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Knowledge and Attitude Level Towards Cervical Cancer and Pap Smear Screening among University Students

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ABSTRACT

Background: Cervical cancer is mainly caused by the Human Papilloma Virus (HPV) and it is the most common malignancy among women worldwide with significant number of mortality rates. The objective of this study is to assess the level of knowledge and attitude regarding cervical cancer and pap smear screening and its association with sociodemographic characteristics among female students at International Islamic University Malaysia (IIUM) Kuantan Campus, Pahang.

Methods: A quantitative cross-sectional study using the convenience sampling method was conducted among 369 female undergraduate students of IIUM Kuantan Campus, from March to May 2023. Data were collected using a physical questionnaire which was available in the English Language that was distributed to all female undergraduate students in the campus. Data analysis was done by using SPSS version 27.

Results: This study demonstrated that the majority of the female students have average knowledge of cervical cancer (35.8%) and low knowledge of pap smear screening (37.9%). In addition, they have a low attitude toward cervical cancer (37.9%) and an average attitude toward pap smear screening (40.4%). It is also demonstrated that age, kulliyyah and year of study are significantly associated with knowledge level towards cervical cancer and pap smear screening (p<0.05). For attitude level of cervical cancer, there is a significant association between kulliyyah, family history of cancer and family history of cervical cancer (p<0.05). In addition, there is a significant association between year of study and family history of cervical cancer towards attitude level of pap smear screening (p<0.05). This study also demonstrated that most of the participants are unaware if vaccinating males can reduce the incidence of cervical cancer or not (57.2%), agreed that a woman who had a hysterectomy performed does not need to do a pap smear anymore (55.8%), which is incorrect, agreed that they feel shy, embarrassed and reluctant during pap smear test examinations (46.1%) and they afraid the results may show that they are positive for cancer (54.7%).

Conclusion: Hence, it is imperative to plan and implement targeted health promotion initiatives aimed at elevating the knowledge and reshaping the attitudes of female undergraduates pertaining on cervical cancer and the importance of pap smear screening test.

Keywords: Knowledge; Attitude; Cervical cancer; Pap smear screening; University students

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INTRODUCTION

Cervical cancer is a cancer caused mostly by the Human Papilloma Virus (HPV) that occurs in the cells of a female's cervix, which is the lower part of the uterus which connects the birth canal, also known as the vagina, to the uterus' upper part (1). Cervical cancer develops gradually over time and the cervical cells go through changes which is known as dysplasia, the growth of abnormal cells in the tissue of the cervix (2). There are two types of cervical cancers: adenocarcinomas forming 10% to 20% of cervical cancer and squamous cell carcinomas forming 70% to 90% of cervical cancer (3). The World Health Organisation (WHO) reported that cervical cancer is the fourth most common type of cancer occurred in females globally with around 660 000 new cases and 350 000 deaths from cervical cancer in 2022 (4). About 94% of the deaths rate worldwide were observed in low-income countries around the world (4).

In Malaysia, cervical cancer is the third major cause of cancer in females (5). It is reported that 10.2 per 100 000 women in Malaysia experienced age-standardised cervical cancer in 2020 (6). The current estimated death due to HPV and cancers related to HPV in Malaysia were 991 out of 1740 women diagnosed with the disease every year (7). The Malaysian National Cancer Registry Report (MNCRR) 2012-2016 reported that cervical cancer is the third leading cause of cancer-related deaths in Malaysian females with the highest rate of incidence between 70 to 74 years (8). The early detection of cervical cancer is crucial in females as the detection of 70% of cases in the staging report of MNCRR revealed that 41% of the detected cases were of late stage (III & IV) (8). Therefore, an early screening test can help in providing an early treatment and prevention of cervical cancer by HPV vaccination can enhance the quality of life and ensuring better survival rates.

Cervical cancer in women can be detected with the help of a pap smear screening test, also known as pap test (9). A pap smear test is important in examining abnormal growth or changes in the cervix cells, which could help to indicate the presence of cancerous lesions in the cervix that could lead to the formation of malignant tumours causing cervical cancer in women (10). In the pap smear test, the opening of the cervix is scraped to take the samples of cervical cells which are then investigated under the microscope for identifying any abnormal growth or shape of cervical cells which could indicate the symptoms of HPV infection or precancerous lesions in women (11). A Pap smear screening test significantly enhances the chances of recovery in women. When combined with an HPV test, it provides a more effective screening approach, potentially reducing cervical cancer-related mortality.

Cervical cancer awareness and its prevention, pap smear screening tests, HPV vaccination and treatment were reported to be unsatisfactory in Malaysian women (12). Another previous study reported that the perception of women in Malaysia to the susceptibility of cervical cancer was low and there was an insufficiency of knowledge about the screening for cervical cancer using pap smear screening tests along with the benefits and indications of the test (13). It was reported that more than 80% of the female participants were unaware that the causative agent for cervical cancer is HPV (14). Another study reported that many women in Malaysia refused to take HPV vaccination due to their lack of awareness and knowledge (15). It is also reported that people living in rural areas, schools, and university students had low knowledge level concerning the prevention and cure of cervical cancer (16). Thus, this study aims to evaluate the knowledge and attitude level, and its association with sociodemographic characteristics regarding cervical cancer and pap smear screening test among female students at International Islamic University Malaysia (IIUM) Kuantan Campus, Pahang.

MATERIALS AND METHODS

Sample Collection

This study employed a quantitative, descriptive cross-sectional design to evaluate the knowledge and attitudes of female students at the International Islamic University Malaysia (IIUM) Kuantan Campus, Pahang, regarding cervical cancer and Pap smear screening, utilizing a convenience sampling method. The Raosoft, Inc. software sample size calculator was used in this study, with a 5% margin of error, a confidence interval of 95%, a total population size of 2569 with a 50% response distribution. Thus, the required minimum sample size for this study was 369 participants,

with an additional 10% dropout rate. The inclusion criteria for this study consist of undergraduate female students aged 19 to 24 years, while the exclusion criteria include students who were on semester break during the data collection period.

The questionnaire used in this study were adapted from four previous researches entitled "Knowledge, attitudes, and practices regarding cervical cancer and screening among women visiting primary health care Centres in Bahrain" (17), "Knowledge and attitude towards cervical cancer among reproductive age group women in Gondar town, North West Ethiopia" (14), "Cervical cancer and pap smear screening: knowledge, attitude and practice among working women in northern state of Malaysia" (18) and "Knowledge and attitude regarding cervical cancer and its prevention among young female adults in Kuantan, Malaysia" (15). The questionnaire used in this study is divided into five main sections, all in English. Section A gathers sociodemographic data from participants, including details such as age, race, faculty (kulliyyah), year of study, residency, marital status, family income, and personal or family history of cancer. Section B focuses on knowledge about cervical cancer, covering its causes, risk factors, symptoms, and prevention methods. Section C addresses knowledge about Pap smear screening, including its purpose, the optimal timing, and the recommended screening intervals. Section D explores attitudes toward cervical cancer, while Section E examines attitudes toward Pap smear screening, including feelings of shyness, fear, or pain associated with the procedure.

Ethical approvals were obtained from the Kulliyyah of Nursing Postgraduate and Research Committee (KNPGRC) and the IIUM Research Committee (IREC), with an approval number of IREC 2023-KON/NURF46. Data were collected between March to May 2023, using physical questionnaire which was available in the English Language and distributed to all female undergraduate students in the campus. Participants were briefed about the objectives and nature of the study before they started answering the questionnaire. In addition, informed consent was also obtained from the respondents who volunteered to participate in this study. The respondents can freely decide to participate in the study and can withdraw consent or decline to answer the questionnaire at any time if they wish to do so. The questionnaire collected will be kept confidential and only for academic purposes.

