KNOWLEDGE AND UPTAKE OF CERVICAL CANCER SCREENING AMONG WOMEN IN KIAMBU SUB-COUNTY, KIAMBU, KENYA

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ABSTRACT

Background: **In Kenya, cervical cancer accounts for 12% of all cancer cases and is also the leading cause of cancer deaths. However, evidence on uptake and knowledge levels is limited. It is against this background that this study was carried out.**

Objective: **The study sought to assess knowledge and uptake of cervical cancer screening among women aged 15-54 years in Kiambu sub-County.**

Design: **Analytical cross-sectional study.**

Setting: **Kiambu sub-County in Kiambu Kenya.**

Subjects: **Women aged 15-54 years residing in Kiambu sub-County.**

Main outcome measures: **Age, knowledge, uptake, screening and associated factors.**

Materials and Methods: **An in-person administered questionnaire was used for data collection. Data was analyzed using STATA software to generate descriptive and inferential statistics. Binary logistic regression was used for all bivariable and multivariable analyses to identify factors associated with knowledge on cervical cancer and screening.**

Results: 391 women participated in the study. **Uptake of cervical cancer screening was 101 (25.8%). The majority 315 (80.56%) of the study participants had good knowledge on cervical cancer and screening. Those who had a tertiary level of education (AOR 0.45; 95% CI 0.25-0.81; p=0.01), and being a Muslim (AOR 0.13; 95%**

0.02-0.84; p=0.03) were significantly associated with knowledge on cervical cancer and screening.

Conclusion: **Generally, uptake of cervical cancer screening among women in Kiambu sub-County was low. The knowledge levels on cervical cancer screening were generally good. The factors associated with knowledge on cervical cancer screening included tertiary level of education and being a Muslim.**

INTRODUCTION

Globally, cervical cancer is estimated as the fourth most common cancer among women by the World Health Organization (WHO) [1]. In the year 2022, the WHO reported a global estimate of 660,000 new cases and 350,000 deaths attributable to cervical cancer among women worldwide [1]. Generally, the main cause of cervical cancer is persistent human papilloma virus (HPV) [1-4]. It is estimated that the highest burden of cervical cancer is from Asia, accounting for 58% of all global cases, trailed by Africa in second at 20% [5]. In Africa, studies have shown that the East African region bears the highest burden of cervical cancer[5]. Approximately, cervical cancer is estimated to account for 12% of all forms of cancers in Kenya, but it is the leading cause of deaths [6].

Cervical cancer screening enables early detection of pre-cancerous lesions in the cervix, and thus early initiation of treatment with better prognosis[1]. However, the screening rates are lower than the recommended in most developing nations [7]. For instance, in sub-Saharan Africa, the cervical screening rates are estimated to range from 0.4 to 20% [7], compared to rates of above 60% in the developed world [8]. In Kenya, evidence shows that cervical cancer screening ranges from below 1% to 36% [9], still below the recommended coverage levels of 70% by WHO [10]. Poor knowledge and lack of awareness especially in the developing world are among the key barriers to cervical cancer screening in most developing nations, including Kenya [7].

Good knowledge levels on cervical cancer play a critical central role in influencing uptake of its screening services [11]. However, the actual knowledge levels on cervical cancer and screening in most developing nations is unknown. In Kiambu Kenya, just like many other settings in the country, the actual uptake levels of cervical cancer screening remain unclear. Therefore, the study sought to establish knowledge uptake levels of cervical cancer screening in Kiambu sub-County, Kenya.

MATERIALS AND METHODS

Study design
The study adopted an analytical cross-sectional design to gather information on knowledge and uptake of cervical cancer screening from women aged 15-54 years in Kiambu Sub-County.

Study setting and duration
The study was conducted in Kiambu sub-County in Kiambu County, Kenya. This is one of the most populated counties in Kenya. The County records the third highest number of cancer cases annually after Nairobi and Nakuru Counties [12]. This partly informed the choice of the study site. The data were collected between May to July 2021.

Study population
The study targeted women of reproductive age, who met the following predetermined inclusion and exclusion criteria. For inclusion

women had to; be aged between 15-54 years, be a resident of Kiambu sub-County in the last six months, be willing to participate, give a written consent and be of sound mental state.

