Awareness and Knowledge of Cervical Cancer Screening with the Pap Smear among Women Vising Gynaecological Clinic at the University of Benin Teaching Hospital

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ABSTRACT

Background: Cervical cancer is the most common genital tract malignancy in developing countries. It is one of the few preventable human cancers based on screening, early diagnosis, and treatment of its precancerous lesions. Screening modalities include the Papanicolaouu test (Pap Test), the High-risk Human Papillomavirus (HPV) test, and visual inspection with acetic acid and Lugol iodine. Awareness, Knowledge, and uptake of these various modalities are still poor in our environment. **Methods**: It is a sectional analytical study of women who visited the gynaecological clinic of the University of Benin Teaching Hospital, Benin City. This study aimed to determine the factors associated with awareness and Knowledge of cervical cancer screening with the use of Pap smear. The sample size was determined using the Leslie Kish formula, and 230 participants were recruited for the study. A self-administered structured questionnaire was used to obtain information from the participants. The data were presented in tables and pie charts and analysed using the Statistical Package for Social Science (SPSS) version 22. The associated factors were tested using the Chi-Square, and Fischer exerts, and p values <0.05 were considered significant. **Results**: Out of the 230 respondents, 70% were aware of cervical cancer, but only 43.9% were aware of Pap smear; of the 43.9%, only 19.8% had good Knowledge of Pap smear. The majority of the respondents had their information from health workers. Level of education, marital status and parity were significantly associated with awareness of Pap smear (p < 0.001). However, no sociodemographic factor was significantly associated with Knowledge of Pap smear in the study. **Conclusion**: Awareness and Knowledge of Pap smears is still suboptimal in our environment. Education of the girl child and appropriate dissemination of accurate health information via health staff, mass media, and religious and traditional institutions will help to improve awareness and Knowledge of and acceptance of Pap smear screening tests.

Keywords: Cervical cancer, Pap Smear, Screening, Awareness, Knowledge

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Introduction

Cervical cancer, a malignant disease of the uterine cervix, is the most common genital tract malignancy in developing countries and the fourth most common malignant disease in the females after breast, colorectal and lung cancer worldwide.[1] It is one of the few preventable human cancers based on the early diagnosis and treatment of its precancerous lesions.[1,2] One woman dies of cervical cancer every 2 minutes worldwide, and 80% of these deaths occur in developing countries[2]. In Nigeria, 53.3 million women are estimated to be at risk of developing cervical cancer, with a standardized prevalence of 33.0 per 100,000 women.[2,3] About 70,327 women deaths were attributed to cancer in 2018, and 14.8% of these deaths

were due to cervical cancer, which ranked 2nd most common cancer after breast cancer.[3] Premalignant lesions of the cervix, otherwise known as cervical intraepithelial neoplasia (CIN), are precursor lesions with significant potential of becoming invasive malignant disease.[2] They represent a spectrum of intraepithelial dysplastic changes affecting varying depths of squamous cells lining the ectocervix that may either regress or progress with time.[1,2,3] In most cases, they are asymptomatic and can be detected by various screening methods, such as follow-up cervical biopsy.[2,3]

Cervical cancer screening is the application of a relatively simple, inexpensive test to only asymptomatic persons at risk to detect the premalignant stage of the disease.[3,4] Risk factors for cervical cancer include early coitarche, multiple sexual partners, high parity, immunosuppression, smoking, history of sexually transmitted diseases and high-risk HPV infection.[5] There are various methods postulated for cervical cancer screening, which include the Papanicolaou smear, which has gained much popularity.[6] Other modalities include the visual inspection of the transformation zone with lugol's iodine or acetic acid, Human Papilloma Virus (HPV) DNA testing and colposcopy.[7]

The Papanicolaou smear, popularly known as Pap smear, was invented by George Nicholas Papanicolaou and Aurel A. Babes in 1928 and was generally accepted worldwide in 1941.[25] It is cheap, easy to collect and has a high specificity. The screening modality is readily available and commonly used in low- and middle-income countries.[8,9] However, its use alone is becoming obsolete in the developed countries.[10] The combination of Pap smear and HPV testing is now being recommended and performed in developed countries. HPV DNA testing has the advantage of being more sensitive than Pap smear.[11-13] However, it is more expensive to conduct, hence its limitation of usage in low- and middle-income countries like ours.[14-18]

With the emergence and adequate utilization of these screening modalities, the incidence of cervical cancer has reduced drastically in developed countries.[7,19-24] Unfortunately, this is not the case in low- and middle-income countries like ours, as awareness and Knowledge of these screening modalities are still lacking among a significant portion of the populace in our environment.

