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NURSING AWARENESS LEVEL OF CERVICAL CANCER AND SCREENING PRACTICES AT THE TERTIARY CARE HOSPITALS, PUNJAB, PAKISTAN

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ABSTRACT

Cervical cancer is the most common cancer among women in Pakistan, primarily linked to the Human Papillomavirus (HPV). Early detection through Papanicolau (Pap) smear screening can identify precancerous lesions, and nurses, as the largest group of healthcare workers, play a critical role in promoting cervical cancer screening. The objective of this study was to assess nurses' awareness of cervical cancer and their personal screening practices at a hospital in Pakistan. A descriptive cross-sectional study was conducted using questionnaires distributed to 137 nurses at the Nishter Hospital, Multan and Jinnah Hospital, Lahore. Data were analyzed using descriptive statistics and chi-square tests.

The results showed that less than half of the nurses had adequate knowledge about cervical cancer. A significant association was found between the knowledge levels regarding the causes of cervical cancer and HPV transmission, with younger nurses demonstrating more adequate knowledge ($p = 0.027$). Knowledge also varied significantly between different nurse cadres, with registered nurses displaying greater awareness compared to enrolled nurses ($p = 0.006$). Most nurses were unaware of appropriate screening intervals, and only a few were informed about the HPV vaccine. Alarmingly, 84.6% of the nurses had never undergone a Pap smear examination themselves. These findings highlight the need for continuous medical education programs and the establishment of cervical cancer prevention policies and strategies within the health sector at all levels.

Keywords: *Cervical cancer, HPV, Knowledge, Nurses*

INTRODUCTION

Cervical cancer is the third major prevalent female cancer below the age of 45 in 146 of 185 countries (Arbyn et al., 2020). According to GLOBOCAN 2020 cancer statistics, 604,000 new cases and 342,000 deaths occurred globally due to cervical cancer (Sung et al., 2021). Approximately 85% of deaths occur in women living in low-income countries because of a lack of awareness and limited access to health services (Hang et al., 2021). This lack of awareness and health services in low-income countries may results in, increased burden/complications of cervical cancer in future. Southeast Asia and the western Pacific, after India and Africa, are some of the global regions having the highest death rates 2.87% of the cervical cancer

deaths happen in underdeveloped countries (Majid et al., 2022).

In Pakistan, cervical cancer is the third most common cancer among women with a reported incidence rate of 5.98% (Sadia et al., 2022). Cervical cancer is one of the cancers that has a precancerous period that can last for years, before invasive disease development, allowing for early detection and treatment so death occurring due to it can be minimized (Manikandan et al., 2019). The major risk factor for cervical cancer is infection with human papillomavirus (HPV). Cervical cancer is commonly related to the HPV-16 and HPV-18 subtypes. Based on known global HPV genotype distribution, it is believed that 100% coverage of HPV vaccines in females with existing vaccines might lower the worldwide incidence of cervical cancer by up to 90% (Athak et al., 2022).

Though it is an avoidable disease owing to a lack of proper screening, prevention, and immunization programs in Pakistan, as high as 70% of women present at a very advanced stage of malignancy, and the mortality rate also remains very high (Parikh et al., 2023). Precise prevalence and incidence of cervical cancer among Pakistani women are not known predominantly due to lack of awareness and proper screening (Jradi & Bawazir, 2019). Accordingly to a study, it ranks the third most common cancer for females in Pakistan and second major prevalent cancer in females between 15 and 44 years in Pakistan (Chughtai et al., 2023).

Morbidity and mortality related to cervical cancer can effectively be reduced by screening and eradicating pre-invasive disease as shown by studies done in developed countries. Studies have shown sensitivity and specificity of Pap smear screening to be 50-75% and 98-99% respectively (Minhas et al., 2020). Despite the availability of screening methods such as pap smears and HPV-DNA testing many women in low income countries do not have access to these services (Bowden et al., 2021). In these countries, visual inspection with acetic acid (VIA) which is a low cost method that does not require specialized know how is being advocated (Tawe et al., 2022). Studies have shown the sensitivity of VIA to be the same as that of Pap smear while its specificity is lower than 85% (Sultana et al., 2019).