Sample size determination and sampling technique

The study sample size was calculated using the Cochran formula [13] as shown below.

$$n_0 = \frac{z^2 pq}{e^2} = n_0 = \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2} = \frac{0.9604}{0.0025}$$
$$= 384$$

In order to account for possible non-response during data collection, the sample size was further adjusted to 400.

The sampling involved inclusion of all the four administrative wards, where a probability proportional to sample size was applied corresponding to the population of the four administrative wards in Kiambu sub-County. Considering that this was a community-based study, this ensured that the study population was representative of the target population from the four administrative wards in the Kiambu sub-County. A list of households with women aged 15-54 years was obtained from the household register the MOH 513 which is the tool used by the community health volunteers (CHVs) for mapping the populations at the household level. The administrative ward with the highest population had the highest number of study respondents. Whereas the study population may have been heterogeneous, having a sample proportionate to the four administrative wards of the Kiambu Sub-County made it sufficient to assess knowledge and uptake of cervical cancer screening.

Data collection

An in-person administered structured questionnaire in either Swahili or English was used for data collection between May to July 2021. The questionnaire was divided into socio-demographics, knowledge and uptake of cervical cancer screening. To ensure validity and reliability, the tool was initially pre-tested among 20 women in Kiambu sub-County, which is within the recommended 5-10%[14,15]. The study validated POWE's fatalism scale which has a section for assessing knowledge and uptake levels[16].

To test for reliability, the researcher used a test-retest method during a pilot study. The scores from both tests were obtained and correlated to obtain reliability co-efficient using the Cronbach's Alpha (α). Cronbach's alpha was computed using SPSS statistical software for analysis. A Cronbach's alpha of 0.713 was obtained and 0.713 for cervical cancer screening items.

Data management and analysis

Initially, data from questionnaires were entered in an MS excel sheet. This was followed by cleaning of the data, which were later exported to the STATA software version 15[17] for analysis. Descriptive statistics for the characteristics of participants were calculated and presented.

The uptake of cervical cancer screening among women of between ages 15-54 years in Kiambu Sub- County was determined as proportion of those who reported to have been screened for cervical cancer. The overall prevalence of cervical cancer uptake was calculated as total participants screened divided by the total population and multiplied by 100.

The knowledge on cervical cancer was measured in a binary scale either true or false. There is no agreed upon cut off criterial for the used knowledge tool ,therefore, basing on rule of the thumb where such cut offs are unknown, the researcher calculated a medium knowledge score and categorized participants as having good knowledge if they had total scores above median and poor knowledge if their scores were same as median or lower [18].

To establish factors associated with knowledge on cervical cancer screening, a binary logistic regression was used. Bivariable regression models were performed for each independent variable. Multivariable analyses were conducted separately for each of the outcomes. Backward stepwise selection was used to identify the most significant variables for the model. The independent variables with a significance level of $p<0.05$ at the multivariable logistic regression were deemed significant predictors of the outcome.

Ethical considerations

The study was reviewed and approved by the ethical review committee of the University of Eastern Africa Baraton (UEAB/REC/04/02/2020). An informed consent was sought from all eligible participants before the start of the interviews. Respondents below the age of 18 gave assent whereas their guardians gave consent on their behalf. Anonymity was observed from data collection, analysis, and archiving to ensure privacy and confidentiality of all study participants.

RESULTS

Socio-demographic characteristics of study participants

Initially, a total of 400 participants met the inclusion criteria. Out of these, 391 completed the questionnaires, representing a response rate of 98% in the study. Slightly above a third 134 (34.53%) of the study participants were aged between 25-34 years, with the minority 61(15.6%) being 45-54 years. A summary of the socio-demographic and socio-economic characteristics is given in Table 1.

