DOI: https://doi.org/10.54393/pjhs.v5i06.1700

PAKISTAN JOURNAL OF HEALTH SCIENCES
https://thejas.com.pk/index.php/pjhs
ISSN (P): 2790-9352, (E): 2790-9344
Volume 5, Issue 6 (June 2024)

Original Article

Knowledge Regarding Cervical Cancer Screening Among Medical and Non-Medical Undergraduates in Peshawar, Pakistan: A Step towards Preventive Healthcare

Khansa Khan[1], Salman Zahir[1*], Faqir Ullah[2], Sultan Zeb[3], Natkai Sulaiman Khail[4], Usaram[4], Uzair Shafiq Ur Rehman[4], Huma Gul[4], Somia Mazhar[5] and Jamal Shah[4]

[1]Department of Medicine and Surgery, Northwest General Hospital and Research Center, Peshawar, Pakistan
[2]Department of Forensic Medicine, Northwest School of Medicine, Peshawar, Pakistan
[3]Department of Anatomy, Northwest School of Medicine, Peshawar, Pakistan
[4]Department of Medicine and Surgery, Northwest School of Medicine, Peshawar, Pakistan
[5]Department of Biomedical Sciences, National University of Science and Technology, Islamabad, Pakistan

ARTICLE INFO

Keywords:
Human Papillomavirus, Cervical Cancer, Screening, Knowledge, Attitude, Practices, Pap Smear

How to Cite:
Khan, K., Zahir, S., Ullah, F., Zeb, S., Khail, N. S., Usaram, ., Rehman, U. S. U., Gul, H., Mazhar, S., & Shah, J. (2024). Knowledge Regarding Cervical Cancer Screening Among Medical and Non-Medical Undergraduates in Peshawar, Pakistan: A Step towards Preventive Healthcare: Knowledge of Cervical Cancer Screening . Pakistan Journal of Health Sciences, 5(06). https://doi.org/10.54393/pjhs.v5i06.1700

***Corresponding Author:**
Salman Zahir
Department of Medicine and Surgery, Northwest General Hospital and Research Center, Peshawar, Pakistan
salmanzahir01@gmail.com

Received Date: 18th May, 2024
Acceptance Date: 28th June, 2024
Published Date: 30th June, 2024

ABSTRACT

A major global health concern, cervical cancer primarily affects younger women and those living in less developed areas. Comprehending students' knowledge, attitudes, and practices around cervical cancer screening is essential for future leadership roles in healthcare. **Objectives:** To assess the knowledge, attitude and practices regarding cervical cancer screening among undergraduate medical and non-medical students in Peshawar, Pakistan. **Methods:** A comparative observational cross-sectional study was conducted which lasted eight months. To accomplish a sample size of 474 through non-probability convenient sampling technique was used among undergraduate medical and non-medical students' population from Peshawar. A standardized questionnaire was used for data collection and SPSS version 26.0 was used for data analysis. **Results:** Among the participants, 62.9% acknowledged the significance of cervical screening in the early detection of lesions and 83.1% correctly identified HPV as the principal cause of cervical cancer. There was a general consensus toward early HPV screening (80.4%), and HPV vaccination (80.6%). However, there were clear differences in practice, 14.1% of participants reported smoking, 18.6% reported having pap smears, and 17.9% reported having had the HPV vaccine. **Conclusions:** The medical students were more knowledgeable about cervical cancer screening as compared to the non-medical. It was also concluded that even though the participants didn't participate in many preventive measures, most participants had positive attitudes towards early diagnosis, screening and HPV vaccination.

INTRODUCTION

Cervical cancer is highly preventable among humans and is predominantly found in females below the age of 45, with a notable prevalence among college-aged individuals [1]. Regional variations significantly affect the prevalence of cervical cancer; it is ranked fourth among women and seventh overall globally. Approximately 85% of cases are concentrated in less-developed areas, whereas it constitutes nearly 12% of all female cancer diagnoses [2]. The development of cervical cancer is strongly linked to Human Papillomavirus (HPV) infection, primarily type 16 and 18. Cervical cancer can be prevented through primary and secondary prevention. Preventing HPV infection constitutes the primary prevention, while cytological screening constitutes secondary prevention. According to the WHO, HPV's DNA detection screening should commence at age 30, followed by regular screenings every five to 10 years [3]. Epidemiological factors contributing to cervical cancer include engaging in sexual activity with