Treatment of cervical cancer is dependent on the stage of the disease, age and medical state of the patient, tumor characteristics, patients' preferences and resources within the health sector of each country. Options can be monotherapy or combined; they range from conisation of the cervix, simple hysterectomy with or without lymphadenectomy, radical hysterectomy with pelvic lymphadenectomy, pelvic exenteration, chemotherapy, radiotherapy, to palliative chemotherapy. Treatment at an early stage has the best prognosis with the highest cure rates (Dardiotis et al., 2018). The introduction of the HPV vaccine provides the opportunity to substantially reduce transmission of both high risk types 16, 18 and low risk types 6, 11 by doing so it will reduce not only morbidity and mortality related to cervical cancer, but also the financial burden brought about by diagnosis and treatment interventions (Mawardika et al., 2019). It prevents infections when given to those with no previous exposure. Due to its high cost the vaccine is not available to the public in low income countries like Pakistan (Efua Sackey et al., 2022). This study aim to determine levels of knowledge of transmission of HPV, causes of risks, treatment and prevention of cervical cancer. Furthermore, the association between knowledge and demographic characteristics and to determine the proportion of nurses who had been screened for cervical cancer, as well as the nurses' suggestions for improvement of cervical cancer knowledge.

Research Objective

The objective of this study was to determine awareness of cervical cancer and screening practice among the nurses at the Nishter Hospital, Multan and Jinnah Hospital, Lahore.

Materials and Methods

Study Participants and Procedure

Data collection took place in September 2023 at the Nishter Hospital, Multan and Jinnah hospital, Lahore, Pakistan, which is fully government-funded and has a 1500-bed capacity. The study involved 67 registered and 70 enrolled female nurses from the Obstetrics & Gynecology, Internal Medicine, Surgery, and Pediatrics departments. The sample size of 137 respondents was determined using the Kish and Leslie formula. Participants were selected using a systematic random sampling technique, with registered and enrolled nurses listed alphabetically,

and every other name on the list selected for inclusion. A self-administered questionnaire in Urdu was distributed and collected by the principal investigator during shift changes and tea breaks.

Research Instrument

A self-administered questionnaire was used to collect data on nurses' knowledge of HPV transmission, the causes, risk factors, symptoms, treatment, and prevention of cervical cancer, as well as their own screening practices. The questionnaire was provided in Urdu to ensure accessibility and clarity. Dependent variables were categorized into adequate and inadequate using a scoring system. This study measured nurses' knowledge of HPV transmission, causes, risk factors, symptoms, treatment and prevention of cervical cancer. Nurses' own screening practices was also measured. Continuous variables such as age and work experience (duration of employment) were categorized according to the results of the study. The questionnaire was pre-tested on a group of nurses at a health center, and those who participated in the pre-test were excluded from the main study. Ethical clearance and permission was granted by Hospital Authority. Respondents gave oral consent after the study's objectives were explained, and confidentiality was ensured.

Data Analysis

Data were entered and analyzed using the Statistical Package for Social Sciences (SPSS) version 22. The results were presented in frequency tables and means. Chi-square tests were conducted to determine associations between dependent variables, such as nurses' knowledge of cervical cancer, and independent variables like age and work experience. Statistical significance was set at a p-value of less than 0.05. Dependent variables were categorized into adequate and inadequate knowledge using a scoring system.