Data Analysis

The data was analysed using Statistical Package for Social Science (SPSS) version 27.0.
Descriptive statistical tests were used to measure the frequency and percentage of variables. Chi-square test was used to assess the differences in the variables and Bonferroni post-hoc test was used for multiple comparisons. P-value less than 0.05 were considered statistically significant.

RESULTS

Sociodemographic Characteristics of Respondents

Table 1 shows that majority of the participants are 21 to 22 years old (46.9%), Malay (98.6%), from Kulliyyah of Nursing (26.0%) and Year 3 students (30.1%). Most of the participants also from urban areas (65.6%), single status (98.4%) with family income more than RM6501 (43.6%). Around 0.3% participants smoked, 0.5% participants had a personal history of cancer, 24.1% participants with family history of cancer, 0.5% participants with first-degree relatives of cervical cancer and 4.6% participants with second-degree relatives of cervical cancer.

Knowledge on Cervical Cancer

According to **Table 2**, majority of the participants have heard about cervical cancer (96.7%), aware that cervical cancer may be caused by HPV (69.1%) and one of the main fatal cancers in women (90.0%). Majority of the participants reported to know the risk factor for cervical cancer (59.1%) such as family history of cervical cancer (87.5%), smoking (69.9%), poor vaginal hygiene (76.4%), multiple sexual partners (79.1%) and early start of sexual activity (48.2%). Next, 57.7% participants reported to know the common symptoms of cervical cancer, including, weight loss (71.8%), difficulty (69.1%) and pain (72.6%) during urination, abnormal (90.2%), smelly (82.9%) and blood (83.7%) vaginal discharge and, longer (61.2%) and irregular menstrual bleeding (72.6%). Most of the participants agreed that cervical cancer is preventable (81.0%) and curable (63.7%), with appropriate

age for getting tested is between 20 to 50 years old (88.9%). Furthermore, participants aware that treatment for cervical cancer are chemotherapy (91.3%), radiotherapy (72.1%) and surgical removal (81.6%). Next, majority of participants have heard about HPV vaccine (78.0%) and aware that the Malaysian government offers free vaccination (76.2%), exclusively for females (79.4%) and it should be taken before sexual activity starts (43.9%). However, 40.7% participants do not know if symptoms of cervical cancer can manifest at the disease's early, the risk factors of cervical cancer include consumption of a high diet (42.8%), mothers with lesser number of children (40.4%), miscarriage (41.2%), and multiparity (50.9%). Around 42.5% participants do not know if traditional medicine is a treatment for cervical cancer or not and 57.2% participants do not know if vaccinating males can reduce the incidence of cervical cancer or not. Therefore, the majority of the participants has average level of knowledge on cervical cancer (35.8%).

Table 1: Sociodemographic data (N=369)

Variables		Frequency (*n*)	Percentage (%)
Age	19-20	86	23.3
	21-22	173	46.9
	23-24	110	29.8
Race	Malay	364	98.6
	Chinese	3	0.8
	Others	2	0.5
Kulliyyah	Nursing	96	26.0
	Medicine	49	13.3
	Pharmacy	77	20.9
	Dentistry	55	14.9
	Allied Health	75	20.3
	Science	17	4.6
Year of study	Year 1	89	24.1
	Year 2	72	19.5
	Year 3	111	30.1
	Year 4	97	26.3
Residency	Rural	127	34.4
	Urban	242	65.6
Marital status	Single	363	98.4
	Married/Divorced	6	1.6
Family income	<RM 2000	67	18.2
	RM 2001 to RM 3500	50	13.6
	RM 3501 to RM 5000	56	15.2
	RM 5001 to RM 6500	35	9.5
	>RM 6501	161	43.6
Smoking	Yes	1	0.3
	No	368	99.7
Personal history of cancer	Yes	2	0.5
	No	367	99.5
Personal history of cervical cancer	Yes	0	0
	No	369	100
Family history of cancer	Yes	89	24.1
	No	280	75.9
Family history of cervical cancer	Yes (First-degree relatives of cervical cancer)	2	0.5
	Yes (Second-degree relatives of cervical cancer)	17	4.6
	No	350	94.9

Table 2: Knowledge regarding cervical cancer (N=369)

Variables	Frequency, *n* (%)		
	Yes	No	I don't know
Heard about cervical cancer?	357 (96.7%)	8 (2.2%)	4 (1.1%)
Regarding cervical cancer,			
It may be caused by HPV	255 (69.1)	12 (3.3)	102 (27.6)
It is one of the main fatal cancer in women	332 (90.0)	11 (3.0)	26 (7.0)
All adult women are at risk to get the cancer	299 (81.0)	31 (8.4)	39 (10.6)
Symptoms manifest at the disease's early	119 (32.2)	100 (27.1)	150 (40.7)
It is a preventable disease	260 (70.5)	29 (7.9)	80 (21.7)
It can be treated at an early stage	319 (86.4)	12 (3.3)	38 (10.3)
HPV is a causative agent of cervical cancer	243 (65.9)	7 (1.9)	119 (32.2)
Know the risk factor for cervical cancer	218 (59.1)	36 (9.8)	115 (31.2)
Below are the risk factor of cervical cancer:			
Family history of cervical cancer	323 (87.5)	26 (7.0)	20 (5.4)
Cancers affecting other reproductive organs	290 (78.6)	15 (4.1)	64 (17.3)
Consumption of high fat diet	147 (39.8)	64 (17.3)	158 (42.8)
Smoking	258 (69.9)	33 (8.9)	78 (21.1)
Never been pregnant	153 (41.5)	85 (23.0)	131 (35.5)
Mothers with less number of children	88 (23.8)	132 (35.8)	149 (40.4)
Poor vaginal hygiene	282 (76.4)	33 (8.9)	54 (14.6)
Miscarriage	138 (37.4)	79 (21.4)	152 (41.2)
Multiple sexual partners	292 (79.1)	16 (4.3)	61 (16.5)
Early start of sexual activity	178 (48.2)	57 (15.4)	134 (36.3)
Multiparity	143 (38.8)	38 (10.3)	188 (50.9)
Viral infection	258 (69.9)	26 (7.0)	85 (23.0)
HIV infection	226 (61.2)	43 (11.7)	100 (27.1)
HPV infection	288 (78.0)	6 (1.6)	75 (20.3)
Know common symptoms of cervical cancer	213 (57.7)	44 (11.9)	112 (30.4)
Below are the symptoms cervical cancer:			
Weight loss	265 (71.8)	25 (6.8)	79 (21.4)
Difficulty in passing urine	255 (69.1)	40 (10.8)	74 (20.1)
Pain during urination	268 (72.6)	30 (8.1)	71 (19.2)
Abnormal vaginal discharge	333 (90.2)	4 (1.1)	32 (8.7)
Smelly vaginal discharge	306 (82.9)	10 (2.7)	53 (14.4)
Blood stained discharge from vagina	309 (83.7)	6 (1.6)	54 (14.6)
Abnormal vaginal bleeding between periods	296 (80.2)	10 (2.7)	63 (17.1)
Longer menstrual period	226 (61.2)	21 (5.7)	122 (33.1)
Irregular menstrual bleeding	268 (72.6)	16 (4.3)	85 (23.0)
Bleeding after menopause	219 (59.3)	12 (3.3)	138 (37.4)
Discomfort or pain during sex	266 (72.1)	8 (2.2)	95 (25.7)
Bleeding after sexual activity	222 (60.2)	12 (3.3)	135 (36.6)
Cervical cancer is preventable	299 (81.0)	12 (3.3)	58 (15.7)
Cervical cancer is curable	235 (63.7)	26 (7.0)	108 (29.3)
Appropriate age for getting tested			
Old women>50 years	20 (5.4)		
Young women 20-50 years	328 (88.9)		
Adolescent girls 12-19 years	21 (5.7)		
Treatment for cervical cancer:			
Chemotherapy	337 (91.3)	5 (1.4)	27 (7.3)
Radiotherapy	266 (72.1)	16 (4.3)	87 (23.6)
Surgical removal	301 (81.6)	8 (2.2)	60 (16.3)
Traditional medicine	76 (20.6)	136 (36.9)	157 (42.5)
Have you heard about HPV vaccine?	288 (78.0)	57 (15.4)	24 (6.5)
Regarding HPV vaccination,			
Malaysian government offers free vaccination	281 (76.2)	11 (3.0)	77 (20.9)
It is exclusively for females	293 (79.4)	17 (4.6)	59 (16.0)
It as a treatment for cervical cancer	178 (48.2)	132 (35.8)	59 (16.0)
It is excellent in preventing cervical cancer	278 (75.3)	12 (3.3)	79 (21.4)