DOI: https://doi.org/10.54393/pjhs.v5i06.1700

multiple partners, starting sexual activity at a young age, contracting Human Papillomavirus (HPV) infection, experiencing lower genital tract neoplasia, being exposed to someone with cervical neoplasia, having a history of Sexually Transmitted Diseases (STDs), smoking cigarettes, being infected with Human Immunodeficiency Virus (HIV), experiencing other forms of immune system suppression, and long-term use of oral contraceptive pills [4-6]. Cervical cancer presents with symptoms such as irregular vaginal bleeding, pelvic discomfort, bleeding during or after sexual activity and abnormal vaginal discharge [7, 8]. It can be prevented by making efforts towards early detection of precancerous changes through cervical screening and also through administering HPV vaccines. However, numerous obstacles hinder cervical cancer screening particularly in developing nations like ours. This includes limited and underutilized screening resources, insufficient awareness and negative attitudes toward cervical cancer and its risk factors, cultural beliefs, a sense of well-being, social stigma, anxiety about test outcomes, and concerns about marital discord [8]. Research indicates that women with comprehensive knowledge and heightened awareness regarding cervical cancer are more inclined to participate in cervical cancer screening activities [9]. In 2013, Pakistan was ranked seventh in the Cervical Cancer Global Crisis Card for having one of the highest numbers of deaths from cervical cancer. The report stated that over 7,000 women succumb to this disease annually in the country [10]. Similarly, in another study from Lahore, Pakistan it was seen that 70.7% participants had poor knowledge, also 64% had a negative attitude towards cervical cancer screening [11]. After reviewing the literature on the burden of cervical cancer, there emerged a need to explore the knowledge regarding cervical cancer among both medical and non-medical students of Peshawar, Pakistan.

This research aimed to concentrate on students due to their role as future leaders and healthcare professionals, responsible for disseminating awareness about cervical cancer and screening. Assessing their knowledge, attitudes, and practices concerning cervical cancer was deemed essential for this purpose.

METHODS

The research was carried out in Peshawar, Khyber Pakhtunkhwa, Pakistan, using a comparative observational cross-sectional methodology. It was conducted from January 2023 to August 2023, for a total of eight months. By utilizing the Open Epi Sample Size Calculator, the sample size was calculated to be 471 participants with a 97% confidence level, a 5% confidence limit and a 51.6% anticipated frequency [12]. Students from medical and non-medical departments at multiple Peshawar institutions made up the study population. The research did not include those who voluntarily declined to participate. Prior to involvement, participants were informed of the objectives of the study and requested to provide informed verbal consent. Using the non-probability convenient sampling technique, a standardized questionnaire was employed to collect data. The questionnaire used for data collection was meticulously designed, drawing upon an extensive review of the existing literature and underwent validation by domain experts, resulting in a positive Cronbach's alpha value. Using in-person interviews, the questionnaires were distributed; 474 questionnaires were returned. The Northwest School of Medicine's Institutional Review Board and Ethics Committee approved the study's design (IRB&EC/2022-SM/054) (Issued Date: 12th September, 2022). The participant's knowledge of cervical screening prevention was assessed by assigning zero points for incorrect answers and 1 point for correct answers for all the knowledge, attitude and practice questions. The participants who had scored equal to or more than the median for correct responses were labelled as having adequate knowledge, positive attitude and good practices. While those with correct responses less than the median were labelled as having inadequate knowledge, negative attitude and poor practices [12]. The students from first and second year were grouped into junior years whereas the students from third, fourth and fifth year were grouped into senior years. The data analysis was done with SPSS version 26.0. To analyze the variables, descriptive statistics were used, such as means with standard deviation, frequencies, and percentages. With a significant P-value of 0.05 to identify any significant differences, the link between the responses of medical and non-medical students was examined using the chi-square test.

RESULTS

This study comprised 474 participants, with 264 enrolled in medical programs and 210 in non-medical programs. The average age of the participants was 21.42 years, with a standard deviation of 1.843, ranging from 17 to 27 years. Of the participants, 267 (56.3%) were in their junior years of study, while 207 (43.7%) were in their senior years. Among them, 30 (6.3%) were married, with 13 from the medical field and 17 from non-medical fields as shown in table 1.

