

Effect of an Intervention on Knowledge and Awareness of Cervical Cancer among University Students
*(Kesan Intervensi ke atas Pengetahuan dan Kesedaran tentang Kanser Serviks di kalangan Pelajar
 Universiti)*

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ABSTRACT

This study was a cross-sectional questionnaire study, where it conducted to analyzed knowledge and awareness among 288 students from Faculty of Health Science, Universiti Kebangsaan Malaysia aged 18 years old and above using a validated Cancer Awareness Measure (CAM) questionnaire. Participants were divided into two groups which were 144 involved in intervention and 144 as a control group. An intervention in the form of the educational brochure was developed and measures after two weeks from pre-intervention. The data were analyzed using SPSS version-25. In general, most of the participant had moderate to inadequate knowledge and attitudes towards cervical cancer in both groups during pre-intervention. Participant's knowledge of cervical cancer was comparable at pre-intervention but was significant increases ($p < 0.05$) at post-intervention in the intervention group compared to the control group for every variable that has been measured. Despite the knowledge and awareness of cervical cancer were increasing, the recommended age for vaccination and Pap smear screening remains low even after the intervention. Hence, it is suggested for the university students to escalate the knowledge regarding the appropriate age for vaccination and screening for cervical cancer.

Keywords: Cervical cancer, knowledge, awareness, intervention.

ABSTRAK

Kajian ini adalah satu soal selidik keratan rentas, di mana ia dijalankan untuk menganalisis pengetahuan dan kesedaran di kalangan 288 pelajar dari Fakulti Sains Kesihatan, Universiti Kebangsaan Malaysia yang berumur 18 tahun dan ke atas menggunakan borang soal selidik Cancer Awareness Measure (CAM). Para peserta telah dibahagikan kepada dua kumpulan iaitu 144 dalam kumpulan intervensi dan 144 dalam kumpulan kawalan. Intervensi dalam bentuk brosur pendidikan telah dibangunkan dan diukur selepas dua minggu dari pra-intervensi. Data dianalisis menggunakan SPSS versi 25. Secara umum, sebahagian besar daripada peserta mempunyai tahap pengetahuan dan sikap sederhana kepada rendah terhadap kanser serviks di kedua-dua kumpulan semasa pra-intervensi. Pengetahuan peserta dalam kanser serviks adalah setara di pra-intervensi tetapi meningkat secara signifikan ($p < 0.05$) di pasca-intervensi dalam kumpulan intervensi berbanding dengan kumpulan kawalan bagi setiap pemboleh ubah yang telah diukur. Walaupun pengetahuan dan kesedaran kanser serviks meningkat, usia yang disyorkan untuk vaksinasi dan pemeriksaan Pap smear masih kekal rendah walaupun selepas intervensi. Oleh itu, disarankan kepada pelajar universiti untuk meningkatkan pengetahuan tentang usia yang sesuai untuk vaksinasi dan pemeriksaan pengesanan kanser serviks.

Kata kunci: Kanser servik, pengetahuan, kesedaran, intervensi.

INTRODUCTION

Cervical cancer (CC) is known as most malignancies among women, regardless of their age or lifestyle, and become a big problem in this country. This cancer was also known as a "hidden or silent" because of its diagnosis after a biopsy of pre-cancerous. According to the International Agency for Research on Cancer (2018), the statistic shows the highest cancers among Malaysian women were cervical cancer and listed as the top three. Based on the WHO GLOBOCAN 2018, cervical cancer contributes 7.2% cases over 15 515 729 female population in all ages. The new cases and deaths of cervical cancer were reported in 2018, which is 4.08% and 3.83%. The incidence rates rose at the age of 30 years and peaked between 60-69 years old and the deaths are rare among young women (Zaridah, 2014).

In Malaysia, government hospitals contribute to 12.6%, whereas private hospitals are 26.7% in 2016 of all death's due to cancer as the fourth leading cause of death. There has been an increasing trend from 2007-2016 from 11.3% in 2007 to 12.6% in 2016 (MySCan, 2018). A total of 4015 of cervical cancer were reported in 2018 and the highest age was occurred among 45-54 years old which contribute to 1244 cases. The five-year overall survival rates of cervical cancer were 46.9% which consider as low survival rate. The highest survival rate is among Chinese which is 57.7%, followed by Indians with 47.0% and Malays with 44.8% but the highest incidence rate of cervical cancer was seen among ethnic Chinese which is 28.8 over 100,000 followed by Indians and Malays (Malaysian National Cancer Registry Report, 2003).

In Malaysia, the various program was done to gives the awareness regarding cervical cancer, for instances, free HPV vaccines for the year of birth 1990-1996, Pap smear screening, education through campaign and advertisement and video animation. This program has dramatically opened the public eyes the importance of rising cervical cancer awareness. More than ten researchers were done to evaluate the public's knowledge and level of awareness. However, the statistic of cervical cancer shows that the incidence of cervical in Malaysia is still increasing, and there is insufficient awareness of this cancers, including its symptoms, risk factors, and screening methods, are remains low among Malaysian women populations.

Hence, this study will emphasize the improvement and importance of knowing cervical cancer awareness. This study will also develop a new intervention in terms of prevention and education about cervical cancer. At the same time, this will help to learn and gain knowledge of cervical cancer awareness.

There are many benefits from this survey, such as allows comparisons between different groups of the population, monitors the impact of interventions, and can monitor or track how awareness changes over time.