This study was designed to identify the determinants of awareness and knowledge of cervical cancer screening with the use of the Pap smear among women who visited the gynaecological clinic of the University of Benin Teaching Hospital. Thus, it will help to modify our protocol to improve the uptake of this screening tool, and subsequently, it will help curtail the menace of cervical cancer in our environment. The aim is to determine the factors associated with awareness and Knowledge of cervical cancer screening with the use of Pap smear among women who visited the gynaecological clinic of the University of Benin Teaching Hospital.

Methods

This is a cross-sectional analytical study of women who visited the gynaecological clinic of the University of Benin Teaching Hospital between April and June 2022. All women visiting the gynaecological clinic for the first time and accepted to participate in the study were recruited. At the same time, those on follow-up declined participation, and those who were less than 21 years old were excluded from the study. The sample size was determined using the Leslie Kish formula, as this was used in a similar previous study in Jos, North Central Nigeria.[7] The prevalence of premalignant and malignant disease of the cervix in a previous study done in Benin using the Pap smear as a screening tool.[10] P=16.2% (0.162). $n = (1.96)^2 \times 0.162 \times 0.838/ (0.5)^2 = 209$ (minimal sample size). An additional 10% of the participants were added to account for possible missing or incomplete data. This was approximated to 21 participants. A total number of 230 participants were recruited for the study. A self-administered structure questionnaire was used to extract information from each eligible participant. Data including sociodemographic characteristics, area of residence, whether urban or rural, awareness of Pap smear and cervical cancer and knowledge base of Pap smear as a screening tool for cervical cancer were extracted. Closed-ended questions to answer yes or no if they know what Pap smear is, when women start screening, frequency of the screening and when to stop were used to assess the Level of Knowledge of Pap smear among the participants and those who answered at least 50% of the questions correctly were considered to have good Knowledge while those who answered less than 50% were considered to have poor Knowledge. The data was analysed using the Statistical Package for Social Sciences (SPSS) version

22. The results were presented in tables and figures. Bivariate and Multivariate analysis was done, and a statistical test was applied using the Chi-Square and Fischer's exact tests for the various factors. A p-value <0.05 was taken to be significant.

Results

TABLE 1. Sociodemographic Characteristics of Respondents

Variable	Frequency (n = 230)	Percentage
Age group (years)		
21 – 30	64	27.8
31 – 40	106	46.1
41 – 50	42	18.3
≥ 51	18	7.8
Mean ± SD	35.5 ± 9.6	
Marital status		
Married	151	65.7
Single	76	33.0
Separated	2	0.9
Divorced	1	0.4
Level of education		
Tertiary	162	70.4
Secondary	54	23.5
Primary	13	5.7
No formal education	1	0.4
Parity		
Para 0	112	48.7
Para 1	18	7.8
Para 2 – 4	81	35.2
Para 5 and above	19	8.3
Area of residence		
Urban	189	82.2
Rural	41	17.8

Nearly half, 106 (46.1%) of respondents were within the age group 31 – 40 years. The mean age was 35.5 ± 9.6 years. About two-thirds, 151 (65.7%) of respondents were married, while the majority, 162 (70.4%), had a tertiary level of education. Nulliparous women accounted for nearly half, 112 (48.7%) respondents. While a vast majority, 189 (82.2%) of respondents resided in urban communities, only 19 (8.3%) were residents in rural communities.

