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Knowledge, Attitudes and Perceptions Influencing Cervical Cancer Screening among Women in Kitwe District, Copperbelt Province, Zambia

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Abstract

Background: Cervical Cancer is one such a disease that remains with high mortality unless prevented or detected early and managed. It is one of the most common cancers of the child bearing age between 20 and 45 years world over. It is rated as the second most prevalent cancer among women. There is high consensus among various scholars that high quality screening, effective treatment and routine follow-up care are cardinal in helping women. The main objective of the study was to identify the factors influencing cervical cancer screening in Kitwe District, Zambia. **Methods:** An analytical cross-sectional study design was employed that included the use of a researcher-administered questionnaire. Simple random sampling was used to sample 210 participants. Data were analyzed using SPSS version 25 and chi-square test was used to determine associations among variables. Binary logistic regression was used for multivariate analysis. Statistical significance was set at $p < 0.05$ and 95% confidence interval. **Results:** The age of the women enrolled in the study ranged from 20 to 59 years, with a mean age of 30.4 years (SD: 8.36). Majority (46.2%) of the women were aged between 25 to 34 years and the mean age reported for sexual debut among respondents was 19.7 (SD: 4.01) years ranging from 12 to 31 years at first sexual encounter. Almost all (99%) the women were Christians and 42.9% had attained secondary school education. Fifty nine (59%) of the respondents were married and 77.6% had

children. Over three quarters (77.6%) of the respondents were knowledgeable on cervical cancer and screening, majority (61%) of the respondents demonstrated a more positive attitude towards cervical cancer screening, and the overall perception level among study respondents was more positive (71.9%). The findings of the present study indicated that the magnitude of cervical cancer screening was 44.8%. In the binary logistic regression analysis, older age (35 to 44 years: AOR = 10.91, 95% CI: 2.67 - 44.48, p = 0.001; 45 to 59 years: AOR = 10.28, 95% CI: 1.52 - 69.68, p = 0.017, respectively), and having a positive attitude (AOR = 67.5, 95% CI: 15.42 - 295.44, p < 0.001) were independently associated with cervical cancer screening utilization. **Conclusion:** The study has shown that despite women having adequate knowledge, positive attitudes and perceptions, the number of women who had been screened was still low. However, middle aged and older women, and positive attitudes were found to independently influence women to go for cervical cancer screening. Therefore, attempts should be made to reach women who rarely visit health care services, for example, through increasing health campaigns in partnership with other organizations in the area.

Keywords

Knowledge, Attitude, Perceptions, Cervical Cancer, Screening

1. Introduction

The burden of cervical cancer seems low globally but this is largely driven by the statistics from the developed world [1]. In countries like Zambia, the numbers are not impressive. Anecdotal evidence shows a strong link between lack of awareness and not seeking cervical cancer screening. From a study by Nyambe [2], 63.2% had not heard about cervical cancer and 79.3% had not been seen for cervical cancer screening, this study went on to demonstrate a significant relationship between lack of awareness of cervical cancer and the practice of screening. Kitwe District Action Plan (2020) assumes that lack of knowledge is one of the major hindrances of cervical cancer screening. Cervical cancer constitutes a major health problem. This has resulted in serious concerns from policy makers and stakeholders. The concern has been as a result of the fact that cervical cancer is preventable and curable at low and affordable cost with currently available means of treatment but only if detected at an early stage [3]. According to the Ministry of Health [4], Zambia still has a high incidence of cervical cancer compared to other countries with concomitant high mortality affecting women at their prime (25 to 59 years).

Most women are at risk of developing cervical cancer. Unlike many other cancers, cervical cancer is one of the most preventable by both primary and secondary prevention methods. In Zambia, the See-and treat cervical cancer screening program was launched in 2006. Initially, it was only targeted at HIV-positive women before it became available to all women regardless of their HIV status

[5]. To improve coverage, nurses were trained to conduct cervical screening and the electronic cervical cancer control was developed to assist their consultation with health professionals using online and SMS technology [6].

According to Nyambe *et al.* [3], policymakers have indicated that screening rates in Lusaka were low and fear of dying drives screening uptake. The respondents (policy makers, special interest groups and stakeholders) generally agreed that screening uptake was facilitated by having awareness and knowledge. There is high consensus among various scholars that high quality screening, effective treatment and routine follow-up care are cardinal in helping women. Therefore, studies to refine knowledge and why most women maybe shunning the cervical cancer screening are very necessary for decision and policy direction.

