6. Recommendations

The Malawi Ministry of Health vision is to have Malawian women free from cervical cancer (MOH, 2015). If this dream is to be realized, there is a need to have synergistic efforts at a policy level, health facilities, nursing education and research. Future projects to examine the effect of the pilot program of integrated services of VIA on HIV clinics is necessary and if the program is successful, the program could be implemented broadly, especially in rural areas that are long distances from health facilities. The policy level should ensure that adequate resources for CC prevention and control activities are available in all health facilities in the country.

In addition, more CC service providers should be trained. Community advocacy and awareness on the benefits of screening and the disease process should be increased by using existing culture navigators, Village Health Committee and Community Health Action Groups. The training institutions should review pre-service curricula and incorporate CC screening core competencies in nursing and medical curricula. Lastly, the study targeted only women living with HIV infection in support groups, there is a need to have a comparison study for three groups: women living with HIV infection not in support groups, those in support groups, and HIV negative women. Since the instrument was purpose designed, there is a need to validate the instrument and to test the hypothesis (theory) in a larger sample.

7. Conclusion

This was the first empirical study to examine the CC screening behavior, the level of knowledge and attitude regarding CC and screening; and to determine factors associated with screening behavior among HIV positive women in Malawi. Despite frequent visits to ART clinics, and having knowledge and positive attitudes regarding screening among HIV-positive women, screening rates remained low. This means that knowledge and a positive attitude regarding screening did not translate into practice. Efforts are needed to ensure there is evidence-based health education which is specific to the target population and local settings and includes frequently misunderstood risk factors, myths, and emphasizing benefits of screening.

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