TABLE 2. Awareness of Cervical Cancer and Pap Smears among Respondents

Variable	Frequency (n = 230)	Percentage
Aware of cervical cancer		
Yes	161	70.0
No	69	30.0
Aware of pap smear		
Yes	101	43.9
No	129	56.1
Source of information (n = 101)*		
Health workers	84	83.2
Internet	36	35.6
Media	28	27.7
Family and friends	22	21.8
Religion leaders	6	5.9

*Multiple response

The awareness of cervical cancer and Pap smear among respondents was 70% and 43.9%, respectively. Health workers were the source of information for most respondents (83.2%). More than half (59.2%) of respondents who were aware of cervical cancer were also aware of Pap smear.
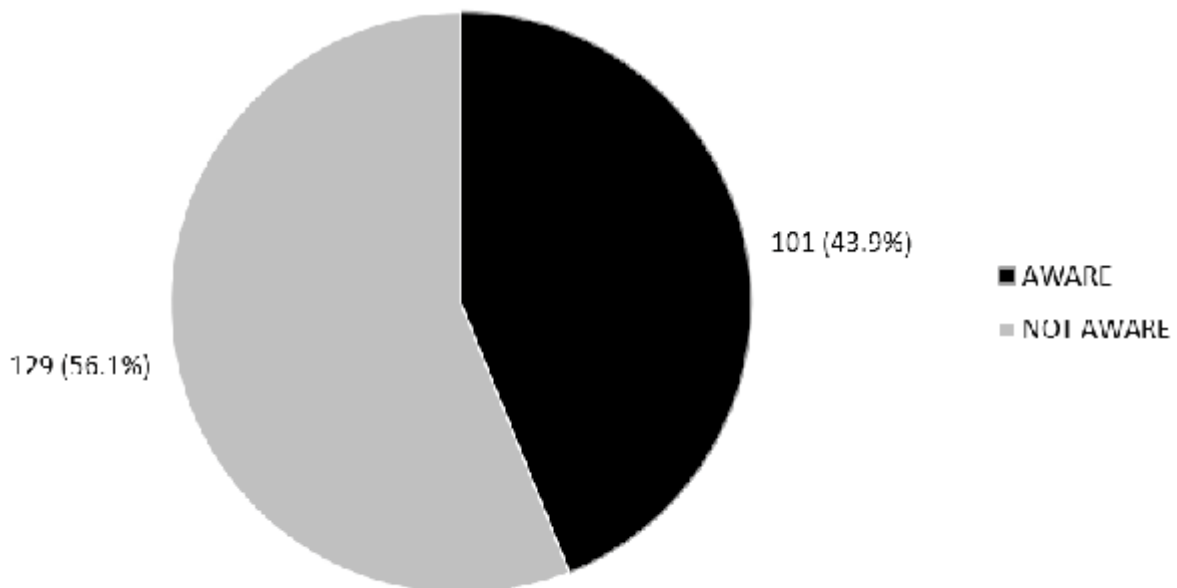

Figure 1: Awareness Of Pap Smear
Less than half, 101 (43.9%) respondents were aware of Pap smear.

Table 3: Association Between Awareness and Sociodemographic Characteristics of Respondents

Variable	Awareness of pap smear		Test statistics	p-value
	Aware (n =101)	Not aware (n = 129)		
	Frequency (%)	Frequency (%)		
Age group (years)				
21 – 30	25 (24.8)	39 (30.2)		
31 – 40	49 (48.5)	57 (44.2)		
41 – 50	19 (18.8)	23 (17.8)		
≥ 51	8 (7.9)	10 (7.8)	$\chi^2 = 0.874$	0.832
Marital status				
Married	70 (69.3)	81 (62.8)		
Single	30 (29.7)	46 (35.6)		
Separated	1 (1.0)	1 (0.8)		
Divorced	0 (0.0)	1 (0.8)	Fischer's exact = 2.009	0.661
Level of education				
Tertiary	85 (84.1)	77 (59.7)		
Secondary	15 (14.9)	39 (30.2)		
Primary	1 (1.0)	12 (9.3)		
NFE	0 (0.0)	1 (0.8)	Fischer's exact = 18.687	**< 0.001**
Parity				
Para 0	38 (36.7)	74 (57.4)		
Para 1	5 (5.0)	13 (10.1)		
Para 2 – 4	51 (50.5)	30 (23.3)		
Para 5 and above	7 (6.9)	12 (9.3)	$\chi^2 = 18.757$	**< 0.001**
Area of residence				
Urban	85 (84.2)	104 (80.6)		
Rural	16 (15.8)	25 (19.4)	$\chi^2 = 0.484$	0.487