Results

Table 1: Demographic characteristics (n = 137)

Variable	Frequency	Percentage
Age (Years)		
Mean ± S.D	44.2 ± 9.3	
Age groups (Years)		
< 30	8	5.8
30 – 40	44	32.1
> 40	85	62.0
Cadre		
Enrolled nurses	70	51.9
Registered nurses	67	48.1
Department		
Ob & Gyn	24	17.5
Medicine	47	34.3
Surgery	36	26.3
Pediatrics	30	21.9
Work experience (Years)		
Mean ± S.D	20.95 ± 10.6	
≤10	26	19.0
11 – 20	38	27.7
> 20	73	53.3

Ob & Gyn = Obstetrics and Gynaecology

A total of 137 respondents were included in this study. The mean age of the participating nurses was 44.2 years (S.D ± 9.3). Nurses aged more than 40 years constituted the majority (62%). Enrolled and registered nurses made up 51.9% and 48.1% respectively of the study sample. The department of Medicine had the largest representation of nurses (34.3%) while the department of Obstetrics and Gynecology had the smallest (17.5%). The mean

duration of working experience was 21 years (S.D±10.6). Nurses with more than 20 years of working experience made up the largest proportion (53.3%) (Table 1).

Table 2: Knowledge of causes, transmission of HPV, risks and symptoms of cervical

	Correct Response (No. / %)	Incorrect Response (No. / %)
Causes		
HPV infection*	53 (38.7%)	84 (61.3%)
Genetic predisposition*	32 (23.4%)	105 (76.6%)
Certain foods	131 (95.6%)	6 (4.4%)
Bacterial infections	103 (75.2%)	34(24.8%)
Transmission		
Sexual intercourse*	83 (60.6%)	54 (39.4%)
Direct genital contact*	38 (27.7%)	99 (72.3%)
Kissing	137 (100%)	0 (0%)
Body fluids	112 (81.8%)	25 (18.2%)
Drinking unsafe water	135 (98.5%)	2 (1.5%)
Mother to child transmission	130 (94.9%)	7 (5.1%)
Air droplets	136 (99.3%)	1 (0.7%)
Variable	**Correct Response (No. / %)**	**Incorrect Response (No. / %)**
Risks		
Smoking*	28 (20.4%)	109 (79.6%)
Alcohol	123 (89.8%)	14 (10.2%)
Multiple sexual partners*	65 (47.4%)	72 (52.6%)
History of HPV infection*	60 (43.8%)	77 (56.2%)
Early sexual debut*	51 (37.2%)	86 (62.8%)
Impaired immunity*	11 (8.0%)	126 (92%)
Use of IUCD	119 (86.9%)	18 (13.1%)
Poor hygiene	136 (99.3%)	1 (0.7%)
Symptoms		
Post coital bleeding*	63 (46%)	74 (54%)
Inter-menstrual bleeding*	13 (9.5%)	124 (90.5%)
Blood stained vaginal discharge*	73 (53.3%)	64 (46.7%)
Fever	134 (97.8%)	3 (2.2%)
Headache	136 (99.3%)	1 (0.7%)
Pelvic pain*	26 (19%)	111 (81%)
Post-menopausal bleeding*	52 (38%)	85 (62%)
Painful coitus*	59 (43.1%)	78 (56.9%)

Respondents were allowed to select more than one option* = correct answer

Table 2 shows knowledge of transmission of HPV, causes, risk factors and symptoms of cervical cancer. HPV infection and genetic predisposition were correctly identified by 38.7% and 23.4% respectively of the nurses as causes of cervical cancer while 95.6% and 75.2% respectively knew correctly that certain foods and bacterial infections were not causes of cervical cancer. Most nurses (60.6%) correctly identified sexual intercourse as a mode of transmission of HPV, while the majority (more than 80.0%) identified kissing, body fluids, drinking unsafe water, mother to child transmission and air droplets as non-modes of transmission. Multiple sexual partners and history of HPV infection was identified by 47.4% and 43.1% respectively as risks for developing cervical cancer by the respondents. The most common symptom of cervical cancer identified was blood stained vaginal discharge (53.3%), followed by post-coital bleeding (46%), painful coitus (43.1%) and post-menopausal