Table 1
Socio-demographic and socio-economic characteristics

| Variable	Category	Frequency N (%)
Age	15-24	89(22.76)
	25-34	134(34.53)
	35-44	106(27.11)
	45-54	61(15.6)
Marital status	Married	179(45.78)
	Single	156(39.9)
	Separated /Divorced	29(7.42)
	Widowed	27(6.91)
Number of children; Median (IQR)		3(2-3)
Level of education	None	13(3.32)
	Primary	99(25.32)
	Secondary	185(47.31)
	Tertiary	94(24.04)
Occupation	None	109(27.88)
	Business	92(23.53)
	Formal employment	47(12.02)
	Farming	80(20.46)
	Informal employment	63(16.11)
Income	0	267(70.08)
	0> but < 10,000	65(17.06)
	10-30,000	16(4.2)
	31000 - 50,000	20(5.25)
	51,000 and above	13(3.41)
Religion	Catholic	170(43.7)
	Protestant	203(52.19)
	Muslims	6(1.54)
	Other types (Traditional, Legio Maria, Kanokya)	10(2.57)

Uptake of cervical cancer screening among women the participants

Generally, the uptake levels of cervical cancer screening was 25.8%. By age, slightly above a third 34.9% of the study participants who had cervical cancer screening were aged between 35-44 years, with the minority 21.3% being those 15-24 years as shown in Table 2. By occupation, cervical cancer screening was highest among those who owned businesses and lowest among those who had formal employment as shown in Figure 1.

Table 2

Uptake of cervical cancer screening among women

Variable	Category	Uptake of Screening % (95% CI)
Overall Prevalence of Cancer Screening		25.8(21.7-30.4)
Age	15-24	21.3(14.0-31.2)
	25-34	23.0(16.6-30.9)
	35-44	34.9(26.4-44.5)
	45-54	23.0(14.0-35.3)
Marital status	Married	29.1(22.8-36.2)
	Single	22.4(16.5-29.7)
	Separated /Divorced	31.0(16.8-50.1)
	Widowed	18.5(7.8-38.0)
Level of education	None	23.1(7.2-53.6)
	Primary	22.2(15.1-31.5)
	Secondary	26.5(20.6-33.4)
	Tertiary	28.7(20.4-38.7)
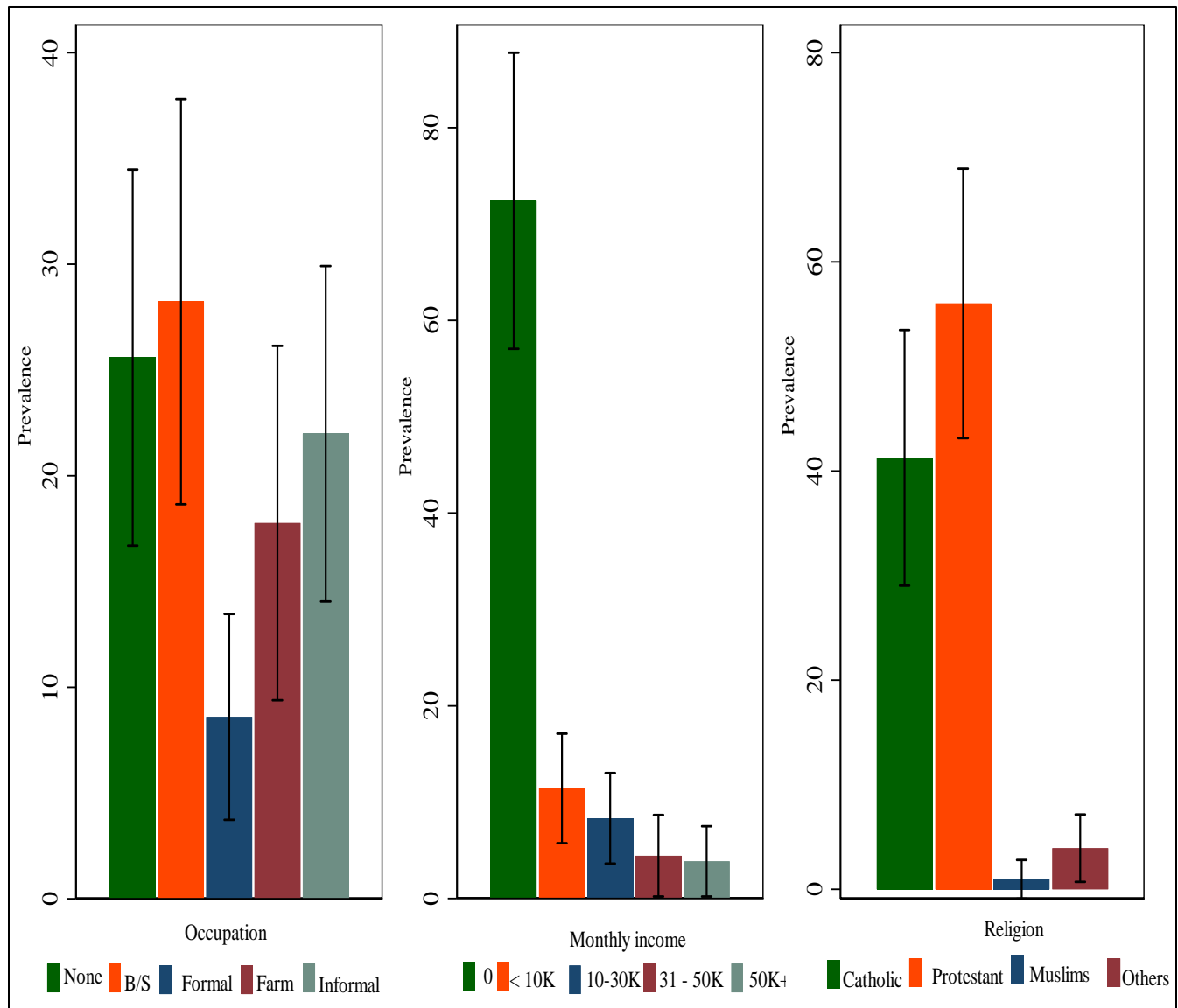
Figure 1. Prevalence of uptake of cervical cancer screening among study participants