Cervical cancer still remains the most common cancer seen at Cancer Disease Hospital (CDH) in Lusaka, comprising approximately 35% of all cancers managed at CDH [4] and accounting for about 30% new cancer cases per year [7]. According to Kitwe DHO records, there were 187,099 women of the child bearing age in Kitwe district. Those captured during cervical cancer screening from 2018 to 2020 were; 7973 in 2018 while in 2019 there were 14,170 women screening and in 2020 there were 11,890 cervical cancer screenings done; with the total for 3 years being 34,033 (2.86% of the population against the 90% set target). Despite all efforts put in place by the government and other stake holders in the prevention of cervical cancer screening programme, Kitwe district has recorded low numbers of women utilizing cervical cancer screening and in addition, many women access the service when the cancer is in an advanced stage. Therefore, this study sought to bring knowledge, attitudes, and perceptions hindering women in the reproductive age from seeking cervical cancer screening services in Kitwe District of the Copperbelt and due to that, it will bring forth the much-needed information on how to improve the utilization of cervical cancer screening services. This will benefit both the public and health systems by delivering the much-needed services and sensitive needs of the women who need them.

2. Materials and Methods

2.1. Study Design and Participants

This was a cross-sectional analytical study which was conducted in selected health facilities in Kitwe District. The study population comprised of women 20 years and above because they are at high risk of developing cervical cancer as the risk of its invasiveness increases with age, occurring between 20 and 55 years of age. The sample size of 383 women was calculated using the Cochran formula.

The inclusion criteria for selection were that the women must be 20 years and above regardless of their screening status, and must have been living in the selected catchment areas for at least 6 months prior to the study period. Simple random sampling method was used in which participants were selected at random from the target populations by using a ruffle to pick them. The health facil-

ities were purposely selected because they are the most densely and centrally situated populated parts of the district.

2.2. Instrument

A validated interviewer administered semi-structured questionnaire based on previous studies was adapted and used to collect data [8]. The semi-structured questionnaire was divided into four parts thus; section A, B, C, and D. Information on the participants' demographic data was collected in section A, in section B data on Knowledge about cervical cancer screening which was classified as adequate or inadequate based on the mean score of 66% on the responses from the 9 knowledge questions. Section C on attitudes towards cervical cancer, section D perception about cervical cancer and section to cervical cancer.

The research instrument was checked for validity by at least two subject matter experts. The content validity was ensured by taking suggestions from experts, advisers and lectures that looked at its relevancy, clarity and consistence to the study. After, the questionnaire was amended according to the suggestions and the corrections according to respondents' answers. Reliability was upheld by using the same instrument to collect data from the respondents and clarifications were done so that they did not misunderstand the questions. To achieve this, a test re-test analysis was employed during the pilot study. A pilot study was carried out on a study sample with similar characteristics with the main study. Data collection was conducted through face to face interview by the researcher. The researcher personally interviewed the respondents and entered all responses.

2.3. Statistical Analysis

Statistical analysis was performed using SPSS (SPSS Inc., Chicago, IL, version 25). All values were expressed as mean ± standard error or as percentages. Each variable was tested for differences between utilization and non-utilization of cervical cancer screening services by univariate statistical methods with significance accepted at $p < 0.05$ (Chi square test, Fisher's test, Student's t test or Mann-Whitney test where appropriate). All variables significant by univariate analysis were included in the multivariate analysis. A pooled multivariate logistic regression analysis was used to test the hypothesis that the study variables used influenced the utilization of cervical cancer screening services. Stepwise logistic-regression analysis was performed selectively to assess the predictors of cervical cancer screening. This analysis resulted in a final prediction model.

2.4. Ethical Consideration

This study was approved by the University of Zambia Biomedical Research Ethics Committee (REF.1771-2021) and the National Health Research Authority in Lusaka, Zambia.

3. Results

3.1. Characteristics of Participants (Table 1)

Out of the targeted sample size of 384, only two hundred and ten (210) women of reproductive age from 20 to 59 were included in the study and analysis. The age of the women enrolled in the study ranged from 20 to 59 years with a mean age of 30.4 years (SD: 8.36). Majority (46.2%) of the women were aged between

Table 1. Sociodemographic profile of women enrolled in the study.

Character	**Response (n)**	**%***
Age group (years)		
17 - 24	58	27.6
25 - 34	97	46.2
35 - 44	40	19
45 - 59	15	7.1
Marital status		
Single	65	31
Married	124	59
Divorced/separated	14	6.7
Widowed	7	3.3
Religion		
Christian	208	99
Hindu	1	0.5
Islam	1	0.5
Education		
None	3	1.4
Primary	30	14.3
Secondary	90	42.9
Tertiary	87	41.4
Have children		
No	47	22.4
Yes	163	77.6
Coitarche		
12 - 15 years	33	16.1
16 - 19 years	74	36.1
20 - 31 years	98	47.8

*Rounded to the first decimal place.

25 to 34 years followed by 27.6% of women aged between 27 to 24 years while 19% were aged between 35 to 44 years and only 7.1% of women were aged above 45 years. More than half of the respondents (59%) were married while less than a third (31%) of women were still single at the time of the study and about a tenth (10%) of the women were either divorced, separated or widowed (6.7% and 3.3%, respectively). Majority (77.6%) of the respondents had children and the remaining 22.4% of the respondents did not have children. Nearly all (99%) of the respondents were Christians with only a percent of them belonging to either the Hindu or Islamic faiths (0.5% and 0.5%, respectively). Nearly half (43.9%) of the respondents had secondary education followed by those who have had attained tertiary education (41.4%) while slightly over a tenth (14.3%) of the respondents had primary level education and only about a percent (1.4%) of the respondents had no education.