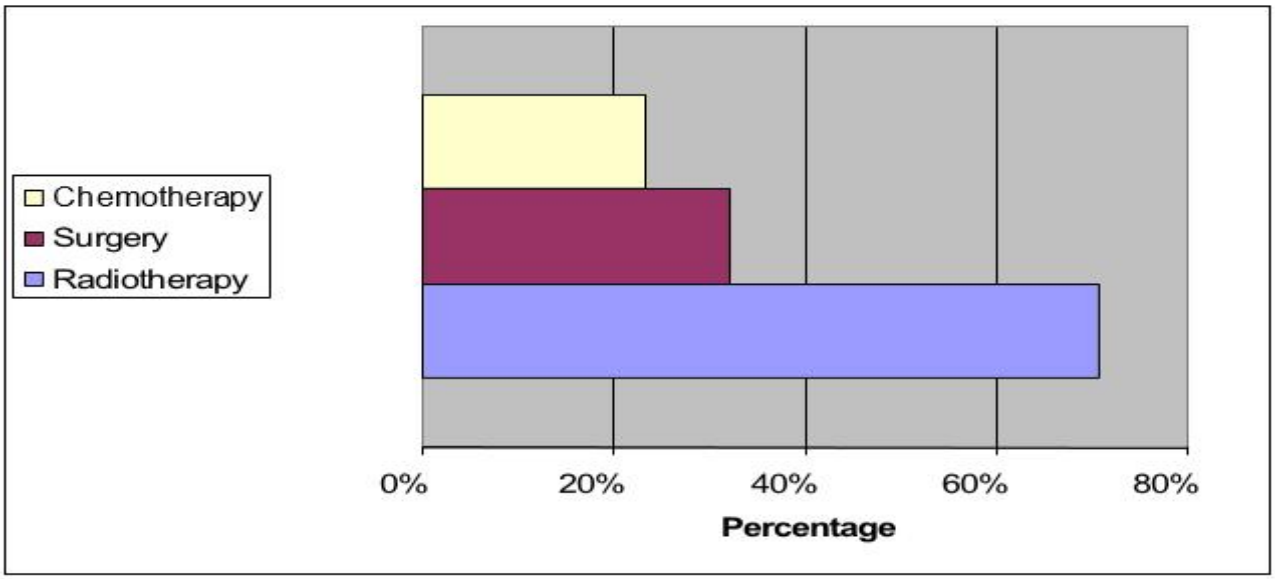
bleeding (38%). Only 19% and 9.5% identified pelvic pain and inter-menstrual bleeding as symptoms.

Table 3: Knowledge of cancer by demographic characteristics among nurses

Variables	n = 137	Knowledge of causes		Knowledge of Symptoms	
		Adequate n (%)	p-value	Adequate n (%)	p-value
Age					
< 30	8	7 (87.5%)		1 (12.5%)	
30 – 40	44	16 (36.4%)		11 (25.0%)	
>40	85	40 (47.1%)	0.027	32 (37.6%)	0.163
Cadre					
Enrolled	70	28 (40.0%)		15 (21.4%)	
Registered	67	35 (52.2%)	0.151	29 (43.3%)	0.006
Department					
OG	24	8 (33.3%)		9 (37.5%)	
Medicine	47	23 (48.9%)		15 (31.9%)	
Surgery	36	17 (47.2%)		10 (27.8%)	
Pediatrics	30	15 (50.0%)	0.587	10 (33.3%)	0.885
Work experience					
≤10	26	15 (57.7%)		6 (23.1%)	
11 – 20	38	17 (44.7%)		13 (34.2%)	
>20	73	31 (42.5%)	0.402	25 (34.2%)	0.548

The participating nurses know correctly causes and transmission in 46%, symptoms in 32.1% and adequate risks in only 7.3 %. More than 80% of nurses aged less than 30 years had adequate knowledge on causes of cervical cancer and transmission of HPV compared to only 36.4% and 47.1% for the 30 - 40 and above 40 age groups respectively (p = 0.027). However, the association with cadre, department and work experience was not significant. There was a significant association between the nurses' cadre and knowledge level of symptoms of cervical cancer; 43.3% of the registered nurses had adequate knowledge of symptoms of cervical cancer compared to only 21.4% of enrolled nurses as indicated in table 3.