Level of knowledge on cervical cancer and screening among women studied In all 80.56% of the study participants had good knowledge on cervical cancer and screening. The assessment of formal education level attained showed that those who had attained secondary school education had the highest proportion of good knowledge on cervical cancer and screening 149(47.3%). Whereas the difference in good and poor knowledge was not statistically significant in all other categories above, there

was statistical significance in the categories of religion registered in the study. A detailed summary of the knowledge levels is given in Table 3.

Factors associated with knowledge on cervical cancer screening among women showed that having attained a tertiary level of education (AOR 0.45; 95% CI 0.25-0.81; p=0.01), and being a Muslim (AOR 0.13; 95% 0.02-0.84; p=0.03) were significantly associated with knowledge of cervical cancer and screening among the

study participants. Those aged 45-54 years of age were 1.62 times more likely to be knowledgeable on cervical cancer and screening. Those who had attained a tertiary level of education were 0.65 times less likely to be knowledgeable on cervical cancer and screening compared to those who had no form of education, whereas the Muslims were 0.87 times less likely to be knowledgeable on cervical cancer and screening compared to the Catholics as shown in Table 4.

Table 3

Knowledge levels on cervical cancer and screening among the studied

Variable	Category	Knowledge Level	
		Poor knowledge	Good Knowledge
Overall level of knowledge		76(19.44)	315(80.56)
Age	15-24	21(27.63)	68(21.59)
	25-34	21(27.63)	114(36.19)
	35-44	17(22.37)	89(28.25)
	45-54	17(22.37)	44(13.97)
Marital status	Married	33(43.42)	146(46.35)
	Single	35(46.05)	121(38.41)
	Separated /Divorced	2(2.63)	27(8.57)
	Widowed	6(7.89)	21(6.67)
Number of children; Median (IQR)		3(2-4)	3(2-3)
Level of education	None	2(2.63)	11(3.49)
	Primary	14(18.42)	85(26.98)
	Secondary	36(47.37)	149(47.3)
	Tertiary	24(31.58)	70(22.22)
Occupation	None	21(27.63)	88(27.94)
	Business	21(27.63)	71(22.54)
	Formal employment	10(13.16)	37(11.75)
	Farming	16(21.05)	64(20.32)
	Informal employment	8(10.53)	55(17.46)
Monthly income	0	45(65.22)	222(71.15)
	0> but < 10,000	12(17.39)	53(16.99)
	10-30,000	3(4.35)	13(4.17)
	31000 - 50,000	5(7.25)	15(4.81)
	51,000 and above	4(5.8)	9(2.88)
Religion	Catholic	40(53.33)	130(41.4-.)
	Protestant	29(38.67)	174(55.41-2.39)
	Muslims	3(4)	3(0.96-87.22)
	Others	3(4)	7(2.23-6.93)