Level of education and parity were found to have a statistically significant association with awareness of Pap smear. The Level of awareness increased with an increasing level of education as the highest proportion; 85 (84.1%) of respondents who were aware of Pap smear had a tertiary level of education (**p < 0.001**). Likewise, the awareness of Pap smear also increased with increasing parity as the most significant proportion of 51 (50.5%) of those who were aware of Pap smear had a parity of 2 – 4. In contrast, those with zero parity constituted the highest proportion of respondents unaware of Pap smear (**p < 0.001**).

There was no significant statistical association between age, marital status, and area of residence with Pap smear awareness (p = 0.832, 0.661 and 0.487, respectively).

Table 4: Logistic Regression Model for The Determinants of Awareness of Pap Smear

Predictors	B (regression co-efficient)	Odds ratio	95% CI for OR		p-value
			Lower	Upper	
Age	-0.030	0.971	0.926	1.017	0.210
Marital status					
Married	1.605	0.201	0.087	0.462	**< 0.001**
Single*	1				
Level of education	1.403	4.066	2.182	7.575	**< 0.001**
Area of residence					
Urban	0.023	0.977	0.446	2.142	0.954
Rural*	1				
Parity	0.714	2.042	1.509	2.763	**< 0.001**

*Reference category, R² = 21.6% - 29.0%, CI= Confidence Interval

The model variable accounted for 21.6% – 29.0% of the variation observed in the outcome variable (Awareness of Pap smear). With a year increase in age, the likelihood of being aware of a Pap smear decreased by 0.030. This was more likely due to an odds ratio of 0.971, which was not statistically significant (p = 0.210). Married respondents were 0.201 times more likely to be aware of Pap smears than those who were single. (**CI = 0.087 – 0.462, p < 0.001**). Awareness was found to increase by 1.403 with increasing Level of education as those with a higher level of education were 4.066 times more likely to be aware of Pap smear compared to the preceding Level of education. (**CI = 2.182 – 7.575, p < 0.001**).

Respondents who resided in urban areas were 0.977 times more likely to be aware of Pap smears than those who lived in rural areas (p = 0.954). With increasing parity, the awareness of Pap smears increased significantly by 0.714. This was more likely by an odds ratio of 2.042 (**CI = 1.509 – 2.763, p< 0.001**)

Table 5: Knowledge Of Pap Smear Among Respondents

Variable	Frequency (n =101)	Percentage
Use of Pap smear		
To screen for cervical cancer	77	76.2
Don't know	14	13.9
To screen for STI	6	6.0
To screen for infertility	4	3.9
Category of women to have Pap smear		
All women	72	71.3
Sexually exposed women	16	15.8
Women in reproductive age	11	10.9
Married women only	1	1.0
Menopausal women only	1	1.0
When to start having Pap smear		
Don't know.	56	55.4
From age 15years	20	19.8
From age 25years	18	17.8
After marriage	5	5.0
From age 35years	2	2.0
Frequency of Pap smear		
Don't know	43	42.6
Every 3 – 5 years	41	40.6
Every month	13	12.9
Once in a lifetime	3	2.9
Every 6 – 10 years	1	1.0
When to stop having Pap smear		
Don't know	64	63.4
After age 65	22	21.8
After menopause	9	8.9
When she stops giving birth	4	3.9
After marriage	1	1.0
When she stops having sex	1	1.0

Among respondents who were aware of Pap smear, the majority, 77 (76.2%), stated that it is used to screen for cervical cancer. Meanwhile, 72 (71.3%) opined that all women should undergo a pap smear. Only 16 (15.8%) believed sexually exposed women were the category of women that should undertake a Pap smear. Only 18 (17.8%) opined that women aged 25 should undergo a Pap smear.