Figure 1: Knowledge of cervical cancer treatment options

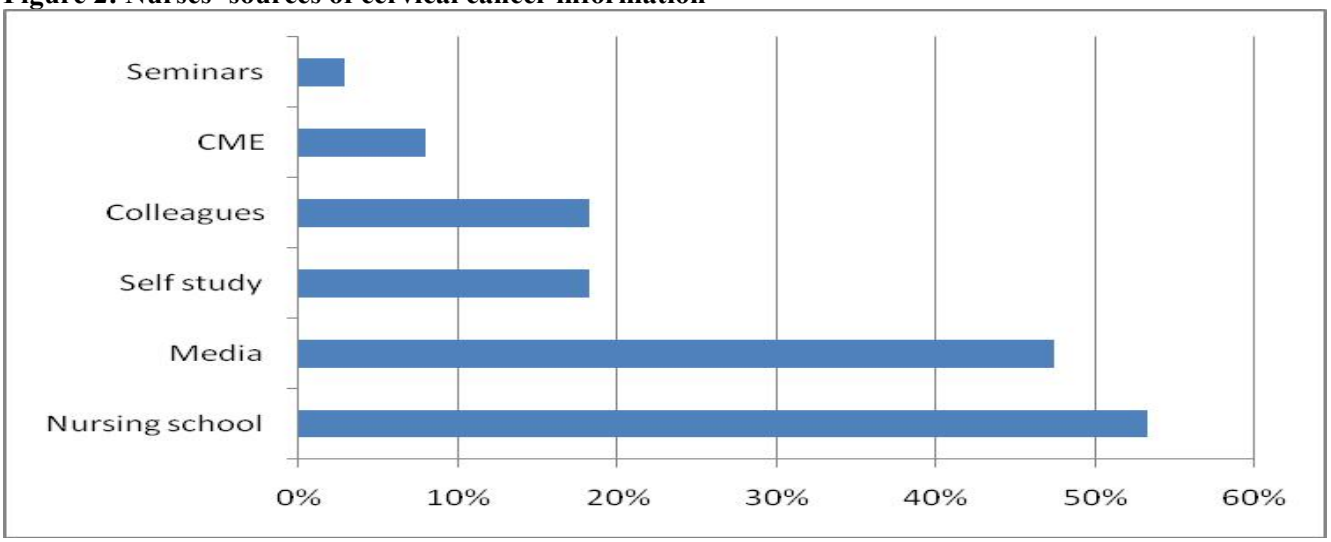


As shown in figure 1, radiotherapy was the most common (70.8%) form of treatment identified by the respondents, followed by surgery (32.1%) and chemotherapy (23.4%) (Figure 1).

Only 31 (22.6%) of the respondents were aware of the HPV vaccine. Of these, 7 (22.6%) knew that vaccination should be done before sexual debut. Other methods of prevention of HPV infection such as condom use and being faithful to one partner were identified by 48.2% and 46.7% respectively of the nurses. Antibiotics were incorrectly identified by 11.7% of the nurses.

Post-menopausal screening was the most widely identified time for screening (40.9%) followed by "after sexual debut" (32.1%) while 7.3% incorrectly identified before sexual debut as the timing for screening. Regarding screening interval 55.5% identified either once between the ages of 35 and 45 or once every 3 to 5 years.

Figure 2: Nurses' sources of cervical cancer information



Nurses were asked for their most recent source of cervical cancer information. Figure 2 shows that nursing school was the most common (53.3%) source of cervical cancer information followed by the media (47.4%). Colleagues and self study were sources of information for 18.2% of the respondents each. Only 2.9% and 8% had attended seminars and continuing medical education sessions on cervical cancer. They responded whether they were satisfied with their knowledge regarding cervical cancer or not. The majority, (83.9%) of the respondents were dissatisfied with their knowledge of cervical cancer, only 16.1% were satisfied.