Table 4

Bivariable and Multivariable Logistic Regression Analysis of Factors associated with knowledge on cervical cancer and screening among women aged 15-54 years in Kiambu Sub-County, Kiambu, Kenya

Factors		Bivariable Analysis		Multivariable Analysis	
		Odds Ratio OR (95%CI)	P-Value	Adjusted Odds Ratio AOR (95%CI)	P-Value
Age	15-24	1(Reference)	.	1(Reference)	.
	25-34	1.68(0.85-3.29)	0.13		
	35-44	1.62(0.79-3.3)	0.19		
	45-54	0.8(0.38-1.68)	0.55		
Marital status	Married	1(Reference)	.		.
	Single	0.78(0.46-1.33)	0.36		
	Separated /Divorced	3.05(0.69-13.47)	0.14		
	Widowed	0.79(0.3-2.11)	0.64		
Number of children		1.01(0.85-1.21)	0.89	0	
Level of education	None	1(Reference)	.		.
	Primary	1.1(0.22-5.52)	0.9		
	Secondary	0.75(0.16-3.55)	0.72		
	Tertiary	0.53(0.11-2.57)	0.43	0.45(0.25-0.81)	0.01
Occupation	None	1(Reference)	.	1 (Reference)	
	Business	0.81(0.41-1.59)	0.54		
	Formal employment	0.88(0.38-2.06)	0.77		
	Farming	0.95(0.46-1.97)	0.9		
	Informal employment	1.64(0.68-3.96)	0.27		
Monthly income	0	1(Reference)	.		.
	0> but < 10,000	0.9(0.44-1.81)	0.76		
	10-30,000	0.88(0.24-3.21)	0.84		
	31000 - 50,000	0.61(0.21-1.76)	0.36		
	51,000 and above	0.46(0.13-1.55)	0.21		
Religion	Catholic	1(Reference)	.	1(Reference)	.
	Protestant	1.85(1.09-3.13)	0.02		
	Muslims	0.31(0.06-1.58)	0.16	0.13(0.02-0.84)	0.03
	Others	0.72(0.18-2.91)	0.64		

DISCUSSION

Study results showed that the majority (80.56%) of the study participants had good knowledge of cervical cancer and screening while 25.8% had undergone cervical cancer screening. This shows that there is low levels of uptake of cervical cancer screening considering the knowledge widespread awareness campaigns for women of reproductive age to take the service[19].

The 25.8% uptake of cervical cancer screening is within the national uptake of between <1% and 36% but extremely below the recommended 70% by the WHO [19]. Moreover, the 25.8% uptake of cervical cancer screening is below that of 35.6% established in Kisumu County [9], and 56% established in several other Kenyan settings[21]. This is an indication that cervical cancer screening in Kiambu Sub-county may be lagging compared to other settings in the country.

It emerged that the proportion of women aged 35-44 years had the highest levels of cancer screening at 34.9%. Given that this age group constitutes the upper mid-level reproductive age, it is expected that such women will have had frequent interactions with healthcare providers since the earlier years of their reproductive age. Thus, they will have benefited from awareness campaigns on the need for cervical cancer screening, and ultimately seeking services more compared to younger reproductive age groups. At the earlier ages of their reproductive years, women may not be frequenting healthcare facilities specifically for reproductive health services. Expectedly, such women may not benefit from cervical cancer screening as much as their older counterparts would. Indeed, this is consistent with findings from another study which found that women of a closely similar age cohort (35-49 years) had higher levels of cervical cancer uptake compared to their younger counterparts. Elsewhere, in Kisumu, Kenya, a study found that women aged 45-54 years of age had higher levels of cervical cancer uptake[9]. The cervical cancer screening uptake disparities around age groups are an indication that there may be missed opportunities for such services, especially at earlier ages [22].

Women who owned businesses had the highest levels of cervical cancer screening. This may be attributed to a consistent source of income among such women, which eventually makes them afford cervical cancer screening[23]. However, the levels of cervical cancer screening were lowest among women who had formal employment. The findings of this study are contrary to those of another study that found that cervical cancer screening was higher among women who had formal employment[24].