It should be taken before sexual activity starts	162 (43.9)	57 (15.4)	150 (40.7)
Vaccinating males can reduce incidence of cervical cancer	77 (20.9)	81 (22.0)	211 (57.2)
Below are the prevention of cervical cancer:			
Preventing with HPV infection	286 (77.5)	25 (6.8)	58 (15.7)
Practicing healthy sexual activity	322 (87.3)	7 (1.9)	40 (10.8)
Getting HPV vaccination	343 (93.0)	1 (0.3)	25 (6.8)
Undergoing Pap smear test	313 (84.4)	9 (2.4)	47 (12.7)

Total score of knowledge	Frequency (*n*)	Percentage (%)
Low	125	33.9
Average	132	35.8
High	112	30.4

Knowledge on Pap Smear Screening

Table 3 demonstrated that the majority of the participants have heard about pap smear (83.7%) for the first instance by mass media (44.7%) and internet as the information source for screening of cervical cancer (76.7%). Most of the participants also reported that the pap smear's purpose is for the early detection of cervical cancer (94.3%) to discover abnormal cells in the cervix (97.3%), which involves the use of instrument to collect cervical cells via vagina (97.3%). Majority of the participants also agreed that it is recommended for women who have experienced sexual intercourse (78.6%) and, optimal time for pap smear screening is 10 days after menstruation (84.6%) and a woman should not have sex 24 hours before having pap smear (77.8%). The majority of participants agreed that women should undergo Pap smears at least every three years (84.8%), recognizing it as a non-invasive and relatively affordable procedure (72.6%).

Additionally, 82.9% believed women should start Pap smear screenings upon becoming sexually active, while 77.5% acknowledged its ability to detect other sexually transmitted diseases. Meanwhile, 73.2% disagreed with the notion that women who no longer plan to have children no longer need Pap smears. The participants also disagreed that pap smear should be discontinued after menopause (69.6%), a person does not need pap smears in the future if having a normal pap smear (74.3%), there is no need to have a pap smear if it is not administered by a doctor (52.3%).

Unfortunately, 60.2% participants do not know how many times a healthy woman should undergo pap smear test and majority agreed that woman who had a hysterectomy performed does not need to do a pap smear anymore (55.8%). Thus, most of the participants has low knowledge of pap smear (37.9%).

Attitude on Cervical Cancer

As seen in **Table 4**, majority of the participants agreed that having multiple sexual partners (93.8%), contraceptive pill (57.5%) and smoking (82.1%) are risk factor for cervical cancer, cervical cancer is transmittable through sexual intercourse (71.5%), HIV positivity increases the chance of getting cervical cancer (89.7%), cervical cancer is a major health problem for female of reproductive age group (93.2%), it is possible to detect cervical cancer with early screening before symptoms appear (92.1%), early detection of cervical cancer is good for treatment outcome (97.8%), cervical cancer is preventable (95.9%), it is possible to cure cervical cancer (89.2%), it is a serious illness (95.9%), it is very important to do regular pap smear (90.8%), vaccination should be made compulsory to females (94.0%) and ensure to go for pap smear test frequently after getting married (91.3%). Despite that, greater number of participants also disagreed that early marriage is a risk factor for cervical cancer (59.1%), they are at risk of getting cervical cancer (61.5%), they will not seek treatment even if the cancer is at an advanced stage (84.6%), there is no cure for this cancer when the cancer is at an advanced stage (69.4%), getting vaccinated is scary (82.1%) and painful (76.7%), HPV vaccination may encourage people to have sex at an early age (85.6%) and having multiple sexual partners (85.9%), their parents might not allow me to get the HPV vaccination (90.2%) and their religion prohibits them from receiving HPV vaccination because it is sex related (91.1%). Thus, majority of the participants has low attitude of cervical cancer (37.9%).

Table 3: Level of knowledge pap smear screening (N=369)

Variables	Frequency, *n* (%)	
	Yes	No
Have you heard about pap smear?	309 (83.7)	60 (16.3)
If yes, where did you hear about pap smear for the first time?		
Relatives	51 (13.8)	
Friends	69 (18.7)	
Health workers	111 (30.1)	
Mass media	165 (44.7)	
Other, please mention: lecturer	49 (13.3)	
Source information about screening of cervical cancer		
Newspaper	34 (9.2)	
Magazine	18 (4.9)	
Television	85 (23.0)	
Relatives	58 (15.7)	
Medical practitioner	163 (44.2)	
Friend	73 (19.8)	
Internet	283 (76.7)	
Other, please mention: lecturer	17 (4.6)	
Other, please mention: banner	1 (0.3)	
What are the purpose of pap smear:		
Early detection of cervical cancer	348 (94.3)	
Detection of sexually transmitted disease	18 (4.9)	
Detection of HIV/AIDS	3 (0.8)	
Pap smear test procedure involve		
Surgical	10 (2.7)	
Use of instrument to collect cervical cells via vagina	359 (97.3)	
How many times should a healthy woman undergo pap smear test?		
Only once	52 (14.1)	
Two times only	22 (6.0)	
At least three times or above	73 (19.8)	
I don't know	222 (60.2)	
Women recommended for pap smear screening:		
Women who have experienced sexual intercourse	290 (78.6)	
Postmenopausal women	23 (6.2)	
Married women who were never pregnant	56 (15.2)	
Optimal time for pap smear screening		
During menstruation	30 (8.1)	
One day after menstruation	27 (7.3)	
10 days after menstruation	312 (84.6)	
Recommended interval of pap smear testing		
Annually	105 (28.5)	
Every 1-3 years	181 (49.1)	
Every 5 years	51 (13.8)	
Every 10 years	9 (2.4)	
Once in a lifetime	23 (6.2)	
Women should have Pap Smears at least every 3 years	313 (84.8)	56 (15.2)
Pap smear is the most helpful way to detect pre-cancer and cancer of the cervix	361 (97.8)	8 (2.2)
Pap smear is not able to detect precancerous cells before manifestations of its symptoms	139 (37.7)	230 (62.3)
The purpose of the Pap smear is to detect abnormal cells in the cervix	359 (97.3)	10 (2.7)
Pap smear is not successful in reducing incidence and mortality of cervical cancer	136 (36.9)	233 (63.1)
Pap smear is able to detect all types of female genital cancer	192 (52.0)	177 (48.0)