The mean age reported for sexual debut among respondents was 19.7 (SD: 4.01) years ranging from 12 to 31 years at first sexual encounter. (Age was collected as continuous variable and categorized during analysis) Sexual initiation was reported in nearly half (47.8%) of the respondents as taking place at the age of 20 to 31 years while 36.1% indicated to have initiated coitus indicated to have initiated coitus at the age of 16 to 19 years and the remaining 16.1% reported sexual initiation at the age of 12 to 15 years. Five women did not yet have their sexual debut at the time of the study.

3.2. Knowledge

The findings revealed that most (82.9%) of the respondents had enough information about cervical cancer screening. Only 17.1% of the respondents disputed the fact. About 70.5% of the respondents agreed that they know of the information about cervical cancer screening from friends and relatives and 29.5% did not. 83.3% stated that they received a lot of information about cervical cancer screening from the health facilities and 16.7% stated otherwise. Three quarters 75.7% of the respondents stated that they receive a lot of information about cervical cancer screening from the media and 24.3% stated otherwise, about 66.2% said that cervical cancer is caused by the human papilloma virus and 33.8%. Sixty percent (60%) of the respondents agreed with the statement that cervical cancer is a malignant disease affecting the neck of the womb greed and 40% did not.

About 62.9% said that they know the risk factors of having cervical cancer and 37.1% said otherwise, 56.2% stated that they know the signs and symptoms of cervical cancer and 43.8% did not know. Approximately 63.3% of the respondents agreed to the statement that cervical cancer can be treated while 36.7% did not agree 67.3% stated that cervical cancer can be prevented and 32.7% did not agree. Most (60.5%) of the respondents stated that had heard about ways of preventing cervical cancer and 39.5% stated the opposite. More than three quarters (76.3%) of the respondents stated that they knew where to go for cervical cancer screening while 23.8% stated the opposite. Overall, more than three quarters (77.6%) of the respondents were knowledgeable on cervical cancer and screen-

ing. Furthermore, the analysis showed an association between higher level of education and knowledgeable about cervical cancer and screening compared to respondents with lower level of education (p = 0.002).

3.3. Attitude

Most (89%) of the respondents agreed with the statement that the statement that cervical cancer screening is important while 21% did not. About 60.5% disagreed with the statement that they went for cervical cancer screening by myself and 39.5% said otherwise. Most (66.2) of the respondents stated that they went for cervical cancer screening at the hospital and 33.8% said they did not. A large percentage of the respondents 61.4% said that they did not go for cervical cancer screening at the clinic on their own and 38.6 did so. Most 81.4% of the respondents agreed with the statement that they would consider going for cervical cancer screening in future and 18.1% didn't. More than two third (70%) of the respondents agreed with the statement that cervical cancer is a common cause of death among cancers in Zambia while 30% did not. About 74.3% of the respondents agreed with the statement that screening helps in the prevention of cervical cancer and 25.4% did not. Nearly three quarters (74.8%) of the respondents stated that they can recommend cervical cancer screening to others while 25.2% otherwise. Overall, majority (61%) of the respondents demonstrated a more positive attitude toward cervical cancer screening. The current study established a significantly associated between the respondents age (p = 0.013), education level (p = 0.001), sexual debut (p = 0.001) and cervical cancer screening.

3.4. Perception

When asked about being at risk of getting cervical cancer, majority (60.5%) of the respondents agreed and 84.8% of them also agreed that cervical cancer was a dangerous disease. Nearly three quarters (71.4%) of the respondents agreed that reproductive aged women were susceptible to develop cervical cancer and over half (56.2%) were open to share about their status on cervical cancer. Over half (56.7%) of the respondents however, did not know people with cervical cancer. The overall perception level among study respondents were positive classified as being positive and negative. Most (71.9%) of the respondents in this study had positive perceptions towards cervical cancer screening and 28.1% had negative perceptions.

3.5. Utilization of Cervical Cancer Screening Services

The findings showed that out of the 210 women enrolled in this study, only 94 (44.8%) reported having ever been screened for cervical cancer in their lifetime, and 116 (55.2%) of the sample had never screened for cervical cancer (**Figure 1**). The results showed that there was a significant association between utilization of screening services and respondent's age (p < 0.001), coitarche (p = 0.021), knowledge level (p < 0.001), attitude (p < 0.001), and perception (p = 0.001) (See **Table 2**).

Table 2. Extent of screening among women's characteristics.