Table 1: Demographic Characteristics of the Participants

Variables	Medical N (%)	Non-Medical N (%)	Total N (%)
Participants' Year of Study			
Junior Years	170 (63.7%)	97 (36.3%)	267 (100%)
Senior Years	94 (45.4%)	113 (54.6%)	207 (100%)
Participants' Marital Status			
Single	251 (56.5%)	193 (43.5%)	444 (100%)
Married	13 (43.4%)	17 (56.7%)	30 (100%)
Total	264 (55.7%)	210 (44.3%)	474 (100%)

The study participants were asked about their knowledge

DOI: https://doi.org/10.54393/pjhs.v5i06.1700

regarding cervical cancer and its screening. A large majority (83.1%) correctly identified Human Papillomavirus (HPV) as the primary cause of cervical cancer (p-Value = 0.000). Among the 474 participants, 166 (35%) were knowledgeable about the various strains of HPV (p-Value = 0.001). Of the participants, about 62.9% acknowledged that cervical screening helps identify precancerous lesions early on (p-Value = 0.055), and 73.4% thought that early identification helped prevent and treat cervical cancer (p-Value = 0.033). Moreover, 64.1% believed that precancerous lesions progress slowly to cervical cancer (p-Value = 0.523). The participants identified having multiple sexual partners as the most perceived risk factor (55.9%), followed by HPV infection (52.1%). Yet, increasing parity was the least perceived risk factor, cited by only 15% of the participants as shown in table 2.

Table 2: Knowledge of the Participants Regarding Cervical Cancer and its Screening

Variables	Medical N (%)	Non-Medical N (%)	Total N (%)	p-Value	X^2-Value
Is cervical cancer fundamentally caused by the human papillomavirus (hpv)?					
Yes	242 (61.4%)	152 (38.6%)	394 (100%)	0.000	31.009
No	22 (27.5%)	58 (72.5%)	80 (100%)		
Is infection with the human papillomavirus a prevalent sexually transmitted infection?					
Yes	199 (58.2%)	143 (41.8%)	342 (100%	0.079	3.088
No	65 (49.2%)	67 (50.8%)	132 (100%)		
Do you know about the various HPV strains?					
Yes	76 (45.8%)	90 (54.2%)	166 (100%)	0.001	10.174
No	188 (61%)	120 (39%)	308 (100%)		
Are you aware that early diagnosis of precancerous lesions can be aided by cervical screening?					
Yes	176 (59.1%)	122 (40.9%)	298 (100%)	0.055	3.681
No	88 (50%)	88 (50%)	176 (100%)		
Can cervical cancer prevention and therapy benefit from early diagnosis of precancerous lesions?					
Yes	204 (58.6%)	144 (41.4%)	348 (100%)	0.033	4.538
No	60 (47.6%)	66 (52.4%)	126 (100%)		
Does cervical cancer take a long time to develop from precancerous lesions?					
Yes	166 (54.6%)	138 (45.4%)	304 (100%)	0.523	0.409
No	98 (57.6%)	72 (42.4%)	170 (100%)		
Do you know that Getting Vaccinated Against HPV can stop Cervical Cancer from developing?					
Yes	135 (54.4%)	113 (45.6%)	248 (100%)	0.563	0.335
No	129 (57.1%)	97 (42.9%)	226 (100%)		
Your resource for HPV screening information is?					
Books	30 (50%)	30 (50%)	60 (100%)	0.037	10.196
Social Media	78 (48.8%)	82 (51.2%)	160 (100%)		
Healthcare Workers	86 (60.6%)	56 (39.4%)	142 (100%)		
Friends	35 (55.6%)	28 (44.4%)	63 (100%)		
Newspaper/ Magazines	35 (71.4%)	14 (28.6%)	49 (100%)		
What are the Cervical Cancer risk factors?					
More than one sexual partner	170 (64.2%)	95 (35.8%)	265 (100%)	0.000	54.662
HPV	153 (61.9%)	94 (38.1%)	247 (100%)		
Early sexual activity onset age	71 (52.6%)	64 (47.4%)	135 (100%)		
Increasing Parity	37 (52.1%)	34 (47.9%)	71 (100%)		
Prolonged use of hormonal contraceptives	73 (53.7%)	63 (46.3%)	136 (100%)		
Current or previous sexually transmitted infections	127 (64.8%)	69 (35.2%)	196 (100%)		
Smoking	97 (70.8%)	40 (29.2%)	137 (100%)		

The mean knowledge score was recorded to be 9.68 ± 2.457. Out of 474 participants, 232 (48.9%) had inadequate knowledge about cervical cancer screening, whereas 242 (51.1%) had adequate knowledge about cervical cancer screening. The results also shows that there was significant statistical different found among different age groups and study programs. The findings werew summarized in table 3.