The study established good knowledge of cervical cancer and screening has been attributed to enhanced uptake of the respective services [25]. Thus, high levels of good knowledge may potentially signify high levels of cervical cancer screening. However, this was not the case in this study. Whereas there were high levels of good knowledge, the screening of cervical cancer in the study population was comparatively lower at 25.8%. Therefore, more studies are needed to understand why good levels of knowledge do not translate to good uptake of cervical cancer screening in this population. The study findings on good knowledge (80.56%) of cervical cancer and screening are similar to those of 80% from a similar study conducted in the larger Kiambu County[26].

The study identified that only having attained a tertiary level of education (AOR=0.45), and being a Muslim (AOR=0.13) were significantly associated with knowledge of cervical cancer and screening among the study participants. Unexpectedly, women who had tertiary education were 0.65 times less likely to be knowledgeable on cervical cancer and screening. This is contrary to existing evidence that knowledge enhances cervical cancer and screening[27,28]. The study established that women of Muslim religion were 0.87 times less likely to have good knowledge of cervical cancer and screening compared to those who were Christians. Studies have shown that

religion may have a role to play in poor knowledge levels of cervical cancer and screening [29,30].

Limitations of the study

The data collection exercise was carried out during the COVID-19 pandemic when there were widespread lockdowns and limited travelling. Thus, the extent of seeking cervical cancer and screening had been adversely affected during this time.

CONCLUSION

Despite good knowledge on cervical cancer screening, the uptake is low. It is recommended that further studies be conducted to establish the know do gap to enhance the uptake of screening for cervical cancer screening in this subpopulation.

REFERENCES

1. WHO. Cervical cancer: WHO fact sheet on cervical cancer, including key facts, causes, prevention and WHO response. [Internet]. 2024 [cited 2024 Mar 29]. Available from: https://www.who.int/news-room/fact-sheets/detail/cervical-cancer

2. Burd EM. Human Papillomavirus and Cervical Cancer. Clin Microbiol Rev. 2003 Jan;16(1):1–17.

3. Awan UA, Naeem W, Khattak AA, Mahmood T, Kamran S, Khan S, et al. An exploratory study of knowledge, attitudes, and practices toward HPV associated anal cancer among Pakistani population. Front Oncol. 2023 Oct 25;13:1257401.

4. Schülein S, Taylor KJ, König J, Claus M, Blettner M, Klug SJ. Factors influencing uptake of HPV vaccination among girls in Germany. BMC Public Health. 2016 Sep 20;16(1):995.

5. Singh D, Vignat J, Lorenzoni V, Eslahi M, Ginsburg O, Lauby-Secretan B, et al. Global estimates of incidence and mortality of cervical cancer in 2020: a baseline analysis of the WHO Global Cervical Cancer Elimination Initiative. The Lancet Global Health. 2023 Feb 1;11(2):e197–206.

6. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. CA Cancer J Clin. 2021 May;71(3):209–49.

7. Mengesha MB, Chekole TT, Hidru HD. Uptake and barriers to cervical cancer screening among human immunodeficiency virus-positive women in Sub Saharan Africa: a systematic review and meta-analysis. BMC Women's Health. 2023 Jun 27;23(1):338.

8. Gakidou E, Nordhagen S, Obermeyer Z. Coverage of cervical cancer screening in 57 countries: low average levels and large inequalities. PLoS Med. 2008 Jun 17;5(6):e132.

9. Choi Y, Ibrahim S, Park LP, Cohen CR, Bukusi EA, Huchko MJ. Uptake and correlates of cervical cancer screening among women attending a community-based multi-disease health campaign in Kenya. BMC Women's Health. 2022 Apr 18;22(1):122.

10. World Health Organisation(WHO). Cervical cancer [Internet]. 2019 [cited 2023 Dec 16]. Available from: https://www.who.int/health-topics/cervical-cancer

11. Gelassa FR, Nagari SL, Jebena DE, Belgafo D, Teso D, Teshome D. Knowledge and practice of cervical cancer screening and its associated factors among women attending maternal health services at public health institutions in Assosa Zone, Benishangul-Gumuz, Northwest Ethiopia, 2022: a cross-sectional study. BMJ Open. 2023 May 1;13(5):e068860.

12. Macharia LW, Mureithi MW, Anzala O. Cancer in Kenya: types and infection-attributable. Data from the adult population of two National referral hospitals (2008-2012). AAS Open Res. 2019 Nov 14;1:25.