Variable	Ever been screened, n (%)		p-value
	No	Yes	
Age group (years)			
17 - 24	42 (72.4)	16 (27.6)	**<0.001**
25 - 34	58 (59.8)	39 (40.2)	
35 - 44	14 (35)	26 (65)	
45 - 59	2 (13.3)	13 (86.7)	
Marital status			
Single	37 (56.9)	28 (43.1)	0.200
Married	72 (58.1)	52 (41.9)	
Divorced/separated	5 (35.7)	9 (64.3)	
Widowed	2 (28.6)	5 (71.4)	
Religion			
Christian	114 (54.8)	94 (45.2)	0.441
Hindu	1 (100)	0	
Islam	1 (100)	0	
Education			
None	2 (66.7)	1 (33.3)	0.059
Primary	21 (70)	9 (30)	
Secondary	54 (60)	36 (40)	
Tertiary	39 (44.8)	48 (55.2)	
Have children			
No	29 (61.7)	18 (38.3)	0.312
Yes	87 (53.4)	76 (46.6)	
Coitarche			
12 - 15 years	24 (72.7)	9 (27.3)	**0.021**
16 - 19 years	43 (58.1)	31 (41.9)	
20 - 31 years	45 (45.9)	53 (54.1)	
Knowledge			
Inadequate	43 (91.5)	4 (8.5)	**<0.001**
Adequate	73 (44.8)	90 (55.2)	
Attitude			
Negative	78 (95.1)	4 (4.9)	**<0.001**
Positive	38 (29.7)	90 (70.3)	
Perception			
Negative	43 (72.9)	16 (27.1)	**0.001**
Positive	73 (48.3)	78 (51.7)	

When these variables were combined using the logistic regression, the significant independent variables that remained were age (35 to 44 years: AOR = 10.91, 95% CI: 2.67 - 44.48, p = 0.001; 45 to 59 years: AOR = 10.28, 95% CI: 1.52 - 69.68, p = 0.017, respectively), and attitude (AOR = 67.5, 95% CI: 15.42 - 295.44, p < 0.001). This model predicts that the probability of cervical cancer screening increases with advance in age and positive attitude (See Table 3).

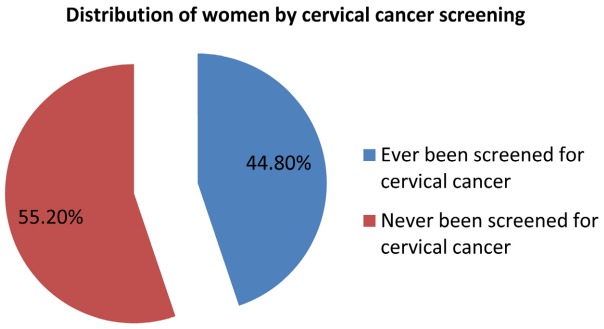

Figure 1. Distribution of women according to extent of cervical cancer screening (n = 210).

Table 3. Factors associated with utilization of cervical cancer screening.

Variable	OR* (95% CI)	p-value	AOR* (95% CI*)	p-value
Age group (years)				
17 - 24	Ref.			
25 - 34	1.77 (0.87 - 3.57)	0.114	1.53 (0.61 - 3.81)	0.363
35 - 44	4.88 (2.05 - 11.62)	**<0.001**	10.91 (2.67 - 44.48)	**0.001**
45 - 59	17.06 (3.46 - 84.19)	**<0.001**	10.28 (1.52 - 69.68)	**0.017**
Coitarche				
12 - 15 years	Ref.			
16 - 19 years	1.92 (0.79 - 4.70)	0.152	0.31 (0.07 - 1.45)	0.136
20 - 31 years	3.14 (1.33 - 7.44)	**0.009**	0.33 (0.07 - 1.55)	0.160
Knowledge				
Inadequate	Ref.			
Adequate	13.25 (4.55 - 38.64)	**<0.001**	2.15 (0.56 - 8.24)	0.264
Attitude				
Negative	Ref.			
Positive	46.18 (15.78 - 135.18)	**<0.001**	67.5 (15.42 - 295.44)	**<0.001**
Perception				
Negative	Ref.			
Positive	2.87 (1.49 - 5.54)	**0.002**	0.61 (0.22 - 1.72)	0.350

*CI = confidence interval; *OR = odds ratios; *AOR = adjusted odds ratios.

Utilisation of cervical cancer screening services among women

Out of the 210 women enrolled in this study, only 94 (44.8%) reported having ever been screened for cervical cancer in their lifetime, and 116 (55.2%) of the sample had never screened for cervical cancer (**Figure 1**).

4. Discussion

The findings of the present study indicated that the magnitude of cervical cancer screening was 44.8%. This finding is high than those found in other low- and middle-income countries; for example, 39% in Botswana [9], 25% in Tanzania [10], and 25% in Kenya [11]. The possible explanation for this high cervical cancer screening utilization could be due to the high level of awareness, improved access to screening services, socio-cultural, socio demographic, and availability of specificity of national cancer prevention and control strategies in Zambia.