Table 3: Relationship of Adequacy of Knowledge with Demographic Characteristics of Population (Multivariate Analysis)

Variables	Categories	Inadequate Knowledge N (%)	Adequate Knowledge N (%)	Total N (%)	p-Value
Age	17 – 20 Years	76 (45%)	93 (55%)	169 (100%)	0.006
	21 – 23 Years	136 (55.3%)	110 (44.7%)	246 (100%)	
	24 – 27 Years	20 (33.9%)	39 (66.1%)	59 (100%)	
Study Program	Medical	108 (40.9%)	156 (59.1%)	264 (100%)	0.000
	Non-Medical	124 (59%)	86 (41%)	210 (100%)	
Year of study	Junior Year	128 (47.9%)	139 (52.1%)	267 (100%)	0.619
	Senior Year	104 (50.2%)	103 (49.8%)	207 (100%)	
Marital Status	Single	213 (48%)	231 (52%)	444 (100%)	0.103
	Married	19 (63.3%)	11 (36.7%)	30 (100%)	
Total	-	232 (48.9%)	242 (51.1%)	-	-

Presents the participants' attitudes toward cervical screening. A significant majority (80.4%) believed that young women should undergo early screening for HPV (p-Value = 0.000), while 80.6% recommended HPV vaccination for women (p-Value = 0.031) as shown in table 4.

Table 4: Attitude of the Participants towards Cervical Cancer Screening

Variables	Medical N (%)	Non-Medical N (%)	Total N (%)	p-Value	X^2-Value
Should young women get HPV screenings done earlier, in your opinion?					
Yes	228 (59.8%)	153 (40.2%)	381 (100%)	0.000	13.529
No	36 (38.7%)	57 (61.3%)	93 (100%)		
Would you suggest routine screening to identify precancerous lesions early on?					
Yes	190 (55.7%)	151 (44.3%)	341 (100%)	0.988	0.000
No	74 (55.6%)	59 (44.4%)	133 (100%)		
Do you believe that HPV vaccinations for young women are necessary?					
Yes	222 (58.1%)	160 (41.9%)	382 (100%)	0.031	4.667
No	42 (45.7%)	50 (54.3%)	92 (100%)		

DOI: https://doi.org/10.54393/pjhs.v5i06.1700

In terms of young women's practices related to cervical cancer prevention, 14.1% of the participants reported smoking (p-Value = 0.000), 18.6% had undergone a pap smear previously (p-Value = 0.032), and 17.9% had received the HPV vaccine (p-Value = 0.077). The findings were mentioned in table 5.

Table 5: Practices of the Participants towards Cervical Cancer Prevention

Variables	Medical N (%)	Non-Medical N (%)	Total N (%)	p-Value	X^2-Value
Are you a smoker?					
Yes	24 (35.8%)	43 (64.2%)	67 (100%)	0.000	12.492
No	240 (59%)	167 (41%)	407 (100%)		
Have you had a pap test done previously?					
Yes	40 (45.5%)	48 (54.5%)	88 (100%)	0.032	4.594
No	224 (58%)	162 (42%)	386 (100%)		
Do you have an HPV vaccination?					
Yes	40 (47.1%)	45 (52.9%)	85 (100%)	0.077	3.131
No	224 (57.6%)	165 (42.4%)	389 (100%)		

DISCUSSION

Particularly affecting women in prospering and developing nations, cervical cancer is still a major global health concern. With a high morbidity and mortality rate, cervical cancer continues to be a threat to women's health despite advances in medical technology and expanded awareness efforts. With that in mind, the purpose of this study was to assess the knowledge, attitudes, and practices around cervical cancer screening among both medical and non-medical female students in our locality. According to a study by Gismondi M *et al.*, only 28.8% of participants recognized HPV as the risk factor for cervical cancer and that same study reported that 23.5% knew that having multiple sexual partners was another risk factor, which in our study was reported to be known by 55.9% of the participants [13]. However, our study showed that a good percentage (83.1%) of the participants of human papillomavirus as the cause of cervical cancer. Comparably, 72% of participants in a study by Singh J mentioned having several sexual partners as a risk factor for cervical cancer [14]. Taking into account the methods for preventing cervical screening while we reported 17.9% of individuals were vaccinated against HPV, Patel IS *et al.*, stated that just 8% of their subjects had received the vaccination [15]. Padmanabha N *et al.*, stated that 18% of their participants had never heard of vaccine against HPV and 21% were vaccinated [16]. Likewise, only 14.8% of respondents in a different study by Tadesse A reported having good understanding about cervical cancer screening, which is less than with our findings showing 51.1% of respondents had adequate knowledge [17]. We discovered that 14.1% of participants had smoked before and 28.9% of participants acknowledged smoking as a risk factor. Gebregziabher D *et al.*, also showed that 7% of individuals indicated quitting smoking as a preventive measure against cervical cancer [18]. The low level of knowledge and practice among the study participants was also mentioned in another study conducted in Ethiopia by Endalew DA *et al* [19]. In the current study, 28.7% of participants acknowledged using contraceptive pills as a risk factor, whereas 46% of individuals in a study by Altamimi T [20]. In contrast to the 18.4% of our participants who had had a pap smear, 47% of respondents nationwide in a study by Hirani S *et al.*, showed that they had heard about pap smears before, of which 73% had had one [10]. In contrast, a negative attitude regarding HPV vaccination and Pap smear screening was noted in a different study conducted in Karachi, Pakistan by Riaz L *et al* [21]. Despite potential biases such as cross-sectional study design, voluntary participation, and limited generalizability, the study's strengths include its well-defined objectives, statistically determined representative sample size, comprehensive statistical analysis using SPSS, and a structured questionnaire evaluating participants' knowledge of cervical screening prevention.