METHODS AND MATERIALS

A cross-sectional survey method was conducted between February 2019 until June 2019 to measure the level of knowledge and awareness of cervical cancer among undergraduates' students in Faculty Health Science, UKM and at the same time develop a new approach of intervention and lastly to evaluate the effectiveness of the intervention. The research was conducted at the public university, which is Universiti Kebangsaan Malaysia in Kuala Lumpur, Malaysia. This study has received ethics approval (NN-2019-058).

The criteria for sampling in this research consisted of female and male students of Faculty Health Science, UKM KL at the aged of 18 and above and good in English. The exclusion criteria were diagnostic imaging and radiotherapy students because all of them were in the oncology field and the data obtained will be interfering with other data. A convenient sampling method was established to select the sample comprising of 1147 students from the list name of Faculty Health Science students. An email and phone number are chosen from the sampling. Out of 1147, a total of 288 sample size was invited to complete the questionnaire of cancer awareness measure (CAM) using a face-to-face and google form.

A structured and multiple choice of the questionnaire in the English version was used in this study using the Cervical Cancer Awareness Measure (Cervical CAM). The UCL Health Behaviour Research Centre was introduced to Cervical CAM. The survey instrument was got permission from Cancer Research UK and the validated questionnaire was done by the (Kline, 1932) where the internal reliability test is above 0.7 satisfactory for all components. In Malaysia, the reliability test in ten students using this questionnaire was done and the Cronbach's alpha result is 0.91.

Section A of google form survey consists of socio-demographic information that will be used in the analyses, which include the age, courses (Biomedical science, Audiology, Optometry, Occupational therapy, Physiotherapy, Nutrition, Dietetic, Speech Therapy, Environmental Health, Forensic Science), year (1, 2, 3, 4), ethnic (Malay, Chinese, Indian, others), language spoken (Malay, Chinese, Tamil, English, others), marital status (single, married, divorced, others), living arrangement (own house, renting, college, others),

transport, occupation(employed part-time, full-time studying) and cancer history (you, family member).

In section B was based on the knowledge, awareness of cervical cancer and the effectiveness of interventions designed to the target through pre-and post-survey. The questionnaire comprises nine main questions which include two questions of 'open' and 'closed' warning signs, 1 question of seeking medical help, 1 question of age at risk, two questions of 'open' and 'closed' risk factors, 1 question of confidence detecting cervical cancer symptom, 1 question of the screening programme and 1 question of the vaccination programme. Open (recall) questions used to assess the current knowledge that can be brought to mind and reflect what the usual answer is and it depends on the memory. Closed(recognition) questions avoid the recall task but can be biased by the respondent from the listed and encourage to guessing. For the questions 2,8 and 9, three-point Likert-scale was used while for question 6, five-point Likert-scale was used to reflect the respondent's opinion on cervical cancer awareness. Questions 3, 4 and 7 are the multiple-choice question. For correct answer on Yes, No, and Don't Know was coding as '3', '2', and '1', while in eleven questions for the respondent opinion on risk factors for cervical cancer, for strongly disagree response was '1', followed by disagree as '2', not sure as '3', agree as '4', and lastly strongly agree as '5'. Regarding the negative response, the coding system also was applied with the highest values, where for other answer was '12', nothing as '13', refusal as '98' and don't know as '99'.

The intervention session was done in 3 phases. Phase I: The tool of the intervention was done by creating an educational brochure. The information and communication were produced by the researchers and the contents in the brochure were written in the English language and was distributed to all members in the intervention group after the pre-intervention. Phase II: This was the second phase, which is a pre-intervention session, where the data was collected using the Cervical CAM questionnaires by interviewed and using online google form which consisting of structured, multiple-choice, open and closed questions. The respondents also were informed of the nature of this study with full confidentiality and informed consents were taken. Participants were categorized into two groups which were intervention and control. The first 144 of the participants were in the intervention group while the rest of 144 in the control group. For the intervention group, the brochure was given to the participant to read before post-intervention. Phase III: After two weeks of phase II, a post-intervention survey was conducted to evaluate the effect of educational intervention. The same

instrument was used during the pre-intervention for post-intervention in both groups. Figure 1 summarize the flowchart of the methodology.

Data were collected through using interview face-to-face and using the internet through the google form, structured and multiple choice of the questionnaire and analyzed using the SPSS version-25. The descriptive frequency analysis was presented with the chart, figures, and table to demonstrate the frequency and percentage of the demographic results. Chi-square test was used to analyze the relationship of variables between pre-intervention and post-intervention with p -value < 0.05 was considered significant statistically. The Wilcoxon-signed rank test was used for the ranking question to examine the relationship between pre-intervention and post-intervention with p -value < 0.05 .

RESULTS & DISCUSSION

Out of 288 participants of undergraduates' students were approached to answer these questionnaires, but only 200 participants were willing to participate in the survey until finished. During pre-intervention, the total of the participant who had answered the questionnaires is 288. However, during post-intervention, 40 participants refused to participate because they were busy with assignments, clinical, final year project, quiz, examination, 25 participants were not interested in continuing this study without any specific reason and 23 participants could not be contacted after three attempts. Data collected during pre-intervention for the refused participant were deleted during post-intervention.