More than one-third, 41 (40.6%), stated that Pap smear should be done every 3 – 5 years. While nearly two-thirds, 64 (63.4%), didn't know when to stop undertaking Pap smear, only 22 (21.8%) stated that it should be stopped after age 65 years.

Table 6. Domains Of Knowledge of Pap Smear Among Respondents

Variable	Correct Frequency (%)	Wrong Frequency (%)
Use of Pap smear	77 (76.2)	24 (23.8)
Category of women to undertake Pap smear.	16 (15.8)	85 (84.2)
When to start having a Pap smear	18(17.8)	83(82.2)
Frequency of Pap smear	41 (40.6)	60 (59.4)
When to stop taking Pap smear	22 (21.8)	79 (78.2)

On the use of Pap smear, the majority, 77 (76.2%), gave correct responses, while 85 (84.2%), 60 (59.4%) and 79 (78.2%) responded wrongly to the category of women to be screened, frequency of Pap smear and when to stop taking Pap smear respectively.
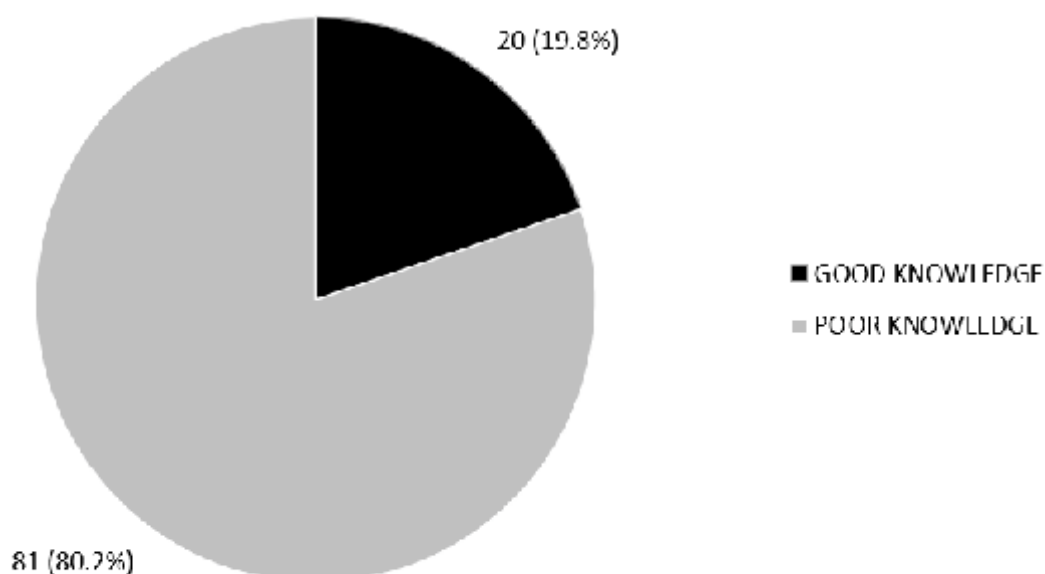

FIGURE 2: Overall, KNOWLEDGE OF PAP SMEAR
Good Knowledge of Pap smear was observed in 20 (19.8%) respondents who were aware of Pap smear.

Table 7: Association Between Knowledge and Sociodemographic Characteristics of Respondents