CONCLUSIONS

The medical students were more knowledgeable about cervical cancer screening as compared to the non-medical. It seemed that about half of the participants had adequate knowledge of cervical cancer screening. It was also concluded that even though the participants didn't participate in many preventive measures, most participants had positive attitudes towards early diagnosis, screening and HPV vaccination. Future research should focus on specified areas according to the findings of this study. These shall include the design and evaluation of intervention aimed at improving knowledge, attitude, and practices towards the screening, studying barriers to participation, which include logistical, cultural belief systems, and fear. In this respect, looking toward healthcare providers, cost-effectiveness of screening programs and psychosocial factors regarding attitude and perception is important.

Authors Contribution

Conceptualization: KK, SZ[1], FU, SZ[2]
Methodology: KK, SZ[1], FU, SZ[2], NS, U,
Formal analysis: KK, SZ[1], NS, U, USUR, HG, SM, JS
Writing, review and editing: KK, SZ[1], USUR, HG, SM, JS

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

Source of Funding

The authors received no financial support for the research, authorship and/or publication of this article.

DOI: https://doi.org/10.54393/pjhs.v5i06.1700

REFERENCES

[1] Ahmed NU, Rojas P, Degarege A. Knowledge of cervical cancer and adherence to Pap smear screening test among female university students in a multiethnic institution, USA. Journal of the National Medical Association. 2020 Jun; 112(3): 300-7. doi: 10.1016/j.jnma.2020.03.007.

[2] Manikandan S, Behera S, Naidu NM, Angamuthu V, Mohammed OF, Debata A. Knowledge and awareness toward cervical cancer screening and prevention among the professional college female students. Journal of Pharmacy and Bioallied Sciences. 2019 May; 11(2): S314-20. doi: 10.4103/JPBS.JPBS_21_19.

[3] Osowiecka K, Yahuza S, Szwiec M, Gwara A, Kasprzycka K, Godawska M *et al.* Students' knowledge about cervical cancer prevention in Poland. Medicina. 2021 Sep; 57(10): 1045. doi: 10.3390/medicina57101045.

[4] Tsegaye S, Mengistu D, Gultie T. Knowledge and attitude towards cervical cancer screening and associated factors among female Hawassa university college of medicine and health sciences students. MOJ Public Health. 2018 Jun; 7(3): 151-8. doi: 10.15406/mojph.2018.07.00221.

[5] Tilahun T, Tulu T, Dechasa W. Knowledge, attitude and practice of cervical cancer screening and associated factors amongst female students at Wollega University, western Ethiopia. BioMed Central Research Notes. 2019 Dec; 12: 1-5. doi: 10.1186/s13104-019-4564-x.

[6] Ifediora CO and Azuike EC. Knowledge and attitudes about cervical cancer and its prevention among female secondary school students in Nigeria. Tropical Medicine & International Health. 2018 Jul; 23(7): 714-23. doi: 10.1111/tmi.13070.

[7] Heena H, Durrani S, AlFayyad I, Riaz M, Tabasim R, Parvez G *et al.* Knowledge, attitudes, and practices towards cervical cancer and screening amongst female healthcare professionals: a cross-sectional study. Journal of Oncology. 2019 Oct; 2019: 5423130. doi: 10.1155/2019/5423130.