The sample comprised of mainly middle-aged women since the study exclusively enrolled women from 20 years and above. The greater proportion of women were married; however, this factor could not have encouraged women to access health services for screening since the services are provided provides an opportunity to protect themselves and their families. This similar to Mwangelwa's [12] study who found over 64% of her sample were married. This can be attributed to the fact that the majority age group in this study was 21 - 40 since this age category consists of adult members of society who by virtue of their age society requires them to be married. The study found that women aged 35 - 59 years were ten times more likely to be screened compared to the women aged 17 - 34 years similar to other studies [13] [14] [15] [16]. The explanation for this could be that individuals would consider being at risk and seeking care after recognizing symptoms and perceiving susceptibility. Women's education is one of the predictors of the practice for cervical cancer screening [17]. Our result; however, did not match the findings from a hospital-based study done in India where higher educational level was independently predictive of cervical cancer screening utilization [18].

The overall knowledge level among respondents in our study was adequate contrary to previous studies conducted elsewhere in Zambia [2] [19]. These results also contradict the findings of a systematic review that reported low levels of awareness and knowledge of cervical cancer in sub-Saharan Africa [20]. However, Belay *et al.* [21] in their study on cervical cancer screening utilization and associated factors among Ethiopian women, reported similar findings to ours that the population had good knowledge about cervical cancer and screening. When a woman's source of information is not a health care provider, there is a potential for her to receive incorrect information. In this study, majority of women received information from health workers contrary to the results from the study by Duffett-Leger *et al.* [22] that women obtain most of their information about the Pap test and cervical cancer from parents and friends, which could explain the misconceptions that other studies have found surrounding

cervical cancer and its screening procedure. It was encouraging to learn that a greater proportion of women received cervical cancer information from the clinics or community health workers.

Women who had a degree/or diploma level of education were more knowledgeable about cervical cancer screening compared with women who did not attend formal education. Our findings confirm the results of a previous study done in Dessie referral hospital and Dessie health centre in northeast Ethiopia [13]. This finding is also supported by a study done in southern Ethiopia by Endalew *et al.* [23] on knowledge and practice of cervical cancer screening among reproductive age grouped women, where it was reported that uneducated/illiterate respondents were 15 times less likely to have good knowledge of cervical cancer screening than those who were educated. This is further supported by the study done in Portland Jamaica [24] and Mexico [25]. This might be due to those uneducated respondents may not have better information about cervical cancer screening. Knowledge has a positive correlation with screening attendance however, failed to serve as a significant predictor of attendance adjusted for other covariates. This is inconsistent with the literature that attribute engagement in a behavior to knowledge. These results are contrary to those found by Rezaie-Chamani *et al.* [26] where a higher level of knowledge is associated with a better likelihood of having attended cervical cancer screening in the past. Other studies [27] [28] also found lacking and incorrect knowledge in their screening non-attenders. This positive relationship between knowledge and screening attendance necessitates the dissemination of information regarding cervical cancer screening that is easily understood and accessed.

Attitude plays an important role in formulating health seeking behaviour. Even in the absence of clinical features, perceived risks may encourage women to go for cervical cancer screening [29]. For instance, more than half (61%) of the respondents had a positive attitude towards cervical cancer screening. This finding is incongruent with a study in Northeast Ethiopia [30] and also this finding is higher than a study done in Cameroon [31] and Zimbabwean [32]. This could be explained by the socio-economic difference between countries. Women with a positive attitude were sixty-eight times more likely to be screened compared to the women with a negative attitude toward cervical cancer screening. This is contrary to a study by Belay *et al.* [21] who failed to demonstrate that women's attitude independently associated with cervical cancer screening utilization. Even though this level of uptake of screening was higher than what was found in similar studies conducted within Africa like Ethiopia at 14.4% in 2016 and South Africa at 15% in 2014 [33] [34], this shows that there is need to intensify educational campaigns on the importance of cervical cancer screening. The study found that 71.4% of the respondents were aware that reproductive aged women were susceptible to develop cervical cancer. This is congruent to other studies done in Ethiopia [35], South Africa [36], Uganda [37] and Nigeria [38]. However, the study contradicts what Aweke *et al.* [39] where they reported that less

than half (43.6%) of the respondents believed that all women are at risk of getting cervical cancer while 37% of them did not know which women are at risk of getting the disease. This could be attributed to low attention given to media promotion, variations in health information provision about cervical cancer and its exposure. In addition, differences in socio-cultural conditions, health education at healthcare facilities and other behavioural change interventions regarding the cervical cancer prevention and control program of Ethiopia and Zambia.

The overall perception level among study respondents was more positive than negative. However, respondents' perception of potential susceptibility to cervical cancer failed to independently predict the chance of screening service utilization. This was inconsistent with study findings in Ethiopia [40] [41] [42]. The inconsistence in the results might be due to differences in the study population *i.e.*, our study mainly sampled women from the outpatient departments while studies from Ethiopia mainly consisted of women in the gynaecology clinics and this could explain the strong relationship between gynaecological problems with cervical cancer and most reproductive problems referred to this unit.