The demographic characteristics of this study were shown in Table 1. The mean age was 21.97 ± 1.794 years old. From a total of 288 participants, 38 (13.2%) are males, while 250 (86.8%) are female students. Majority of the participant are from biomedical science (30.9%), followed by optometry (10.8%), environmental health (10.4), occupational and speech therapy (9.0%), audiology (8.0%), nutrition (7.6%), dietetic (6.6%), physiotherapy (4.9%) and forensic science (2.8%). Most of them are from year one and three (27.1%) followed by year four (24.3%) and year two (21.5%). Malays are the domain races in this study with (76.0%), followed by Chinese (15.6%), Indian (5.6%) and others (2.8%). Besides that, most of them are single (99.3%) and only two students are married (0.7%). Most of the students were staying at the college (84.0%) and only 15.3% of students who had transport. 2.1% from them working as a part-time, while the others are full-time study. The cancer history, where family member gives the highest number of cases compare to own students

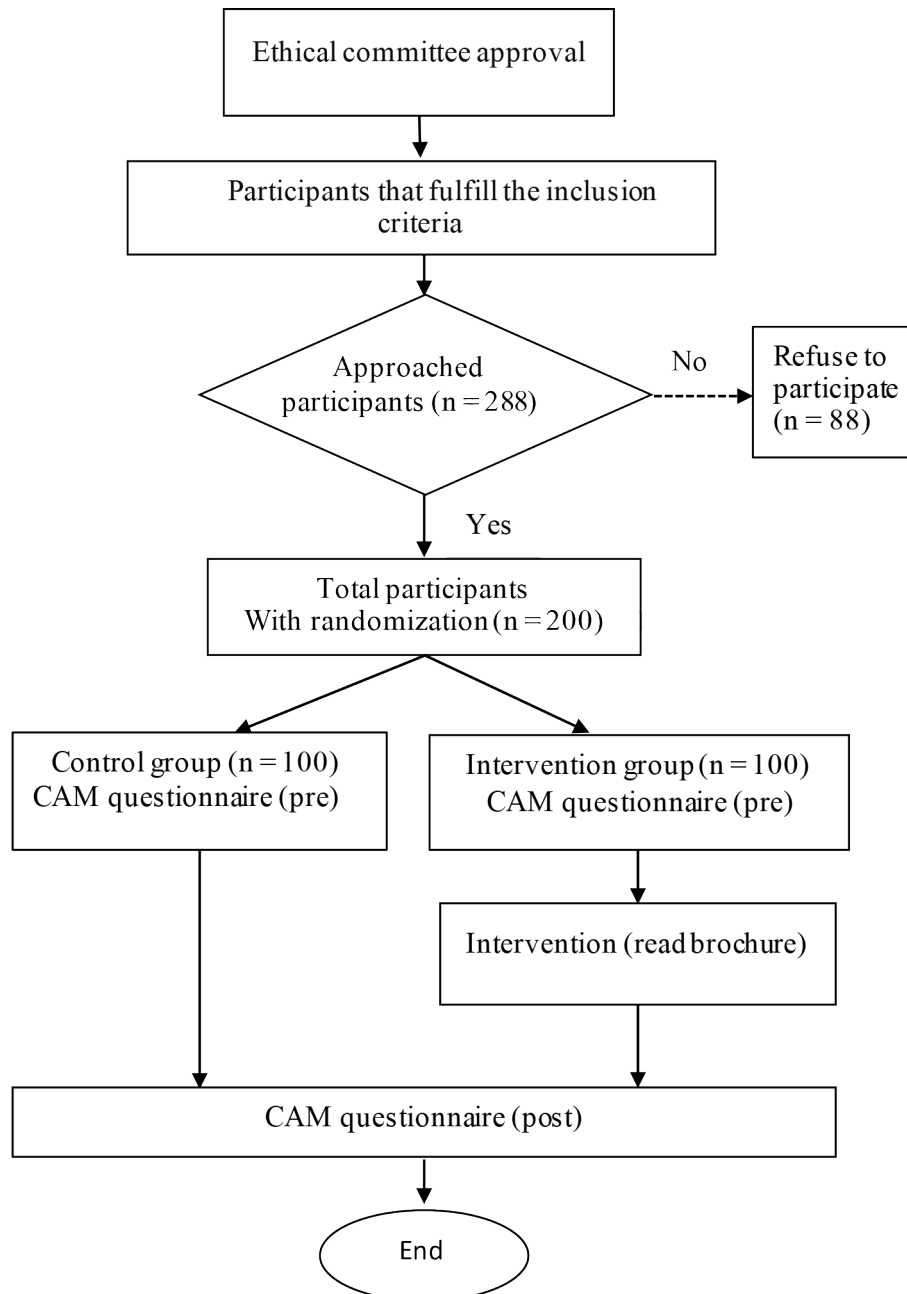


FIGURE 1. Flowchart of the methodology

with 32.0% over 1.0%.

Recall warning signs and symptoms (open question) was good for the menstrual periods that are heavier or longer than usual, where more than 30 participants known very well in both groups during pre-intervention. Unfortunately, recall for other symptoms was very poor such as having bleeding during or after sex in the control group, while in the intervention group, persistent lower back pain shows an unfortunate result. Some of the participants in both groups expressed they

do not have any knowledge regarding the warning signs of cervical cancer. During the post-intervention session, participants in the intervention group show a double number of understanding about the warning signs of cervical cancer. Most of them show a positive result and could recall the signs. In the control group, there is a slight increase in the number of participants could recall the warning signs and some of them still lack knowledge regarding cervical cancer. Figure 2 shows recall for each of the warning signs in the control

TABLE 1. Socio-demographic characteristics of sample (n = 288, mean age = 21.97 ± 1.794)

Variables	Frequency (n)	Percentage (%)
Gender		
Male	38	13.2
Female	250	86.8
Courses		
Biomedicine	89	30.9
Audiology	23	8.0
Optometric	31	10.8
Occupational therapy	26	9.0
Physiotherapy	14	4.9
Nutrition	22	7.6
Dietetic	19	6.6
Speech Therapy	26	9.0
Environmental Health	30	10.4
Forensic Science	8	2.8
Year		
One	78	27.1
Two	62	21.5
Three	78	27.1
Four	70	24.3
Races		
Malay	219	76.0
Chinese	45	15.6
Indian	16	5.6
Others	8	2.8
Marital status		
Single	286	99.3
Married	2	0.7
Living arrangement		
College	242	84.0
Renting	32	11.1
Cancer history		
You	3	1
Family member	91	32

and intervention group.