[8] Getaneh A, Tegene B, Belachew T. Knowledge, attitude and practices on cervical cancer screening among undergraduate female students in University of Gondar, Northwest Ethiopia: an institution based cross sectional study. BioMed Central Public Health. 2021 Dec; 21: 1-9. doi: 10.1186/s12889-021-10853-2.

[9] Annan FM, Oppong Asante K, Kugbey N. Perceived seriousness mediates the influence of cervical cancer knowledge on screening practices among female university students in Ghana. BioMed Central Women's Health. 2019 Dec; 19: 1-8. doi: 10.1186/s12905-019-0842-y.

[10] Hirani S, Khan S, Akram S, Virji SN, Shaikh PA, Naeem E *et al.* Knowledge, awareness, and practices of cervical cancer, its risk factors, screening, and prevention among women in Karachi, Pakistan. European Journal of Cancer Prevention. 2021 Jan; 30(1): 97-102. doi: 10.1097/CEJ.0000000000000590.

[11] Siddiqa A, Iqbal S, Hameed W, Saba A, Khalid U, Younas N *et al.* Knowledge and Attitude Towards Cervical Cancer and its Screening among Women Attending the Gynecology Out Patient Department: Cervical Cancer and its Screening. Pakistan Journal of Health Sciences. 2023 Jun: 119-23. doi: 10.54393/pjhs.v4i06.791.

[12] Kumari K, Shahid A, Farooqui A, Abbas K, Bashir F. Awareness of HPV Infection and its Relationship to Cervical Cancer in Medical Students of Karachi, Pakistan. Annals of Jinnah Sindh Medical University. 2022 Feb; 8(2): 74-9. doi: 10.46663/ajsmu.v8i2.74-79.

[13] Gismondi M, Augustine AM, Tahir Khokhar MA, Khokhar HT, Twentyman KE, Florea ID *et al.* Are medical students from across the world aware of cervical cancer, HPV infection and vaccination? A cross-sectional comparative study. Journal of Cancer Education. 2021 Aug; 36(4): 682-8. doi: 10.1007/s13187-019-01686-0.

[14] Singh J and Baliga SS. Knowledge regarding cervical cancer and HPV vaccine among medical students: A cross-sectional study. Clinical Epidemiology and Global Health. 2021 Jan; 9: 289-92. doi: 10.1016/j.cegh.2020.09.012.

[15] Patel IS, Dongara AR, Mungala BM, Chapla A, Phatak AG, Nimbalkar SM. Knowledge and attitude about cervical cancer and human papillomavirus vaccine among medical and paramedical students of a university. Journal of Family Medicine and Primary Care. 2021 Jan; 10(1): 462-7. doi: 10.4103/jfmpc.jfmpc_625_20.

[16] Padmanabha N, Kini JR, Alwani AA, Sardesai A. Acceptability of human papillomavirus vaccination among medical students in Mangalore, India. Vaccine. 2019 Feb; 37(9): 1174-81. doi: 10.1016/j.vaccine.2019.01.032.

[17] Tadesse A, Tafa Segni M, Demissie HF. Knowledge, attitude, and practice (KAP) toward cervical cancer screening among adama science and technology university female students, Ethiopia. International Journal of Breast Cancer. 2022 Jan; 2022(1): 2490327. doi: 10.1155/2022/2490327.

[18] Gebregziabher D, Berhanie E, Birhanu T, Tesfamariam K. Correlates of cervical cancer screening uptake among female under graduate students of Aksum University, College of Health Sciences, Tigray, Ethiopia. BioMed Central Research Notes. 2019 Dec; 12: 1-6. doi; 10.1186/s13104-019-4570-z.

DOI: https://doi.org/10.54393/pjhs.v5i06.1700

[19] Endalew DA, Moti D, Mohammed N, Redi S, Wassihun Alemu B. 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. 2020 Sep; 15(9): e0238869. doi: 10.1371/journal.pone.0238869.

[20] Altamimi T. Human papillomavirus and its vaccination: Knowledge and attitudes among female university students in Saudi Arabia. Journal of Family Medicine and Primary Care. 2020 Apr; 9(4): 1849-55. doi: 10.4103/jfmpc.jfmpc_1205_19.

[21] Riaz L, Manazir S, Jawed F, Ali SA, Riaz R. Knowledge, perception, and prevention practices related to human papillomavirus-based cervical cancer and its socioeconomic correlates among women in Karachi, Pakistan. Cureus. 2020 Mar; 12(3). doi: 10.7759/cureus.7183.