Study Limitations

Our study had several limitations. The major limitations encountered during this study were that, firstly the funding as the student researcher encountered all the costs on her own and as such the scope of the study was limited. Furthermore, time to do the proposal was not enough in that being an academic research it had a fixed deadline on which to submit it thus the research was conducted in a short period of time possibly some details were likely to be left out. Information and selection bias might have occurred as women were recruited from primary health care clinics, so this study might have underestimated women who never sought care and those who normally seek care from other services.

5. Conclusion

This study has shown that women of reproductive age in Kitwe district are well knowledgeable, have positive attitudes and perceptions about cervical cancer screening and prevention. The study has however, shown that despite women having adequate knowledge, positive attitudes and perceptions, the number of women who had been screened was still low. Furthermore, the study showed that there was no significant difference in the influence of knowledge of cervical cancer screening among the respondents on going for screening. However, middle aged and older women, and positive attitudes were found to independently influence women to go for cervical cancer screening. Therefore, attempts should be made to reach women who rarely visit health care services, for example, through increasing health campaigns in partnership with other organizations in the area.

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Conflicts of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

References

[1] Eduardo, S.C. (2016) Factors Influencing Utilization of Cervical Cancer Screening Services in Panama. University of Santa Catarina, Panama City.

[2] Nyambe, A., Kampen, J.K., Baboo, S.K. and Van Hal, G. (2019) Knowledge, Attitudes and Practices of Cervical Cancer Prevention among Zambian Women and men. *BMC Public Health*, **19**, Article No. 208. https://doi.org/10.1186/s12889-019-6874-2

[3] Nyambe, A., Kampen, J.K., Baboo, S.K. and Van Hal, G. (2018) The Impact of the Social Environment on Zambian Cervical Cancer Prevention Practices. *BMC Cancer*, **18**, Article No. 1242. https://doi.org/10.1186/s12885-018-5164-1

[4] Ministry of Health, Zambia. (2015) National Cancer Control Strategic Plan 2016-2021. Ministry of Health of Zambia, Lusaka. http://dspace.unza.zm/handle/123456789/5189

[5] Mwanahamuntu, M.H., Sahasrabuddhe, V.V., Blevins, M., Kapambwe, S., Shepherd, B.E., Chibwesha, C., Pfaendler, K.S., Mkumba, G., Vwalika, B., Hicks, M.L., Vermund, S.H., Stringer, J.S. and Parham, G.P. (2013) Utilization of Cervical Cancer Screening Services and Trends in Screening Positivity Rates in a 'Screen-and-Treat' Program Integrated with HIV/AIDS Care in Zambia. *PLOS ONE*, **8**, Article ID: e74607. https://doi.org/10.1371/journal.pone.0074607

[6] Parham, G.P., Mwanahamuntu, M.H., Sahasrabuddhe, V.V., Westfall, A.O., King, K.E., Chibwesha, C., Pfaendler, K.S., Mkumba, G., Mudenda, V., Kapambwe, S., Vermund, S.H., Hicks, M.L., Stringer, J.S. and Chi, B.H. (2010) Implementation of Cervical Cancer Prevention Services for HIV-Infected Women in Zambia: Measuring Program Effectiveness. *HIV Therapy*, **4**, 703-722. https://doi.org/10.2217/hiv.10.52

[7] Hachipola, M., Mweemba, O. and Sitali, D. (2017) Factors Affecting Accessibility of Cervical Cancer Screening Services for Women with Physical and Sensory Disabilities. *Edorium Journal of Public Health*, **4**, 10-19.

[8] Gilson, L. (2012) Health Policy and Systems Research, a Methodology Reader. World Health Organization, Geneva.

[9] Ibekwe, C.M. (2009) Factors Influencing Cervical Cancer Screening Utilization Among Women Attending Mahalapye District Hospital in Botswana—Use of the Health Belief Model. Dissertation, University of Limpopo, Mankweng. http://hdl.handle.net/10386/227

[10] Kileo, N.M., Michael, D., Neke, N.M. and Moshiro, C. (2015) Utilization of Cervical Cancer Screening Services and Its Associated Factors among Primary School Teachers

in Ilala Municipality, Dar es Salaam, Tanzania. *BMC Health Services Research*, **15**, Article No. 552. https://doi.org/10.1186/s12913-015-1206-4

[11] Murugi, N.A. (2014) Cervical Cancer Knowledge and Screening Utilization among Women in Embu County, Kenya.

[12] Mwangelwa, C. (2019) Knowledge Level of Cervical Cancer Screening Among Women of the Reproductive Age: A Case Study of Chilenje 1st Level Hospital. Cavendish University Zambia, Lusaka.

[13] Andargie, A. and Reddy, P.S. (2016) Knowledge, Attitude, Practice, and Associated Factors of Cervical Cancer Screening among Women in Dessie Referral Hospital and Dessie Health Center, Northeast Ethiopia. *Global Journal for Research Analysis*, **4**, 248-251.