Pap smear is a non-invasive and relatively inexpensive method	268 (72.6)	101 (27.4)
Women should have Pap smear since the onset of sexual activity	306 (82.9)	63 (17.1)
In Pap smear, cervical cells are examined	359 (97.3)	10 (2.7)
Pap smears can be performed at both menstrual and non-menstrual period	120 (32.5)	249 (67.5)
A woman should not have sex 24 h before having Pap smear	287 (77.8)	82 (22.2)
Pap smear should be discontinued after menopause	112 (30.4)	257 (69.6)
If someone is having a normal Pap smear, she does not need Pap smears in the future	95 (25.7)	274 (74.3)
There is no need to have a Pap smear if it is not administered by a doctor	176 (47.7)	193 (52.3)
Regarding Pap smear,		
It is provided free at government health facilities in Malaysia	270 (73.2)	99 (26.8)
It is a procedure where a cell sample will be collected from a woman's cervix	357 (96.7)	12 (3.3)
It can detect other sexually transmitted diseases	286 (77.5)	83 (22.5)
Mothers who plan to have no more children do not need to do Pap smear anymore	99 (26.8)	270 (73.2)
A woman who had a hysterectomy done (removal of the uterus only) does not need to do a Pap smear anymore	206 (55.8)	163 (44.2)

Total score of knowledge	Frequency (*n*)	Percentage (%)
Low	140	37.9
Average	118	32.0
High	111	30.1

Attitude on Pap Smear Screening

Table 5 demonstrated that majority of the participants agreed that they will feel embarrassed if a male doctor runs the test (87.3%), pap smear are painful (65.9%) and, unpleasant and embarrassing (59.1%), difficult to take time off to go for pap smear (55.6%) and to get to the pap smear clinic (52.8%), being busy is a barrier to pap smear (73.7%), afraid that something wrong will be detected if go for pap smear (55.3%), worried if they was found to have early signs of cancer (84.3%) and will take HPV vaccine (95.9%). A greater number of participants also agreed that they feel shy, embarrassed and reluctant during pap smear test examinations (46.1%), pap smear test is very strange for them (41.5%), they afraid the results may show that they are positive for cancer (54.7%), they do not know the suitable age for pap smear examination (39.6%), they lack information and awareness about cervical cancer (46.1%) and pap smear screening tests (46.9%), insufficient information given by health care personnel on cervical cancer (35.8%) and pap smear test (39.3%), they do not know the interval between pap smear screening tests (46.1%), they do not know where to go for a pap smear test (42.8%) and never received pap smear test results (46.6%). Majority of the participants also not sure if the process of pap smear examination is painful (49.6%) and will take a long time (55.6%), they will give priority to more important things than pap smear screening test (31.4%) and the cost of the pap smear test is too high (55.0%). In addition, most of the participants also disagreed that it is unnecessary to go only for a pap smear (44.7%) and they have difficulty talking to health care personnel about pap screening (32.2%). Therefore, majority of the participants has average attitude of pap smear (40.4%).

Association Between Sociodemographic Characteristics and The Knowledge Level of Cervical Cancer and Pap Smear Screening

Tables 6 and 7 demonstrated that there is an association between age (p<0.01), kulliyyah (p<0.01) and year of study (p=0.04) with level of knowledge towards cervical cancer and pap smear screening (p-value<0.05). It is also demonstrated that the knowledge level of cervical cancer and pap smear for participants aged 23-24 years old are significantly different compared to other age group, Kulliyyah of Nursing and Kulliyyah of Medicine are significantly different compared to others kulliyyah, and year 4 students are significantly different compared to other years.

Table 4: Level of attitude of cervical cancer (N=369)

Variables	Frequency, *n* (%)	
	Yes	**No**
Believe having multiple sexual partners is risk factor for cervical cancer	346 (93.8)	23 (6.2)
Believe cervical cancer is transmittable through sexual intercourse	264 (71.5)	105 (28.5)
Believe HIV positivity increases the chance of getting cervical cancer	331 (89.7)	38 (10.3)
Believe use of oral contraceptive pill is a risk factor for cervical cancer	212 (57.5)	157 (42.5)
Think that smoking is a risk factor for cervical cancer	303 (82.1)	66 (17.9)
Think early marriage is a risk factor for cervical cancer	151 (40.9)	218 (59.1)
Think cervical cancer is a major health problem for female of reproductive age group	344 (93.2)	25 (6.8)
Think it is possible to detect cervical cancer with early screening before symptoms appear	340 (92.1)	29 (7.9)
Think early detection of cervical cancer is good for treatment out come	361 (97.8)	8 (2.2)
Believe cervical cancer is preventable	354 (95.9)	15 (4.1)
Think it is possible to cure cervical cancer	329 (89.2)	40 (10.8)
I think it is a serious illness	354 (95.9)	15 (4.1)
I am at risk of getting cervical cancer	142 (38.5)	4(72.6%),
It is very important to do regular pap smear	335 (90.8)	34 (9.2)
I will not seek treatment even if the cancer is at an advanced stage	57 (15.4)	312 (84.6)
I believe there is no cure for this cancer when the cancer is at an advanced stage	113 (30.6)	256 (69.4)
Vaccination should be made compulsory to females	347 (94.0)	22 (6.0)
Getting vaccinated is scary	66 (17.9)	303 (82.1)
Getting vaccinated is painful	86 (23.3)	283 (76.7)
HPV vaccination is not safe for me	31 (8.4)	338 (91.6)
I don't think HPV vaccination will prevent HPV infection	39 (10.6)	330 (89.4)
HPV vaccination may encourage people to have sex at an early age	53 (14.4)	316 (85.6)
HPV vaccination may encourage people to have multiple sexual partners	52 (14.1)	317 (85.9)
My parents might not allow me to get the HPV vaccination	36 (9.8)	333 (90.2)
My religion prohibits me from receiving HPV vaccination because it is sex related	33 (8.9)	336 (91.1)
After getting married, I'll ensure myself to go for Pap smear test frequently	337 (91.3)	32 (8.7)
Total score of attitude	Frequency (*n*)	Percentage (%)
Low	140	37.9
Average	128	34.7
High	101	27.4

Table 5: Level of attitude of pap smear screening (N=369)

Variables	Frequency, *n* (%)	
	Yes	**No**
If male doctor performed the test, would you feel embarrassed?	322 (87.3)	42 (12.7)
If you were single, would you go for screening test?	184 (49.9)	185 (50.1)
Are you discouraged from screening for cervical cancer by your partner or others?	58 (15.7)	311 (84.3)
Do you have a fatalistic attitude?	57 (15.4)	312 (84.6)

Is it painful to have a pap smear?	243 (65.9)	126 (34.1)
Having a Pap smear is unpleasant/embarrassing	218 (59.1)	151 (40.9)
It is difficult to take time off to go for Pap smear	205 (55.6)	164 (44.4)
It is difficult to get to the Pap smear clinic	195 (52.8)	174 (47.2)
Being busy is a barrier to Pap smear	272 (73.7)	97 (26.3)
Pap smear is unnecessary if there are no signs and symptoms	82 (22.2)	287 (77.8)
Is it unnecessary to go only for pap smear test	63 (17.1)	306 (82.9)
Going for pap smear screening is too expensive	117 (31.7)	252 (68.3)
I am afraid that something wrong will be detected if I go for pap smear	204 (55.3)	165 (44.7)
I am uneasy about talking about cancer	130 (35.2)	239 (64.8)
I would be worried if I was found to have early signs of cancer	311 (84.3)	58 (15.7)
Would you take HPV vaccine?	354 (95.9)	15 (4.1)