Variable	Overall, Knowledge of pap smear		Test statistics	p-value
	Good Knowledge (n =20)	Poor Knowledge (n = 81)		
	Frequency (%)	Frequency (%)		
Age group (years)				
21 – 30	5 (25.0)	20 (24.7)		
31 – 40	7 (35.0)	42 (51.9)		
41 – 50	6 (30.0)	13 (16.0)		
≥ 51	2 (10.0)	6 (7.4)	Fischer's exact = 3.010	0.375
Marital status				
Married	14 (70.0)	49 (60.5)		
Single	6 (30.0)	31 (38.3)		
Separated	0 (0.0)	1 (1.2)	Fischer's exact = 0.945	0.685
Level of education				
Tertiary	17 (85.0)	68 (84.0)		
Secondary	3 (15.0)	12 (14.8)		
Primary	0 (0.0)	1 (1.2)	Fischer's exact = 0.521	0.999
Parity				
Para 0	6 (30.0)	32 (39.5)		
Para 1	1 (5.0)	4 (4.9)		
Para 2 – 4	11 (55.0)	40 (49.4)		
Para 5 and above	2 (10.0)	5 (6.2)	χ^2 = 0.825	0.844
Area of residence				
Urban	19 (95.0)	66 (81.5)		
Rural	1 (5.0)	15 (18.5)	χ^2 = 2.199	0.138

There was no significant statistical association between the sociodemographic parameters and Knowledge of Pap smear in this study. The highest proportion, 7 (35.0%) and 42 (51.9%) of respondents with excellent and poor Knowledge, respectively, were within the age of 31 – 40 years (p = 0.375). Similarly, respondents who were married accounted for the most significant proportion, 14 (70.0%) and 49 (60.5%) of respondents with excellent and poor Knowledge, respectively (p = 0.685).

The Level of excellent and poor Knowledge decreased with decreasing Level of education, with respondents with tertiary Level of education having the highest proportions, 17 (85.0%) and 68 (84.0%) of those with excellent and poor Knowledge respectively (p = 0.999).

A higher proportion of respondents, 19 (95.0%) and 66 (81.5%), with excellent and poor Knowledge, respectively, was also noticed among respondents who were residents in urban communities compared to those in rural communities who had

lower proportions 1 (5.0%) and 15 (18.5%) of good and lousy Knowledge respectively (p = 0.138)

Table 8: Logistic Regression Model for the Determinants of Knowledge of Pap Smear

Predictors	B (regression co-efficient)	Odds ratio	95% CI for OR		p-value
			Lower	Upper	
Age	0.043	1.044	0.973	1.121	0.232
Marital status					
Married	0.734	2.083	0.309	14.024	0.607
Single*					
Level of education	0.108	1.114	0.294	4.215	0.874
Area of residence					
Urban	1.411	4.100	0.484	34.735	0.196
Rural*					
Parity	-0.285	0.752	0.417	1.356	0.344

*Reference category, R^2 = 7.7% - 12.2%, CI= Confidence Interval

The variable in the model accounted for between 7.7% – 12.2% of the variation observed in the outcome variable (Good Knowledge). With a year increase in age, the likelihood of having good Knowledge increased by 0.043. This was more likely due to an odds ratio of 1.044, which was not statistically significant (p = 0.232). Married respondents were 2.083 times more likely to have good Knowledge of Pap smear than those who were single. This was also not statistically significant (p = 0.607).

The Level of good Knowledge was found to increase by 0.108 with increasing Level of education

as those with a higher level were 1.114 times more likely to have good Knowledge than the preceding Level of education. This was, however, not statistically significant (p = 0.874).

Respondents who resided in urban areas were 4.1 times more likely to have good Pap smear knowledge than those who lived in rural areas (p = 0.196). With increasing parity, the good Knowledge of Pap smears decreased by 0.285. This was more likely by an odds ratio of 0.752, and it was also not statistically significant (p = 0.344)

Discussion

A good number (70.0%) of the respondents were aware of cervical cancer. However, awareness of Pap smear was poor as only 43.9% of the women were aware of Pap smear. This was higher than the report of a study carried out among the same category of women in Jos (North-Central), where only 11.7% and 4.2% of the respondents were aware of cervical cancer and Pap smear, respectively.[7] The

report was also found to be higher than the study done among market women in Ibadan (South-West), where 40.8% and 19.7% of the respondents were reported to be aware of cervical cancer and Pap smear, respectively.[16] A similar result was reported in Maiduguri (North-East), where 62% and 44.3% of the outpatient attendees were aware of cervical cancer and Pap smear.[20] This insinuated

that awareness of Pap smear is poor across the nation of Nigeria. Similar reports were also reported in other African countries. A study among Gabonese women reported that 27% of participants were aware of Pap smear.[4] However, reports from Asia and Europe are higher. Studies done in Oman and Saudi reported 61.0% and 53.9% of respondents being aware of Pap smear, respectively, while England reported 90.0%.[15,17,24]