Recognition (closed questions) gave a higher score than recall. By referring to table 2, all of the warning signs of cervical cancer during pre- and post-intervention among the control group was not significant with a p-value greater than 0.05. In the intervention group, seven from the warning signs listed was significant, where the p-value is less than 0.05. Only the sign of menstrual periods that are heavier or

longer was not significant after educational intervention with p-value 0.060.

Pre-intervention: For instances, only 29.5% of participants in the control group and 35.0% of the participants in the intervention group knew that vaginal bleeding between periods could be a sign of cervical cancer. 41.5% of the students in the control group and 39.0% of the students in the intervention group knew that persistent vaginal discharge that smells unpleasant

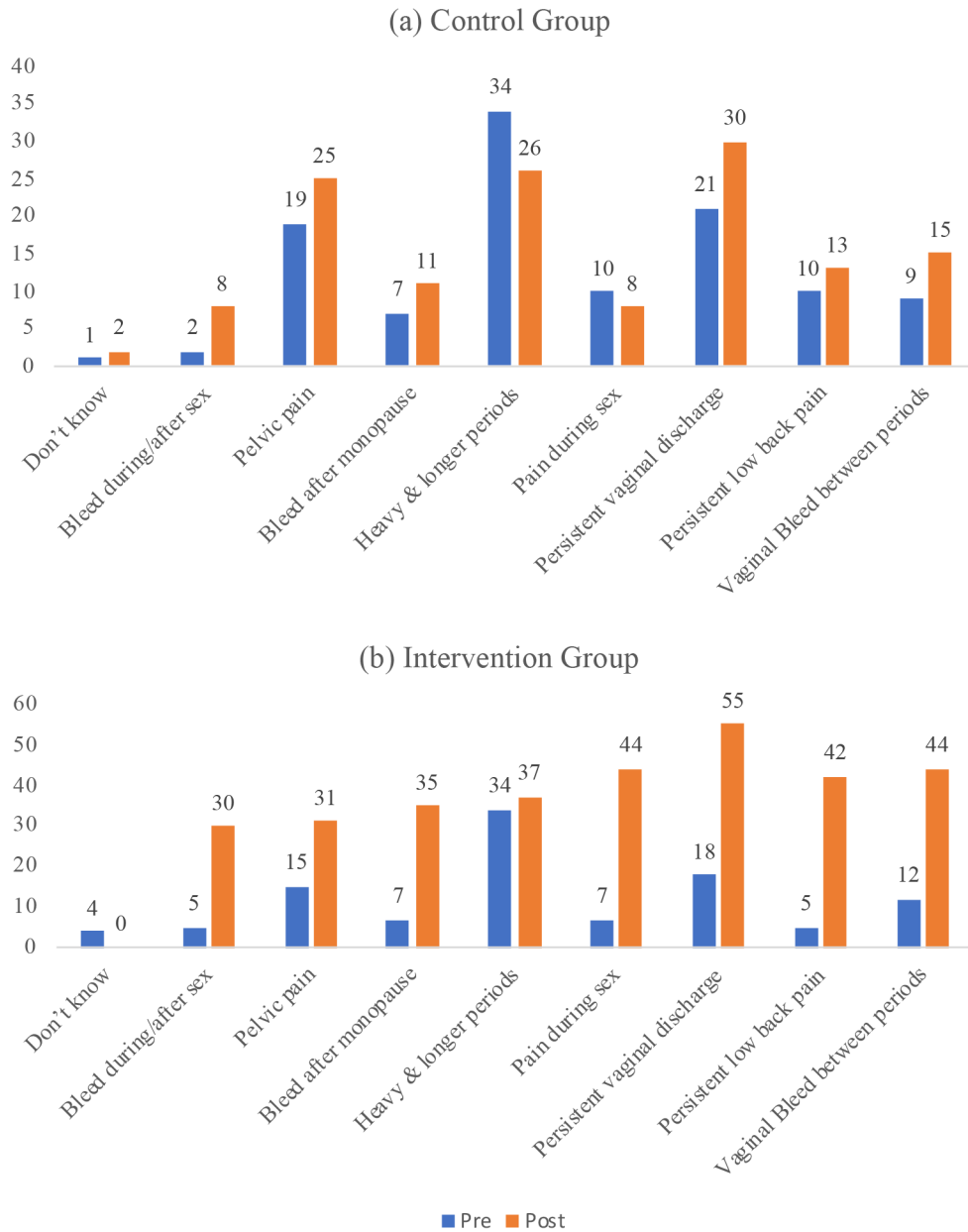


FIGURE 2. Recall of eight warning signs of cervical cancer in (a) control group and (b) intervention group of pre- and post-intervention.

is a sign of cervical cancer. 36.5% of the students in the control group and 37.5% of the students in the intervention group knew that the menstrual period that is heavier or longer than usual was associated with cervical cancer.