Nearly half of the respondents (48.2%) were aware of cervical cancer's importance as compared to other cancers affecting women, 17.5% said it was moderately important, 8.8% mildly important and 25.5% did not know. Most (48.9%) of the respondents were aware of the high risk of developing cervical cancer in case of being HPV infected while 51.1% said there is no risk.

Nurses' own cervical cancer screening practices

Most (116/137) of the respondents had never had a Pap smear the most common reason (54.7%) was not knowing where to go for the test, followed by seeing no reason for the test (13.1%), being afraid of the procedure (9.5%) and being afraid of bad results (7.3%). Of the 21 respondents who had a Pap smear test 13 (61.9%) had decided to do so on their own while 8 (38.1%) had been advised by a medical personnel.

Nurses' suggestions for improvements

All respondents suggested more education regarding cervical cancer at the work place. The majority (85.4%) of the respondents suggested that more education at their place of work 5.8% suggested more emphasis should be put on the topic in nursing school and as well as education at the place of work and 8.8% suggested the use of mass media in addition to more education at their place of work.

Discussion

The majority of the nurses in this study had inadequate knowledge of transmission of HPV, causes, risks, symptoms, treatment and prevention of cervical cancer, as has been seen in other studies in India, Nigeria and Uganda (Biancarelli et al., 2020). Regarding causes, less than 40% correctly identified either HPV infection or genetic predisposition. Only two thirds of the nurses identified sexual intercourse as a mode of transmission of HPV. This result is not surprising in a setting where the most commonly known sexually transmitted infections are HIV-AIDS, chlamydia, gonorrhea and syphilis. As a result less than half of the nurses knew that condom use and being faithful to one partner can prevent HPV infection.

A large proportion of the nurses had inadequate knowledge of risks similar to nurses in India (Chatterjee et al., 2016). This is in contrast to findings by Roychowdhury et al in the United States in a study on nurse practitioners who knew most of the risk factors such as multiple sexual partners, history of HPV infection and sexual intercourse at an early age (Roychowdhury et al., 2020. Impaired immunity was identified by 8% of the nurses. This is a poor result given that there is evidence linking cervical cancer to HIV infection more importantly so in a country where HIV prevalence is estimated to be 8% (Sultana et al., 2019).

The most widely identified symptom was blood stained vaginal discharge by approximately half of the nurses. Post-coital bleeding, painful coitus and post-menopausal bleeding were identified by less than half of the nurses. The inability of these nurses to identify most of the symptoms can be due to shortage of health workers, the nurse patient ratio in Pakistan is approximated to be 1:23,000. As a result, work overload prevents the nurses from spending enough time with individual patients and knowing their symptoms (Khan et al., 2021). Most of the nurses were not aware of the recommended pap smear screening interval, similarly in Uganda in a study done among hospital workers found that less than half of them had adequate knowledge regarding screening interval as found by Manikandan et al., (2019). These results are a reflection of the fact there is no screening policy set by the ministry of health or locally at the hospital. In most hospitals in the country where Pap smear screening services are available, the test is carried out by doctors.

Only a few of the few nurses who were aware of the existence of a vaccine for HPV knew when the vaccine is supposed to be given. In comparison, more than 90% of nurses in a study done among Canadian nurses knew that the vaccine should be given before girls become sexually active (Parikh et al., 2023). These results could be explained by the level of education of these nurses, most of whom have diplomas and certificates in nursing as compared to those in a study in India by Swarnapriya et al the majority of whom had bachelor's degrees whereby higher proportions of nurses correctly identified causes, transmission, symptoms, treatment and prevention (Swarnapriya et al., 2015).

Nursing school was a major source of information for many nurses in this group of nurses whose mean duration of work experience is about 20 years. This reflects the inadequacy of the information given in nursing school and raises concern about the fact that only a small percentage had been to seminars or continuing education sessions (Tawe et al., 2022).