Variables	Frequency, *n* (%)				
	Strongly disagree	Disagree	Not sure	Agree	Strongly agree
I feel shy, embarrassed and reluctant during the Pap smear test examination	20 (5.4)	56 (15.2)	71 (19.2)	170 (46.1)	52 (14.1)
Pap smear test is very strange for me	31 (8.4)	95 (25.7)	44 (11.9)	153 (41.5)	46 (12.5)
The process of Pap smear examination is painful	11 (3.0)	33 (8.9)	183 (49.6)	106 (28.7)	36 (9.8)
I'm afraid the results may show that I am positive for cancer	21 (5.7)	43 (11.7)	40 (10.8)	202 (54.7)	63 (17.1)
I don't know the suitable age for a Pap smear examination	37 (10.0)	87 (23.6)	58 (15.7)	146 (39.6)	41 (11.1)
I lack information and awareness about cervical cancer	22 (6.0)	85 (23.0)	45 (12.2)	170 (46.1)	47 (12.7)
I lack of information and awareness about Pap smear screening tests	18 (4.9)	72 (19.5)	41 (11.1)	173 (46.9)	65 (17.6)
Insufficient information given by health care personnel on cervical cancer	17 (4.6)	71 (19.2)	110 (29.8)	132 (35.8)	39 (10.6)
Insufficient information given by health care personnel on Pap smear test	12 (3.3)	64 (17.3)	104 (28.2)	145 (39.3)	44 (11.9)
I don't know the interval between Pap smear screening tests	10 (2.7)	60 (16.3)	64 (17.3)	170 (46.1)	65 (17.6)
The Pap smear examination process will take a long time	22 (6.0)	76 (20.6)	205 (55.6)	47 (12.7)	19 (5.1)
I give priority to more important things than Pap smear screening tests	24 (6.5)	104 (28.2)	116 (31.4)	108 (29.3)	17 (4.6)
It is unnecessary to go only for a Pap smear	47 (12.7)	165 (44.7)	93 (25.2)	56 (15.2)	8 (2.2)
The cost of the Pap smear test is too high for me	27 (7.3)	75 (20.3)	203 (55.0)	54 (14.6)	10 (2.7)
I do not know where to go for a Pap smear test	32 (8.7)	101 (27.4)	45 (12.2)	158 (42.8)	33 (8.9)
I have never received Pap smear test results	11 (3.0)	28 (7.6)	31 (8.4)	172 (46.6)	127 (34.4)
I have difficulty talking to health care personnel about Pap screening	33 (8.9)	119 (32.2)	96 (26.0)	91 (24.7)	30 (8.1)

Total score of attitude	Frequency (*n*)	Percentage (%)
Low	128	34.7
Average	149	40.4
High	92	24.9

Table 6: Association between sociodemographic characteristics and the knowledge level of cervical cancer (N=369)

Variable		Knowledge level, *n* (%)			*n* (%)	*p*-value*
		Low	Average	High		
Age	19-20	35 (9.50)	32 (8.70)	19 (5.1)	86 (23.3)	< 0.01*
	21-22	67 (18.2)	66 (17.9)	40 (10.8)	173 (46.9)	
	23-24	23 (6.2)	34 (9.2)	53 (14.4)	110 (29.8)[a]	
Race	Malay	125 (33.9)	129 (35.0)	110 (29.8)	364 (98.6)	0.573
	Chinese	0 (0.0)	2 (0.5)	1 (0.3)	3 (0.8)	
	Others	0 (0.0)	1 (0.3)	1 (0.3)	2 (0.5)	
Kulliyyah	Nursing	22 (6.0)	31 (8.4)	43 (11.7)	96 (26.0)[b]	< 0.01*
	Medicine	5 (1.4)	22 (6.0)	22 (6.0)	49 (13.3)[b]	
	Pharmacy	34 (9.2)	26 (7.0)	17 (4.6)	77 (20.9)	
	Dentistry	23 (6.2)	18 (4.9)	14 (3.8)	55 (14.9)	
	Allied Health	30 (8.1)	30 (8.1)	15 (4.1)	75 (20.3)	
	Science	11 (3.0)	5 (1.4)	1 (0.3)	17 (4.6)	
Year of Study	1	35 (9.5)	35 (9.5)	19 (5.1)	89 (24.1)	0.04*
	2	26 (7.0)	27 (7.3)	19 (5.1)	72 (19.5)	
	3	42 (11.4)	41 (11.1)	28 (7.6)	111 (30.1)	
	4	22 (6.0)	29(7.9)	46 (12.5)	97 (26.3)[c]	
Residency	Rural	42 (11.4)	47 (12.7)	38 (10.3)	127 (34.4)	0.936
	Urban	83 (22.5)	85 (23.0)	74 (20.1)	242 (65.6)	
Marital Status	Single	124 (33.6)	130 (35.2)	109 (29.5)	363 (98.4)	0.517
	Married/Divorced	1 (0.3)	2 (0.5)	3 (0.8)	6 (1.6)	
Family income	<RM 2000	25 (6.8)	22 (6.0)	20 (5.4)	67 (18.2)	0.712
	RM 2001 - RM 3500	12 (3.3)	17 (4.6)	21 (5.7)	50 (13.6)	
	RM 3501 - RM 5000	20 (5.4)	21 (5.7)	15 (4.1)	56 (15.2)	
	RM 5001 - RM 6500	11 (3.0)	12 (3.3)	12 (3.3)	35 (9.5)	
	>RM 6501	57 (15.4)	60 (16.3)	44 (11.9)	161 (43.6)	
Smoking	Yes	0 (0.0)	0 (0.0)	1 (0.3)	1 (0.3)	0.316
	No	125 (33.9)	132 (35.8)	111 (30.1)	368 (99.7)	
Personal history of cancer	Yes	0 (0)	2 (0.5)	0 (0)	2 (0.5)	0.164
	No	125 (33.9)	130 (35.2)	112 (30.4)	367 (99.5)	
Personal history of cervical cancer	Yes	0 (0)	0 (0)	0 (0)	0 (0)	-
	No	125 (33.9)	132 (35.8)	112 (30.4)	369 (100)	
Family history of cancer	Yes	30 (8.1)	31 (8.4)	28 (7.6)	89 (24.1)	0.962
	No	95 (25.7)	101 (27.4)	84 (22.8)	280 (75.9)	
Family history of cervical cancer	Yes (First degree)	1 (0.3)	0 (0)	1 (0.3)	2 (0.5)	0.559
	Yes (Second degree)	8 (2.2)	6 (1.6)	3 (0.8)	17 (4.6)	
	No	116 (31.4)	126 (34.1)	108 (29.3)	350 (94.9)	

*Chi square test, *p*-value<0.05

Bonferroni post hoc test: [a]age 23-24 years old are significantly different, [b]Kulliyyah of Nursing and Kulliyyah of Medicine are significantly different, [c]year 4 are significantly different

Table 7: Association between sociodemographic characteristics and the knowledge level of pap smear screening (N=369)