Post-intervention: There are no statistically significant differences among participants in the control group, where only 34.5% of participants knew that vaginal bleeding between periods could be a sign of cervical cancer ($\chi^2 = 2.865$, $p = 0.239$) and there are

statistically significant differences among participants in the intervention group, where 45.0% knew that vaginal bleeding between periods could be a sign of cervical cancer ($\chi^2 = 13.896$, $p = 0.001$). There is a significant difference among participants in the intervention group, where 48.5% of them knew that having persistent vaginal discharge that smells unpleasant could be a sign of cervical cancer ($\chi^2 = 19.063$, $p = 0.000$). 33.0% of those in the control group and 43.5% of those in intervention group knew that menstrual period that

TABLE 2. Recognition of eight cervical cancer warning signs in both group during pre- and post-intervention

Warning signs of cervical cancer	Pre-intervention, n (%)	Post-intervention, n (%)	Chi-square, P-values
<u>Control group</u>			
Vaginal bleeding between periods			
Yes	59 (29.5)	69 (34.5)	$\chi^2 = 2.865,$ $p = 0.239$
No	12 (6.0)	12 (6.0)	
Don't know	29 (14.5)	19 (9.5)	
Persistent lower back pain			
Yes	47 (23.5)	58 (29.0)	$\chi^2 = 2.621,$ $p = 0.270$
No	20 (10.0)	14 (7.0)	
Don't know	33 (16.5)	28 (14.0)	
Persistent vaginal discharge			
Yes	83 (41.5)	63 (31.5)	$\chi^2 = 10.529,$ $p = 0.005$
No	4 (2.0)	12 (6.0)	
Don't know	13 (6.5)	25 (12.5)	
Discomfort or pain during sex			
Yes	69 (34.5)	63 (31.5)	$\chi^2 = 10.529,$ $p = 0.005$
No	9 (4.5)	12 (6.0)	
Don't know	22 (11.0)	25 (12.5)	
Menstrual periods that are heavier			
Yes	73 (36.5)	66 (33.0)	$\chi^2 = 2.167,$ $p = 0.338$
No	17 (8.5)	17 (8.5)	
Don't know	10 (5.0)	17 (8.5)	
Vaginal bleeding post menopause			
Yes	69 (34.5)	75 (37.5)	$\chi^2 = 1.070,$ $p = 0.586$
No	9 (4.5)	6 (3.0)	
Don't know	22 (11.0)	19 (9.5)	
Persistent pelvic pain			
Yes	64 (32.0)	71 (35.5)	$\chi^2 = 1.303,$ $p = 0.521$
No	13 (6.5)	12 (6.0)	
Don't know	23 (11.5)	17 (8.5)	
Vaginal bleeding during/after sex			
Yes	60 (30.0)	60 (30.0)	$\chi^2 = 2.257,$ $p = 0.324$
No	14 (7.0)	8 (4.0)	
Don't know	26 (13.0)	32 (16.0)	
<u>Intervention group</u>			
Vaginal bleeding between periods			
Yes	70 (35.0)	90 (45.0)	$\chi^2 = 13.896,$ $p = 0.001$
No	8 (4.0)	5 (2.5)	
Don't know	22 (11.0)	5 (2.5)	

Persistent lower back pain			
Yes	54 (27.0)	84 (42.0)	$\chi^2 = 22.216,$ $p = 0.000$
No	15 (7.5)	8 (4.0)	
Don't know	31 (15.5)	8 (4.0)	
Persistent vaginal discharge			
Yes	78 (39.0)	97 (48.5)	$\chi^2 = 19.063,$ $p = 0.000$
No	6 (3.0)	3 (1.5)	
Don't know	16 (8.0)	0 (0.0)	
Discomfort or pain during sex			
Yes	81 (40.5)	94 (47.0)	$\chi^2 = 8.093,$ $p = 0.017$
No	6 (3.0)	1 (0.5)	
Don't know	13 (6.5)	5 (2.5)	
Menstrual periods that are heavier			
Yes	75 (37.5)	87 (43.5)	$\chi^2 = 5.626,$ $p = 0.060$
No	11 (5.5)	8 (4.0)	
Don't know	14 (7.0)	5 (2.5)	
Vaginal bleeding post menopause			
Yes	73 (36.5)	96 (48.0)	$\chi^2 = 20.315,$ $p = 0.000$
No	4 (2.0)	1 (0.5)	
Don't know	23 (11.5)	3 (1.5)	
Persistent pelvic pain			
Yes	70 (35.0)	94 (47.0)	$\chi^2 = 20.846,$ $p = 0.000$
No	6 (3.0)	3 (1.5)	
Don't know	24 (12.0)	3 (1.5)	
Vaginal bleeding during/after sex			
Yes	57 (28.5)	88 (44.0)	$\chi^2 = 24.111,$ $p = 0.000$
No	10 (5.0)	3 (1.5)	
Don't know	33 (16.5)	9 (4.5)	

is heavier or longer than usual is a sign of cervical cancer (control: $\chi^2 = 2.167$, $p = 0.338$; intervention: $\chi^2 = 5.626$, $p = 0.060$) but was not significant. Table 2 is the summarization of all warning signs of cervical cancer during pre- and post-intervention in both groups.

Figure 3 has summarized the participant's response when they have noticed the sign of cervical cancer during pre- and post-intervention. In the control group, there are no significant differences before and after the intervention where the percentage of participants who contact the doctor immediately or within 1 to 2 days were decreased, with Z value is -0.8222, p is 0.41222 and W is 1102. There is a significant difference among participants in intervention group before and after intervention where the Z value is -2.5457, W is 807.5, and p is 0.01078 because most of the participants will contact their doctor immediately

after noticing the sign of cervical cancer.