[14] Gan, D.E. and Dahlui, M. (2013) Cervical Screening Utilization and Its Predictors among Rural Women in Malaysia. *Singapore Medical Journal*, **54**, 163-168. https://doi.org/10.11622/smedj.2013047

[15] Gakidou, E., Nordhagen, S. and Obermeyer, Z. (2008) Coverage of Cervical Cancer Screening in 57 Countries: Low Average Levels and Large Inequalities. *PLOS Medicine*, **5**, Article No. e132. https://doi.org/10.1371/journal.pmed.0050132

[16] Mbaka, P., Waihenya, R., Oisebe, C. and Lihana, R. (2018) Factors Affecting the Utilization of Cervical Cancer Screening in Mama Lucy Kibaki Hospital, Nairobi, Kenya. *Cancer Research Journal*, **6**, 106-111. https://doi.org/10.11648/j.crj.20180603.16

[17] Tekle, T., Wolka, E., Nega, B., Kumma, W.P. and Koyira, M.M. (2020) Knowledge, Attitude and Practice towards Cervical Cancer Screening among Women and Associated Factors in Hospitals of Wolaita Zone, Southern Ethiopia. *Cancer Management and Research*, **12**, 993-1005. https://doi.org/10.2147/CMAR.S240364

[18] Bansal, A.B., Pakhare, A.P., Kapoor, N., Mehrotra, R. and Kokane, A.M. (2015) Knowledge, Attitude, and Practices Related to Cervical Cancer among Adult Women: A Hospital-Based Cross-Sectional Study. *Journal of Natural Science, Biology and Medicine*, **6**, 324-328.

[19] Simaubi, M.H. and Ngoma, M.C. (2013) Cervical Cancer Awareness and Uptake of Pap-Smear Services among Women above 18 Years of Age. *Medical Journal of Zambia*, **40**, 19-23.

[20] Perlman, S., Wamai, R.G., Bain, P.A., Welty, T., Welty, E. and Ogembo, J.G. (2014) Knowledge and Awareness of HPV Vaccine and Acceptability to Vaccinate in Sub-Saharan Africa: A Systematic Review. *PLOS ONE*, **9**, Article ID: e90912. https://doi.org/10.1371/journal.pone.0090912

[21] Belay, Y., Dheresa, M., Sema, A., Desalew, A. and Assefa, N. (2020) Cervical Cancer Screening Utilization and Associated Factors Among Women Aged 30 to 49 Years in Dire Dawa, Eastern Ethiopia. *Cancer Control*, **27**, 1-9. https://doi.org/10.1177/1073274820958701

[22] Duffett-Leger, L.A., Letourneau, N.L. and Croll, J.C. (2008) Cervical Cancer Screening Practices among University Women. *Journal of Obstetric, Gynecologic and Neonatal Nursing*, **37**, 572-581. https://doi.org/10.1111/j.1552-6909.2008.00276.x

[23] Endalew, D.A., Moti, D., Mohammed, N., Redi, S. and Wassihun-Alemu, B. (2020) Knowledge and Practice of Cervical Cancer Screening and Associated Factors among Reproductive Age Group Women in Districts of Gurage Zone, Southern Ethiopia. A Cross-Sectional Study. *PLOS ONE*, **15**, Article ID: e0238869. https://doi.org/10.1371/journal.pone.0238869

[24] Ncube, B., Bey, A., Knight, J., Bessler, P. and Jolly, P.E. (2015) Factors Associated

with the Uptake of Cervical Cancer Screening among Women in Portland, Jamaica. *North American Journal of Medical Sciences*, **7**, 104-113. https://doi.org/10.4103/1947-2714.153922

[25] Bingham, A., Bishop, A., Coffey, P., Winkler, J., Bradley, J., Dzuba, I. and Agurto, I. (2003) Factors Affecting Utilization of Cervical Cancer Prevention Services in Low-Resource Settings. *Salud publica de Mexico*, **45**, S408-S416. https://doi.org/10.1590/S0036-36342003000900015

[26] Rezaie-Chamani, S., Mohammad-Alizadeh-Charandabi, S. and Kamalifard, M. (2012) Knowledge, Attitudes and Practice about Pap Smear among Women Referring to a Public Hospital. *Journal of Family and Reproductive Health*, **6**, 177-182.