Variable		Knowledge level, *n* (%)			*n* (%)	*p*-value*
		Low	Average	High		
Age	19-20	47 (12.7)	29 (7.9)	10 (2.7)	86 (23.30)	< 0.01*
	21-22	72 (19.5)	56 (15.2)	45 (12.2)	173 (46.9)	
	23-24	21 (5.7)	33 (8.9)	56 (15.2)	110 (29.8)[a]	
Race	Malay	139 (37.7)	116 (31.4)	109 (29.5)	364 (98.6)	0.867
	Chinese	1 (0.3)	1 (0.3)	1 (0.3)	3 (0.8)	
	Others	0 (0.0)	1 (0.3)	1 (0.3)	2 (0.5)	
Kulliyyah	Nursing	26 (7.0)	31 (8.4)	39 (10.6)	96 (26.0)[b]	< 0.01*
	Medicine	9 (2.4)	16 (4.3)	24 (6.5)	49 (13.3)[b]	
	Pharmacy	28 (7.6)	31 (8.4)	18 (4.9)	77 (20.9)	
	Dentistry	27 (7.3)	14 (3.8)	14 (3.8)	55 (14.9)	
	Allied Health	41 (11.1)	20 (5.4)	14 (3.8)	75 (20.3)	
	Science	9 (2.4)	6 (1.6)	2 (0.5)	17 (4.6)	
Year of Study	1	48 (13.0)	30 (8.1)	11 (3.0)	89 (24.1)	< 0.01*
	2	32 (8.7)	21 (5.7)	19 (5.1)	72 (19.5)	
	3	41 (11.1)	37 (10.0)	33 (8.9)	111 (30.1)	
	4	19 (5.1)	30 (8.1)	48 (13.0)	97 (26.3)[c]	
Residency	Rural	49 (13.3)	42 (11.4)	36 (9.8)	127 (34.4)	0.866
	Urban	91 (24.7)	76 (20.6)	75 (20.3)	242 (65.6)	
Marital Status	Single	136 (36.9)	118 (32.0)	109 (29.5)	363 (98.4)	0.192
	Married/Divorced	4 (1.1)	0 (0.0)	2 (0.5)	6 (1.6)	
Family income	<RM 2000	24 (6.5)	26 (7.0)	17 (4.6)	67 (18.2)	0.755
	RM 2001 - RM 3500	20 (5.4)	13 (3.5)	17 (4.6)	50 (13.6)	
	RM 3501 - RM 5000	17 (4.6)	18 (4.9)	21 (5.7)	56 (15.2)	
	RM 5001 - RM 6500	13 (3.5)	12 (3.3)	10 (2.7)	35 (9.5)	
	>RM 6501	66 (17.9)	49 (13.3)	46 (12.5)	161 (43.6)	
Personal history of cancer	Yes	1 (0.3)	1 (0.3)	0 (0)	2 (0.5)	0.642
	No	139 (37.7)	117 (31.7)	111 (30.1)	367 (99.5)	
Personal history of cervical cancer	Yes	0 (0)	0 (0)	0 (0)	0 (0)	-
	No	140 (37.9)	118 (32.0)	111 (30.1)	369 (100.0)	
Family history of cancer	Yes	37 (10.0)	27 (7.3)	25 (6.8)	89 (24.1)	0.718
	No	103 (27.9)	91 (24.7)	86 (23.3)	280 (75.9)	
Family history of cervical cancer	Yes (First degree)	2 (0.5)	0 (0)	0 (0)	2 (0.5)	0.497
	Yes (Second degree)	6 (1.6)	6 (1.6)	5 (1.4)	17 (4.6)	
	No	132 (35.8)	112 (30.4)	106 (28.7)	350 (94.9)	

*Chi square test, *p*-value<0.05

Bonferroni post hoc test: [a]age 23-24 years old are significantly different, [b]Kulliyyah of Nursing and Kulliyyah of Medicine are significantly different, [c]year 4 are significantly different

Association Between Sociodemographic Characteristics and The Attitude Level of Cervical Cancer and Pap Smear Screening

Table 8 showed that there is a significant association between kulliyyah (*p*=0.019), family history of cancer (*p*<0.001) and family history of cervical cancer (*p*=0.041) toward attitude level of cervical cancer (*p*-value<0.05). For attitude level of pap smear screening as shown in Table 9, there is a significant association between year of study (*p*=0.033) and family history of cervical cancer (*p*=0.030) towards attitude level of pap smear screening (*p*-value<0.05).

Table 8: Association between sociodemographic characteristics and the attitude level of cervical cancer (N=369)

Variable		Attitude level, *n* (%)			*n* (%)	*p*-value*
		Low	Average	High		
Age	19-20	34 (9.4)	30 (8.1)	22 (6.0)	86 (23.30)	0.061
	21-22	75 (20.3)	59 (16.0)	39 (10.6)	173 (46.9)	
	23-24	31 (8.4)	39 (10.6)	40 (10.8)	110 (29.8)	
Race	Malay	139 (37.7)	126 (34.1)	99 (26.8)	364 (98.6)	0.463
	Chinese	0 (0.0)	1 (0.3)	2 (0.5)	3 (0.8)	
	Others	1 (0.3)	1 (0.3)	0 (0.0)	2 (0.5)	
Kulliyyah	Nursing	29 (7.9)	34 (9.2)	33 (8.9)	96 (26.0)	0.019*
	Medicine	12 (3.3)	18 (4.9)	19 (5.1)	49 (13.3)	
	Pharmacy	40 (10.8)	26 (7.0)	11 (3.0)	77 (20.9)	
	Dentistry	24 (6.5)	15 (4.1)	16 (4.3)	55 (14.9)	
	Allied Health	26 (7.0)	29 (7.9)	20 (5.4)	75 (20.3)	
	Science	9 (2.4)	6 (1.6)	2 (0.5)	17 (4.6)	
Year of Study	1	37 (10.0)	29 (7.9)	23 (6.2)	89 (24.1)	0.317
	2	33 (8.9)	25 (6.8)	14 (3.8)	72 (19.5)	
	3	42 (11.4)	37 (10.0)	32 (8.7)	111 (30.1)	
	4	28 (7.6)	37 (10.0)	32 (8.7)	97 (26.3)	
Residency	Rural	44 (11.9)	45 (12.2)	38 (10.3)	127 (34.4)	0.593
	Urban	96 (26.0)	83 (22.5)	63 (17.1)	242 (65.6)	
Marital Status	Single	138 (37.4)	128 (34.7)	97 (26.3)	363 (98.4)	0.061
	Married/Divorced	2 (0.5)	0 (0.0)	4 (1.1)	6 (1.6)	
Family income	<RM 2000	17 (4.6)	29 (7.9)	21 (5.7)	67 (18.2)	0.106
	RM 2001 - RM 3500	16 (4.3)	15 (4.1)	19 (5.1)	50 (13.6)	
	RM 3501 - RM 5000	26 (7.0)	20 (5.4)	10 (2.7)	56 (15.2)	
	RM 5001 - RM 6500	16 (4.3)	8 (2.2)	11 (3.0)	35 (9.5)	
	>RM 6501	65 (17.6)	56 (15.2)	40 (10.8)	161 (43.6)	
Smoking	Yes	1 (0.3)	0 (0.0)	0 (0.0)	1 (0.3)	0.44
	No	139 (37.7)	128 (34.7)	101 (27.4)	368 (99.7)	
Personal history of cancer	Yes	1 (0.3)	0 (0)	1 (0.3)	2 (0.5)	0.562
	No	139 (37.7)	128 (34.7)	100 (27.1)	367 (99.5)	
Personal history of cervical cancer	Yes	0 (0)	0 (0)	0 (0)	0 (0)	-
	No	140 (37.9)	128 (34.7)	101 (27.4)	369 (100.0)	
Family history of cancer	Yes	33 (8.9)	44 (11.9)	12 (3.3)	89 (24.1)	<0.001*
	No	107 (29.0)	84 (22.8)	89 (24.1)	280 (75.9)	
Family history of cervical cancer	Yes (First degree)	0 (0)	2 (0.5)	0 (0)	2 (0.5)	0.041*
	Yes (Second degree)	6 (1.6)	10 (2.7)	1(0.3)	17 (4.6)	
	No	134 (36.3)	116 (31.4)	100 (27.1)	350 (94.9)	