The question for this section was 'In the next year, who is most likely to develop cervical cancer in Malaysia?'. This question has an answer referring the current population statistic based on the journal by Zaridah S (2014) and Malaysian Study on Cancer Survival (Myscan). The high incidence rate of cervical cancer in Malaysia occurred in 45-54 years old. Only 17.0% during pre-intervention and 20.0% during post-intervention of participants in the control group had answered the correct age. The rest is incorrect. In the intervention group, a double increase of participants who answered the correct choice of age from 22.0% to 41.5% after post-intervention. About 8.5% who still answered incorrectly.

Recall (open question) during pre-intervention in control and intervention group was moderate for

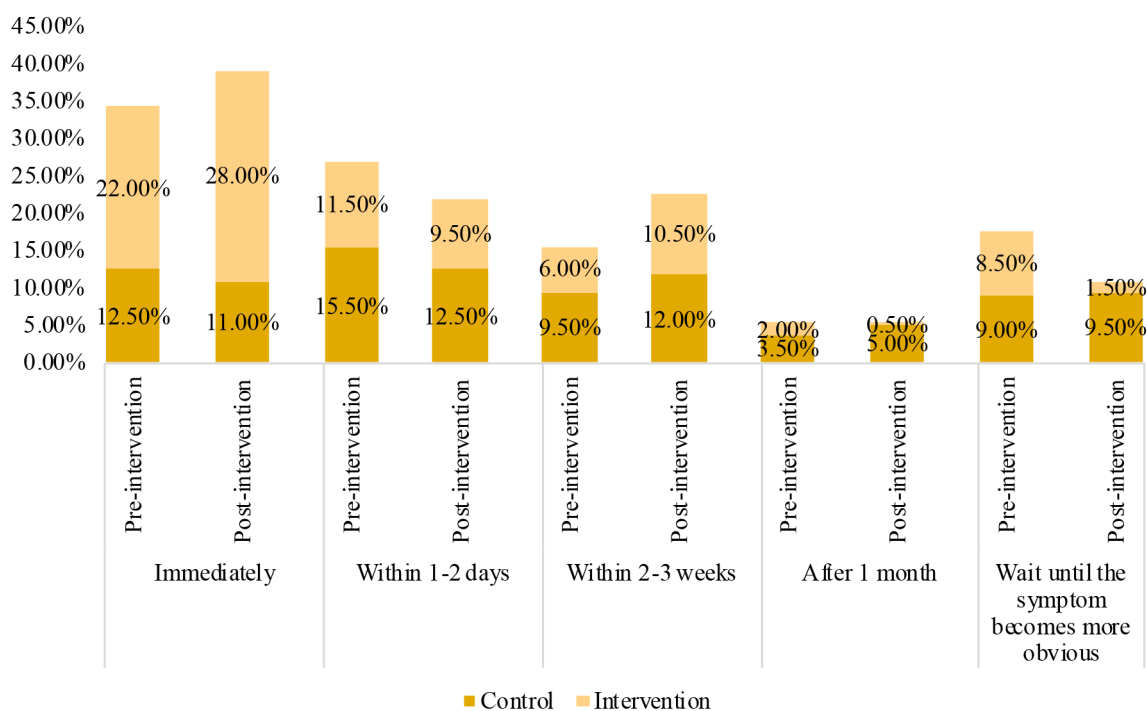


FIGURE 3. Duration for seeking help when noticed the sign of cervical cancer in both groups during pre- and post-intervention

the infection with HPV and multiple sexual partners, but very poor for all other symptoms such as having a weakened immune system, smoking, starting to have sex at a young age and other risk factors that were listed. Figure 4 shows recall for each risk factors among the control and intervention group. Overall, the recall result was deficient.

Recognition of risk factors of cervical cancer was listed based on their opinion. Table 3 has summarized the result of recognition risk factors in both groups. For the control group, most of the participants were have insufficient knowledge and awareness of cervical cancer risk factors such as infection with HPV, smoking, long term use of the contraceptive pill, infection with Chlamydia, sex at a young age (before age 17), many sexual partners, sexual partner with many previous partners, and not going for regular Pap Smear tests, with p -value > 0.05 after pre and post-intervention session. Some of them have good knowledge in terms of a weakened immune system, a sexual partner who is not circumcised and many children. Apart from that, in the intervention group, there is a significant difference in terms of knowledge risk factors among participants before and after the intervention, where the p -value is < 0.05 such as infection with HPV, smoking, long term use of the contraceptive pill, infection with Chlamydia,

having a sexual partner who is not circumcised, sex at a young age (before age 17), many sexual partners, many children, sexual partner with many previous partners, and not going for regular Pap Smear Tests. In the control groups, only two risk factors have significant different between pre- and post. However, in the intervention group, all risk factors have significant different between pre- and post-intervention. Furthermore, Figure 5 and 6 are the summarization in terms of percentage of risk factors for both groups during pre- and post-intervention based on participant opinions.

Figure 7 illustrates the attitudes towards cervical cancer in detecting the symptoms. Participants in control group show very similar attitudes even though after the intervention, and there is no significant difference before and after intervention with Z value is -0.0974 , the p -value is 0.92034 , and W value is 704.5 . For the intervention group, an increase in the percentage of participants who had relatively confident and very confident of detecting cervical cancer. There is a significant difference before and after the intervention with Z value is -5.2958 , p is 0.00001 and W value is 171.5 . Most participants are aware of the pap smear test, where 26.5% in the control group pre-intervention and 35.5% in the intervention group. Table 4 shown higher in the number of students who do not