Given the shortage of health workers at the hospital, it is not surprising that only a few cited self study as their source of information (Dardiotis et al., 2018). Despite the presence of a small library at the hospital their duties during working hours do not allow spare time to be utilized in the library reading. The type of literature available at the library might also be a factor as most of the books are old medical text books meant for doctors which might not be easy for the nurses to read.

There was also a significant association between nursing cadre and knowledge of symptoms, registered nurses were more knowledgeable than enrolled nurses. This might be due to the differences in the content of nursing curricula between the two cadres, but also surprising due to the fact that they are exposed to the same patients and responsibilities in the wards. The importance of level of education is again supported by findings by Karasu et al in a group of more qualified nurses (Karasu et al., 2019). The lack of a significant association between knowledge levels and department can be explained by the fact that nurses at the hospital rotate between departments at least once every one to two years. In Nigeria however, different health workers, medical

doctors and medical literature were the most commonly mentioned sources of information about Pap tests, only a few cited the media in a study by Mofolo et al. (2018).

The need for further education regarding cervical education is echoed by the nurses' dissatisfaction with their knowledge. The majority cited education at the place of work in the form of seminars and continuing medical education sessions when asked for suggestions for improvement of their cervical cancer knowledge. Despite the small proportion of nurses who had had a Pap smear test, almost half of them considered cervical cancer to be of high public health importance. In a study conducted in Nigeria where 93% of respondents including doctors, nurses and hospital maids had never had the test (Dozie et al., 2021). This again highlights the absence of a screening policy as well as a lack of awareness of the public health importance of cervical cancer among nurses. In Uganda, Mwaka et al found that the respondents' reasons for not being screened were not feeling at risk, lack of symptoms, carelessness, fear of vaginal examination, lack of interest, test being unpleasant and not yet being of risky age (Mwaka et al., 2016). Dahiya et al, show that the majority (89.2%) of those who had never had a Pap test did not feel at risk of developing cervical cancer (Dahiya et al., 2019).

Results from this study as well as those done in Pakistan, India, Uganda and Nigeria indicate that the utilization of screening services is dependent on an individual's awareness of the importance of cervical cancer screening as well as the ability of the health sector to make these services available and accessible (Kadian et al., 2021). From a health belief model and conceptual framework one can deduce the hypothesis that the nurses' screening practices are influenced by their perception of their own susceptibility to the disease, their regard of the public health importance of the disease, benefit of screening and barriers to screening which are in turn influenced by their knowledge about the disease (Obol et al., 2021). As a result and in support of the health belief model, only a small proportion of the nurses had had a Pap smear. The significant association found between knowledge levels and socio-demographic factors (age and nursing cadres were significantly associated with knowledge) shows that not only do demographic characteristics and knowledge influence perceptions and utilization of screening services, they also influence each other (Heena et al., 2019). This hypothesis is supported by findings by Majid et al in a study where results showed that female nursing students who had higher mean knowledge scores were more likely to have had a Pap smear test a year prior to the study compared to those who had not (Majid et al., 2022).

Nurses in high income countries play a role in cancer prevention and participate in cervical cancer screening by carrying out Pap smear tests (Getaneh et al., 2021) due to the lack of logistics and scarcity of gynecologists and pathologists in Pakistani' nurses could be used effectively in the prevention of cervical cancer, by being enabled to perform Pap smear tests and using the visual inspection by acetic acid technique which is less costly and does not require high expertise (Ozturk et al., 2024). The data from this study is from one hospital therefore the results cannot be generalized to nurses in other health facilities in the country.

These results call for creation of health promotion and disease prevention policies as well as awareness campaigns and screening programs at all levels of the health sector. Integration of screening services into already existing programs, such as family planning and reproductive health services, would be an effective strategy in an already financially and human resource challenged health sector.

Conclusion

In Pakistan like in most developing countries nurses are the majority of health personnel. It is important that they are well educated regarding cervical cancer, due its public health importance in Pakistan and the world, as they have a large role to play in informing the general public and promoting preventive practices given their influence in society.

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