*Chi square test, *p*-value<0.05

Table 9: Association between sociodemographic characteristics and the attitude level of pap smear screening (N=369)

Variable		Attitude level, *n* (%)			*n* (%)	*p*-value*
		Low	Average	High		
Age	19-20	31 (8.4)	30 (8.2)	24 (6.5)	86 (23.30)	0.284
	21-22	66 (17.9)	65 (17.7)	42 (11.4)	173 (46.9)	
	23-24	31 (8.4)	53 (14.4)	26 (7.1)	110 (29.8)	
Race	Malay	127 (34.5)	146 (39.7)	90 (24.5)	364 (98.6)	0.122
	Chinese	1 (0.3)	2 (0.5)	0 (0.0)	3 (0.8)	
	Others	0 (0.0)	0 (0.0)	2 (0.5)	2 (0.5)	
Kulliyyah	Nursing	25 (6.8)	41 (11.1)	29 (7.9)	96 (26.0)	0.053
	Medicine	15 (4.1)	16 (4.3)	18 (4.9)	49 (13.3)	
	Pharmacy	36 (9.8)	24 (6.5)	17 (4.6)	77 (20.9)	
	Dentistry	18 (4.9)	23 (6.3)	14 (3.8)	55 (14.9)	
	Allied Health	29 (7.9)	34 (9.2)	12 (3.3)	75 (20.3)	
	Science	5 (1.4)	10 (2.7)	2 (0.5)	17 (4.6)	
Year of Study	1	33 (9.0)	31 (8.4)	24 (6.5)	89 (24.1)	0.033*
	2	35 (9.5)	26 (7.1)	11 (3.0)	72 (19.5)	
	3	32 (8.7)	44 (12.0)	35 (9.5)	111 (30.1)	
	4	28 (7.6)	47 (12.8)	22 (6.0)	97 (26.3)	
Residency	Rural	47 (12.8)	46 (12.5)	33 (9.0)	127 (34.4)	0.573
	Urban	81 (22.0)	102 (27.7)	59 (16.0)	242 (65.6)	
Marital Status	Single	127 (34.5)	144 (39.1)	91 (24.7)	363 (98.4)	0.405
	Married/Divorced	1 (0.3)	4 (1.1)	1 (0.3)	6 (1.6)	
Family income	<RM 2000	21 (5.7)	29 (7.9)	17 (4.6)	67 (18.2)	0.118
	RM 2001 - RM 3500	16 (4.3)	19 (5.2)	15 (4.1)	50 (13.6)	
	RM 3501 - RM 5000	17 (4.6)	23 (6.3)	16 (4.3)	56 (15.2)	
	RM 5001 - RM 6500	8 (2.2)	12 (3.3)	15 (4.1)	35 (9.5)	
	>RM 6501	66 (17.9)	65 (17.7)	29 (7.9)	161 (43.6)	
Smoking	Yes	1 (0.3)	0 (0.0)	0 (0.0)	1 (0.3)	0.391
	No	127 (34.5)	148 (40.2)	92 (25.0)	368 (99.7)	
Personal history of cancer	Yes	0 (0)	2 (0.5)	0 (0)	2 (0.5)	0.227
	No	128 (34.7)	147 (39.8)	92 (24.9)	367 (99.5)	
Personal history of cervical cancer	Yes	0 (0)	0 (0)	0 (0)	0 (0)	-
	No	128 (34.7)	149 (40.4)	92 (24.9)	369 (100.0)	
Family history of cancer	Yes	33 (8.9)	39 (10.6)	17 (4.6)	89 (24.1)	0.344
	No	95 (25.7)	110 (29.8)	75 (20.3)	280 (75.9)	
Family history of cervical cancer	Yes (First degree)	1 (0.3)	1 (0.3)	0 (0)	2 (0.5)	0.030*
	Yes (Second degree)	11 (3.0)	1 (0.3)	5 (1.4)	17 (4.6)	
	No	116 (31.4)	147 (39.8)	87 (23.6)	350 (94.9)	

*Chi square test, *p*-value<0.05

DISCUSSION

Knowledge on Cervical Cancer

This study demonstrated that the majority of the female students has average knowledge of cervical cancer (35.8%). In addition, most of the participants have heard about cervical cancer, aware that it may be caused by HPV and one of the main fatal cancers in women. The participants knew several risk factors for cervical cancer, including, family history, smoking, poor vaginal hygiene, multiple sexual partners and early starts of sexual activity. However, majority of the participants also unaware that other risk factors of cervical cancer such as consumption of high fat diet, mothers with lesser number of children, miscarriage and multiparity. This could be attributed by the majority of the participants are single and unmarried. A previous study in Malaysia also reported that participants are less

aware that multiparity as one of the risk factors for cervical cancer (16).

Identifying the symptoms of cervical cancer in the early stage are crucial to increase the chances of survival and thus, it is necessary for women to have knowledge regarding its symptoms. In this study, majority of the participants knew the symptoms of cervical cancer, including weight loss, difficulty and pain during urination, abnormal, smelly and blood vaginal discharge, longer and irregular menstrual bleeding, discomfort or pain during sex, bleeding after sexual activity and after menopause. The knowledge of cervical cancer symptoms might be due to the participant's background as health sciences students. Thus, the barriers like illiteracy, poverty, fear of cancer detection, and ignorance are some of the most common reasons that need to be encountered to reduce the prevalence of cervical cancers (19).

In Malaysia, the government projected a maximum number of schoolgirls to be vaccinated in the year 2016 to reduce the chances of HPV among young women (20). Despite that, the participants in this study did not know that the vaccination should be taken before sexual activity and vaccinating males can also reduce the incidence of cervical cancer. Previous studies also reported that only 14.8% of respondents believed that vaccination of males could lower HPV infection and, in turn, lower cervical cancer occurrences (15). Since HPV is commonly associated with cervical cancer, there is a perception that this virus only affects women. However, some developing countries have already initiated HPV vaccination programs for men as well.

Knowledge on Pap Smear Screening

In this study, most participants have heard about pap smear screening from mass media and the internet, likely because they spend much of their leisure time on social media and online. The participants also know the purpose of pap smear screening as the early detection of cervical cancer and the procedure involves the use of instrument to collect cervical calls via the vagina. Majority of the participants also know that the interval of pap smear testing is in every 1 to 3 years with 10 days after menstruation as the optimal time for pap smear screening. Most of the participants in this study also disagreed that pap smear should be discontinued after menopause.

Despite that, most of participants in this study reported to have low knowledge of pap smear (37.9%). Approximately 55.8% of participants believe that a woman who has had a hysterectomy no longer needs to undergo pap smears, which is incorrect. Pap smear test is still needed even after a hysterectomy procedure. Previous study also reported that majority of their participants are unsure about this question (15). Regular pap smear tests may still be advised as an early detection tool to monitor for any developing cancer or precancerous change if woman had a partial hysterectomy or a whole hysterectomy (21). This study also revealed that most participants believed that a Pap smear is unnecessary in the future if the initial result is normal, that it must be administered exclusively by a doctor, and were unaware of how frequently a healthy woman should undergo the test. These findings suggest a lack of adequate knowledge about Pap smear screening. Knowledge, beliefs and attitudes may hinder women from receiving health services like pap smears screening test (22).