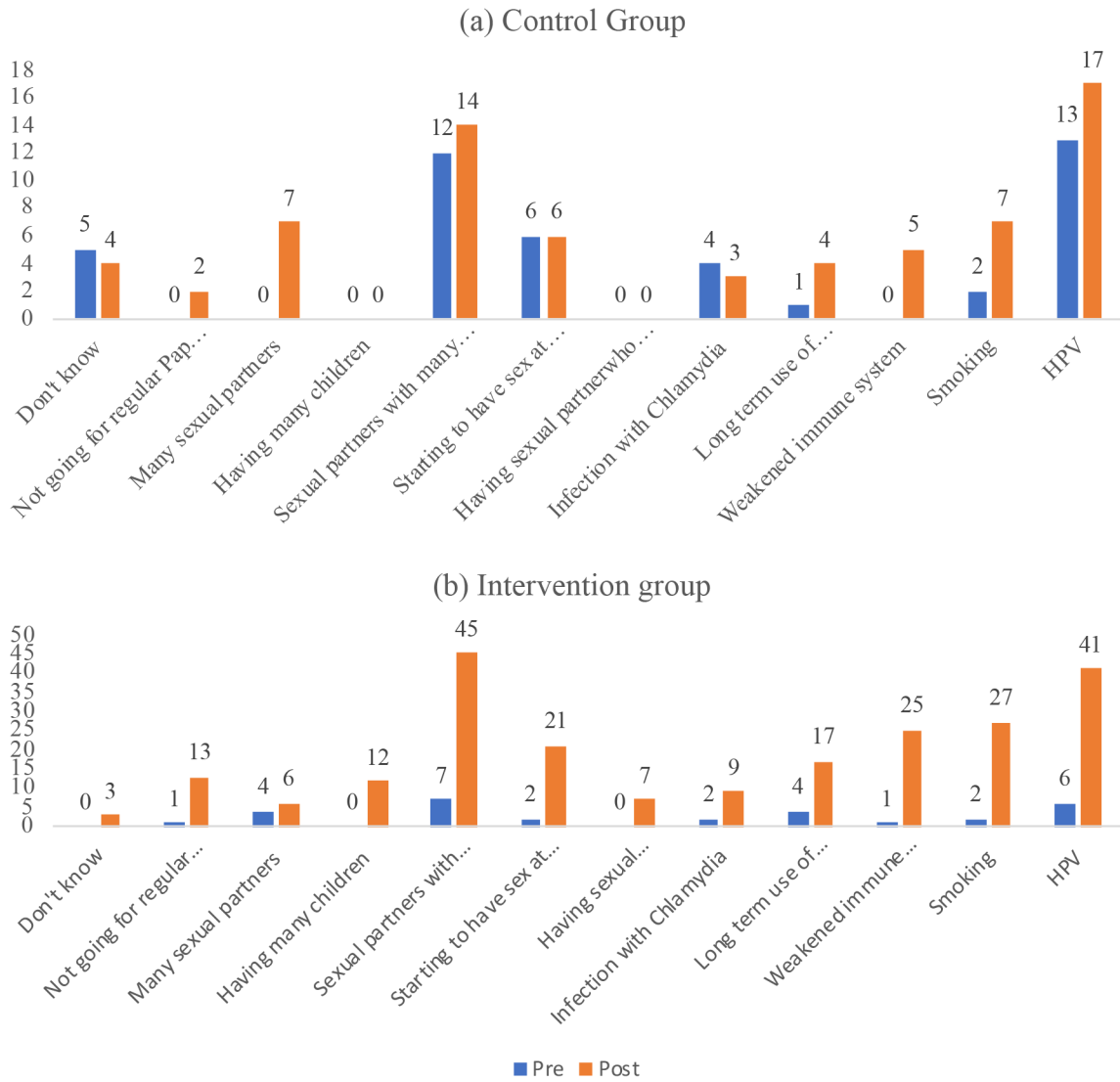


FIGURE 4. Recall of risk factors of cervical cancer in (a) control group and (b) intervention group of pre- and post-intervention

know the screening program in both groups. At post-intervention, it was 21.0% in the control group. There are no statistically significant differences between pre- and post-intervention in the control group ($\chi^2= 10.531$, $p= 0.005$). Meanwhile, in the intervention group, about 45.0% of participants are aware of the availability of these services in Malaysia. Post-intervention was significantly higher in number than pre-intervention with $\chi^2= 14.207$, $p= 0.001$. However, the recommended age to encourage pap smear screening remains low even after the post-intervention in both groups.

Table 4 shows the result of the participants aware of the vaccination program in Malaysia. Both groups show higher in number who aware

the vaccination programme during pre-intervention (control= 39.5%, intervention= 38.5%). Some of them does not know the appearance of vaccination to prevent cervical cancer which in the control group is 9.0% and intervention group is 10.5%. After post-intervention and introduction of the HPV vaccine, 48.0% of participants among intervention group are aware of the availability of vaccine in Malaysia and there are statistically significant differences among both test and group with $\chi^2= 15.647$, $p= 0.000$. There was a positive association in terms of vaccination awareness between pre- and post-intervention groups. However, the recommended age for HPV vaccination remains low even after the post-intervention in both groups.

TABLE 3. Recognition of cervical cancer risk factors in both group during pre- and post-intervention.