[27] Behbakht, K., Lynch, A., Teal, S., Degeest, K. and Massad, S. (2004) Social and Cultural Barriers to Papanicolaou Test Screening in an Urban Population. *Obstetrics & Gynecology*, **104**, 1355-1361. https://doi.org/10.1097/01.AOG.0000143881.53058.81

[28] Walsh, J.C. (2006) The Impact of Knowledge, Perceived Barriers and Perceptions of risk on Attendance for a Routine Cervical Smear. *The European Journal of Contraception and Reproductive Health Care*, **11**, 291-296. https://doi.org/10.1080/13625180600841827

[29] Ndejjo, R., Mukama, T., Musabyimana, A. and Musoke, D. (2016) Uptake of Cervical Cancer Screening and Associated Factors among Women in Rural Uganda: A Cross Sectional Study. *PLOS ONE*, **11**, Article ID: e0149696. https://doi.org/10.1371/journal.pone.0149696

[30] Lyimo, F.S. and Beran, T.N. (2012) Demographic, Knowledge, Attitudinal, and Accessibility Factors Associated with Uptake of Cervical Cancer Screening among Women in a Rural District of Tanzania: Three Public Policy Implications. *BMC Public Health*, **12**, Article No. 22. https://doi.org/10.1186/1471-2458-12-22

[31] Ekane, G., Obinchemti, T., Nguefack, C., Nkambfu, D., Tchounzou, R., Nsagha, D., Nkwele, G. and Orock, G. (2015) Pap Smear Screening, the Way Forward for Prevention of Cervical Cancer? A Community Based Study in the Buea Health District, Cameroon. *Open Journal of Obstetrics and Gynecology*, **5**, 226-233. https://doi.org/10.4236/ojog.2015.54033

[32] Mupepi, S.C., Sampselle, C.M. and Johnson, T.R. (2011) Knowledge, Attitudes, and Demographic Factors Influencing Cervical Cancer Screening Behavior of Zimbabwean Women. *Journal of Women's Health*, **20**, 943-952. https://doi.org/10.1089/jwh.2010.2062

[33] Mulatu, K., Motma, A., Seid, M. and Tadesse, M. (2017) Assessment of Knowledge, Attitude and Pratice on Cervical Cancer Screening among Female Students of MizanTepi University, Ethiopia, 2016. *Cancer Biology and Therapeutic Oncology*, **1**, 1.

[34] Hoque, M.E., Ghuman, S., Coopoosmay, R. and Van Hal, G. (2014) Cervical Cancer Screening among University Students in South Africa: A Theory-Based Study. *PLOS ONE*, **9**, Article ID: e111557. https://doi.org/10.1371/journal.pone.0111557

[35] Gedefaw, A., Astatkie, A. and Tessema, G.A. (2013) The Prevalence of Precancerous Cervical Cancer Lesion among HIV-Infected Women in Southern Ethiopia: A Cross-Sectional Study. *PLOS ONE*, **8**, Article ID: e84519. https://doi.org/10.1371/journal.pone.0084519

[36] Hoque, M., Hoque, E. and Kader, S.B. (2008) Evaluation of Cervical Cancer Screening Program at a Rural Community of South Africa. *East African Journal of Public Health*, **5**, 111-116.

[37] Mwaka, M., Orach, C.G., Were, E.M., Lyratzopoulos, G. and Wabinga, H.R.M. (2016) Awareness of Cervical Cancer Risk Factors and Symptoms: Cross-Sectional

Community Survey in Post-Conflict Northern Uganda. *Health Expectations*, **19**, 854-867. https://doi.org/10.1111/hex.12382

[38] Amosu, A.M., Degun, A.M., Babalola, A.O. and Thomas, M.A. (2011) Level of Specific Knowledge, Awareness, Perception, and Screening Behavior Regarding Carcinoma of the Cervix among Rural Women in Iwo Local Government Area, Osun State, Nigeria. *Annals of Biological Research*, **2**, 206-221.

[39] Aweke, Y.H., Ayanto, S.Y. and Ersado, T.L. (2017) Knowledge, Attitude and Practice for Cervical Cancer Prevention and Control among Women of Childbearing Age in Hossana Town, Hadiya Zone, Southern Ethiopia: Community-Based Cross-Sectional Study. *PLOS ONE*, **12**, Article ID: e0181415. https://doi.org/10.1371/journal.pone.0181415

[40] Bante, S.A., Getie, S.A., Getu, A.A., Mulatu, K. and Fenta, S.L. (2019) Utilization of Pre-Cervical Cancer Screening and Associated Factors among Reproductive-Age Women in Debre Markos Town, Northwest Ethiopia, 2017. *BMC Public Health*, **19**, Article No. 1102. https://doi.org/10.1186/s12889-019-7398-5

[41] Bayu, H., Berhe, Y., Mulat, A. and Alemu, A. (2016) Cervical Cancer Screening Service Utilization and Associated Factors among Age-Eligible Women in Mekelle Zone, Northern Ethiopia, 2015: A Community-Based Study Using the Health Belief Model. *PLOS ONE*, **11**, Article ID: e149908. https://doi.org/10.1371/journal.pone.0149908

[42] Gebreegziabher, M., Asefa, N.G. and Berhe, S. (2016) Factors Affecting the Practices of Cervical Cancer Screening among Female Nurses at Public Health Institutions in Mekelle Town, Northern Ethiopia, 2014: A Cross-Sectional Study. *Journal of Cancer Research*, **2016**, Article ID: 4743075. https://doi.org/10.1155/2016/4743075