Attitude on Cervical Cancer

Based on the data in this study, majority of the participants agreed that having multiple sexual partners, contraceptive pill and smoking are risk factor for cervical cancer, cervical cancer is transmittable through sexual intercourse, HIV positivity increases the chance of getting cervical cancer and cervical cancer is a major health problem for female of reproductive age group. Previous study also reported that majority of the participants agreed that the transmissibility of cervical cancer through intercourse, the impact of HIV positivity on cervical cancer, the use of oral contraceptives on cervical cancer and smoking could be a cause of cervical cancer (23). Additionally, it is also reported that majority participants among reproductive age group women in Gondar town, North West Ethiopia agreed that multiple sexual partners and an early marriage are both risk factors for cervical cancer (14). The participant in this study also agreed that it is possible to detect cervical cancer with early screening before symptoms appear, early detection of cervical cancer is good for treatment outcome and it is very important to do regular pap smear. This shows that the participants are having good attitude in the

preventive measures and do not hesitate to take the tests to reduce the later diagnosis of the disease (9). Similar result was seen in previous study which most of the participants ready to seek medical treatment if they became infected and tried to follow the guidelines for illness prevention (15). Most of the participants also have positive attitude towards HPV vaccination maybe because of no religions forbids vaccines, and some may view it as an obligation to save lives.

Attitude on Pap Smear Screening

In the data presented in this study, majority of the participants agreed to take HPV vaccine despite of majority of them reported that they will feel embarrassed if a male doctor ran the test, painful to have a pap smear, it is an unpleasant and embarrassing process, difficult to take time off to go for pap smear and to get to the pap smear clinic, being busy is a barrier to pap smear, they are afraid that something wrong will be detected if they go for pap smear and they would be worried if they was found to have early signs of cancer. A previous study also reported that the majority of the participants expressed their feelings of embarrassment if examined by a male doctor and had been denied screening if they were single, which is understandable given due to the religious and conservative aspects of this culture in this country (17).

Most of the participants also disagreed to going for the screening test if they are single and a greater number of participants also agreed that they feel shy, embarrassed and reluctant during pap smear test examinations, pap smear test is very strange for them, they are afraid the results may show that they are positive for cancer, they do not know the suitable age for pap smear examination, they lack information and awareness about cervical cancer and pap smear screening tests, insufficient information given by health care personnel on cervical cancer and pap smear test, they do not know the interval between pap smear screening tests and where to go for a pap smear test. Previous studies also reported that their participants lacked information and awareness about cervical cancer and pap smear (18). This shows that they did not have a correct understanding when it comes to the significance of pap smear screening. These findings also showed that women are still facing many practical and psychological barriers which stop them from getting through with the screening (24). Thus, these can lead to an increase of the prevalence number of people suffering from cervical cancer and the mortality rate.

Association Between Sociodemographic Characteristics and The Knowledge Level of Cervical Cancer and Pap Smear Screening

Age, kulliyyah and year of study are found to be significantly associated with level of knowledge towards cervical cancer and pap smear in this study. The results show that the level of knowledge of pap smear for age 23-24 years old are significantly different compared to others. Previous study also reported that older respondents knew more about pap smear screening (15). The level of knowledge on cervical cancer and pap smear are significantly different in Kulliyyah of Nursing and Kulliyyah of Medicine compared to other kulliyyah. Previous study conducted in India reported that majority of their participants had good knowledge about cervical cancer are among nursing students in a rural area of Andhra Pradesh (25). Another study also reported high level of knowledge towards cervical cancer among medical students from medical college in Belagavi, India (26). Undergraduate nursing students in South Nigeria also reported to had good knowledge on cervical cancer screening (27). The higher knowledge among medical and nursing students may be contributed by their academic syllabus and exposure during clinical posting. Academic syllabus of medical and nursing programmes typically includes education on causes, treatment prevention of disease. In addition, clinical posting also elevates their understanding and knowledge on related health issues.

It is also reported that the level of knowledge towards cervical cancer and pap smear for year 4 is significantly different compared to other years. A study conducted reported that year 4 students in Saudi university scored significantly higher than other groups (28). This may be attributed to students gaining more in-depth knowledge through classroom learning, case studies, and clinical postings, which enhance their understanding of the importance of early detection methods such as Pap smear screening. A previous studies conducted among women of reproductive age between 15 to 49 years in Magu district hospital, Lake Zone Tanzania also reported that secondary

education or higher are significantly associated with higher knowledge of cervical cancer (29). This indicate that individuals with secondary education are provided with better access to information and are more likely to be exposed to information about diseases, such as cervical cancer, along with its prevention and treatment options.

Association Between Sociodemographic Characteristics and The Attitude Level of Cervical Cancer and Pap Smear Screening

This study had demonstrated a significant association between kulliyyah, family history of cancer and family history of cervical cancer towards attitude level of cervical cancer. People who do have family history of cancer and particularly cervical cancer have attained first-hand knowledge of the disease which also helps them maintain a positive attitude towards the screening and treatment of the disease (30). They understand that these screening is a way to help individuals who are going through the disease and will result in providing positive outcomes. Previous study also indicated that women who know someone with cervical cancer are significantly associated with higher level knowledge on cervical cancer (29).

For attitude level of pap smear, there is a significant association between year of study and family history of cervical cancer towards attitude level of pap smear. This is also reported in previous study where there are significant differences in the attitude of respondents toward cervical cancer screening among the different years of study. It is reported that year 1 students are less likely to have a positive attitude toward cervical cancer screening compared to year 4 and 5 students among 8 colleges and 2 universities in Dire Dawa City, Eastern Ethiopia, Africa. This indicated that as the year of study progressed, the positive perception of cervical cancer screening also improved (31).

The data obtained from this study also reported there is no association between kulliyyah and attitude level towards pap smear. Despite that, a previous study reported that there is an association between course and attitude toward pap smear (32). It is essential for university students to adopt a positive attitude toward Pap smear screening, not only for their own well-being but also for the health of the broader community, as most university students are in their premarital years and will play a key role in shaping the future of society (33). Additionally, it is important to spread awareness among students of different backgrounds because they will distribute information and promote screening in their particular disciplines (34). Therefore, it is essential to deliver knowledge about cervical cancer through health education programs, as late diagnosis and poor prognosis can contribute to higher mortality rates associated with the disease.

CONCLUSION

The findings of this study showed that most participants had average knowledge of cervical cancer and attitude toward pap smear, but low knowledge of pap smear and low attitude toward cervical cancer. Furthermore, a significant association is identified between attitude level of cervical cancer and pap smear with a family history of cervical cancer, indicating that only participants with prior exposure demonstrated a heightened attitude. Therefore, it is imperative to implement targeted educational programs or health promotion that aim to elevate the knowledge and awareness among individuals without prior exposure to cervical cancer, ensuring that they will understand the importance of early detection of cervical cancer and pap smear screening. By broadening outreach and tailoring messages to various demographics, a more proactive approach to cervical cancer prevention and screening can be fostered among a broader audience.

CONFLICTS OF INTEREST

The authors declare that they have no competing interests to declare with regard to this work.

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ETHICAL CLEARANCE

We obtained approval from the Kulliyyah of Nursing Postgraduate and Research Committee (KNPGRC), IIUM Kuantan Campus and IIUM Research Committee (IREC) with approval number: IREC 2023-KON/NURF46.

AUTHORS CONTRIBUTION

NZA: data collection, writing, editing and finalizing the manuscript with support of literature content.
NBAES: data collection, drafting the manuscript and data analysis.
NAUS: data analysis.
NO & MLMI: review the manuscript and approved the final version.

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