A good number (40.8%) of respondents who were aware of cervical cancer were not aware of Pap smear. Again, this is worrisome because preventive measures, including screening for cervical cancer and treatment of the premalignant lesions, are critical factors in its prevention and not just a mere awareness of cervical cancer without being aware of its screening methods.

Though over three-quarters (76.2%) of respondents who were aware of Pap smear could identify its usage as a screening tool for cervical cancer, the overall Knowledge was poor (19.8%). Many respondents exhibit poor Knowledge regarding the category of women to be screened when to start screening, frequency, and when to stop screening. This was as poor, though lower than 28.5% among undergraduate students at the University of Benin.[8] More than half of the respondents were also reported to have poor Knowledge of pap smears in studies done in India, Oman, Saudi Arabia, and Ethiopia [6,15,17]

However, better Knowledge was demonstrated among Latin American (67.7%) and UK (90.0%) women.[22,24] Again, this reflects possible poor socioeconomic status and health information systems peculiar to the regions with poor Knowledge.

The primary source of information among the respondents was health workers (83.2%). The same was noted among undergraduate students at the University of Benin and in Saudi.[8,17]

However, the media was reported as the primary source of information in Jos (North-Central), while friends and family were reported in Ethopia.[23,21]

Perhaps respondents in the study do not often seek information from the media or information about cervical cancer screening is not readily disseminated via the media in the study region. Health information should also be stepped down to the family level and religion gathering as they contribute less to the overall source of information among respondents in the study.

Levels of education and parity were found to be statistically significant factors for awareness of Pap smear, with women of higher levels of education and high parity being more aware of Pap smear than their counterparts of lower education and low parity. This is similar to reports from other parts of Nigeria (Ibadan and Maiduguri), Africa (Cameroun and Ethiopia) and Latin America, where the Level of education was reported to be significantly associated with awareness of Pap smear.[16,18,20-22] Parity was also significant in Ethiopia, though in contrast to findings among Oman women[15,21]. Respondents between 31 and 40 demonstrated better awareness of Pap smear in the study, but not statically significant, similar to the report from Oman. Conversely, studies from Ibadan and Ethiopia found age to be significantly associated with awareness of Pap smear in women aged between 30 and 50 years.[15,16,21] Compared to other studies in Nigeria and Africa, marital status was significantly associated with awareness of Pap smear, with married respondents having good Knowledge compared to the single respondents in the study.[16,18,21] Perhaps this may be due to information sources, such as married and pregnant women visiting the hospital more often than single and non-pregnant ladies. The primary source of information about awareness was health workers in the study.

Respondents who are married, aged between 31 to 40 years, multiparous, who reside in urban areas and had higher education were found to be more knowledgeable than their counterparts who are single, aged less than 31 or more than 40 years, nulliparous, who reside in the rural area and had lower education respectively. Though age, occupation, Level of education, marital status, parity, family income and recent doctor visits have been reported to be significantly associated with Knowledge of Pap smear among Ethiopians, Romanians and Latin American women, no sociodemographic characteristic was found to be statistically significant with Knowledge of Pap smear in the study.[15,21,22]

Conclusion

The uptake of Pap smears in our environment is poor, and this is due mainly to a lack of awareness

and knowledge of cervical cancer screening with the Pap smear. Creating awareness through education of the populace is of paramount importance. Health workers constitute the significant route of disseminating information through counselling. Meanwhile, mass media and religious and traditional institutions could help through advocacy visits. Further, education of the girl child and improvement of socioeconomic status will enhance the Knowledge as well as acceptance of cervical cancer screening, thereby reducing the morbidity and mortality associated with cervical cancer in our society.

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