13. Cochran WG. Sampling techniques. 3d ed. New York: Wiley; 1977. 428 p. (Wiley series in probability and mathematical statistics).

14. Junyong J. Introduction of a pilot study. Korean J Anesthesiol. 2017 Dec;70(6):601–5.

15. Perneger TV, Courvoisier DS, Hudelson PM, Gayet-Ageron A. Sample size for pre-tests of questionnaires. Quality of Life Research. 2015;24(1):147–51.

16.   Powe BD. Fatalism among elderly African Americans. Effects on colorectal cancer screening. Cancer Nurs. 1995 Oct;18(5):385–92.

17. Stata Statistical Software. Stata | StataCorp LLC [Internet]. [cited 2022 Dec 30]. Available from: https://www.stata.com/company/

18. Cowley LE, Farewell DM, Maguire S, Kemp AM. Methodological standards for the development and evaluation of clinical prediction rules: a review of the literature. Diagnostic and Prognostic Research. 2019 Aug 22;3(1):16.

19.   Mwenda V, Mburu W, Bor JP, Nyangasi M, Arbyn M, Weyers S, et al. Cervical cancer programme, Kenya, 2011–2020: lessons to guide elimination as a public health problem. Ecancermedicalscience. 2022 Aug 26;16:1442.

20. Castanon A, Rebolj M, Pesola F, Pearmain P, Stubbs R. COVID-19 disruption to cervical cancer screening in England. J Med Screen. 2022 Sep;29(3):203–8.

21.   Kemper KE, McGrath CJ, Eckert LO, Kinuthia J, Singa B, Langat A, et al. Correlates of cervical cancer screening among women living with HIV in Kenya: A cross-sectional study. International Journal of Gynecology & Obstetrics. 2022;156(1):151–8.

22. Kinney W, Sung HY, Kearney KA, Miller M, Sawaya G, Hiatt RA. Missed opportunities for cervical cancer screening of HMO members developing invasive cervical cancer (ICC). Gynecol Oncol. 1998 Dec;71(3):428–30.

23.   Biddell CB, Spees LP, Smith JS, Brewer NT, Des Marais AC, Sanusi BO, et al. Perceived Financial Barriers to Cervical Cancer Screening and Associated Cost Burden Among Low-Income, Under-Screened Women. J Womens Health (Larchmt). 2021 Sep;30(9):1243–52.

24.   Black E, Hyslop F, Richmond R. Barriers and facilitators to uptake of cervical cancer screening among women in Uganda: a systematic review. BMC Women's Health. 2019 Aug 9;19(1):108.

25.   Tapera O, Dreyer G, Kadzatsa W, Nyakabau AM, Stray-Pedersen B, SJH H. Cervical cancer knowledge, attitudes, beliefs and practices of women aged at least 25 years in Harare, Zimbabwe. BMC Women's Health. 2019 Jul 8;19(1):91.

26.   Gitonga E, Iseme R, Mutisya R, Kodhiambo M. Cervical cancer knowledge, awareness and related health behaviours amongst women of reproductive age in Kiambu County, Kenya: a cross-sectional study. Health Psychol Behav Med. 2022;10(1):1056–70.

27.   Bansal AB, Pakhare AP, Kapoor N, Mehrotra R, Kokane AM. Knowledge, attitude, and practices related to cervical cancer among adult women: A hospital-based cross-sectional study. J Nat Sci Biol Med. 2015;6(2):324–8.

28.   Alwahaibi N, Alsalami W, Alramadhani N, Alzaabi A. Factors Influencing Knowledge and Practice Regarding Cervical Cancer and Pap smear Testing among Omani Women. Asian Pac J Cancer Prev. 2018;19(12):3367–74.

29.   Afsah YR, Kaneko N. Barriers to cervical cancer screening faced by immigrant Muslim women: a systematic scoping review. BMC Public Health. 2023 Nov 30;23(1):2375.

30.   Padela AI, Peek M, Johnson-Agbakwu CE, Hosseinian Z, Curlin F. Associations between religion-related factors and cervical cancer screening among Muslims in greater chicago. J Low Genit Tract Dis. 2014 Oct;18(4):326–32.