Risk factors	Control group	Intervention group
Infection with HPV	Z= -0.9884 W= 1105.5 p= 0.32218	Z= -2.6306 W= 793 p= 0.00854
Smoking	Z= -1.0557 W= 970 p= 0.28914	Z= -2.3454 W= 1131 p= 0.01878
Long term use of the contraceptive pill	Z= -1.8178 W= 875.5 p= 0.06876	Z= -2.2823. W= 1052 p= 0.0226
Infection with Chlamydia	Z= -1.2809 W= 1117.5 p= 0.20054	Z= -2.1601 W= 1138 p= 0.03078
Having a sexual partner who is not circumcised	Z= -2.0484 W= 920.5 p= 0.04036	Z= -3.2499 W= 915 p= 0.00116
Starting to have sex at a young age (before age 17)	Z= -1.0999 W= 1118 p= 0.27134	Z= -4.3141 W= 1003 p= 0.00001
Having many sexual partners	Z= -1.0717 W= 1256 p= 0.28462	Z= -2.2707 W= 966 p= 0.0232
Having many children	Z= -2.2643 W= 910.5 p= 0.02382	Z= -5.9242 W= 554.5 p= 0.00001
Having a sexual partner with many previous partners	Z= -0.5484 W= 1393.5 p= 0.58232	Z= -2.7319 W= 1021 p= 0.00634
Not going for regular Pap Smear Tests.	Z= -1.3661 W= 1102 p= 0.17068	Z= -3.4724 W= 923 p= 0.00052

This study focused on determining and evaluating the effectiveness of educational intervention regarding the awareness and knowledge of cervical cancer among undergraduates' students. These include the risk factors, seeking help, the warning signs and symptoms, attitudes towards cervical cancer and the availability of screening and vaccination in Malaysia. Most of the participants were the age in the range of

18-30 years old and the mean ages of sample size was 21.97 ± 1.794 , respectively. Another study was also done among female student in private university Malaysia, Lemson et al., where the peak age respondents were 18-20 years age group followed by 21-22 years, age group (Lemson et al., 2018). A study by the Kwang et al. at the local institution which provides science matriculation program evaluate the students and the majority 18-20

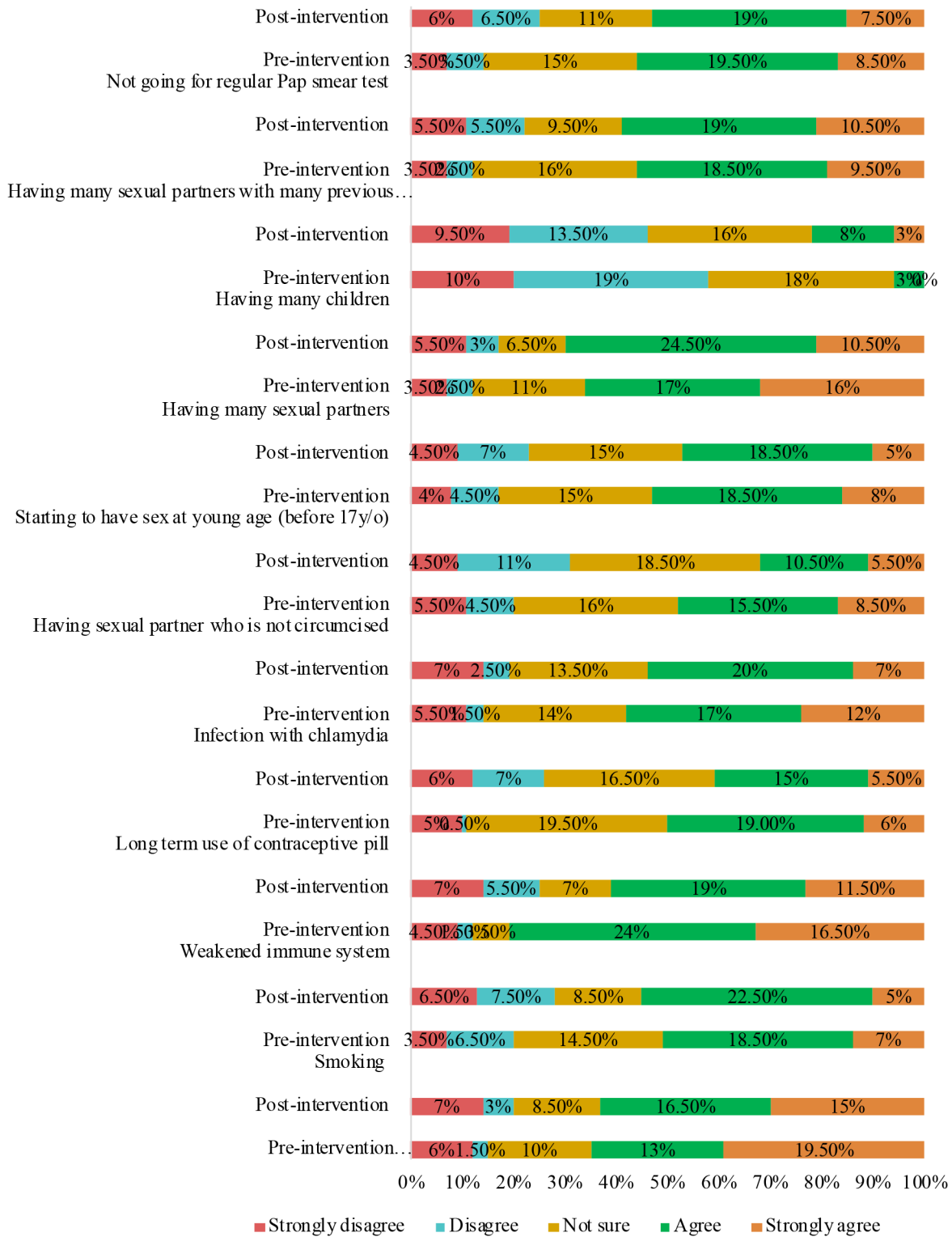


FIGURE 5: Percentage of students who had answer cervical cancer risk factors among control group during pre- and post-intervention

years age group with the same objectives (Kwang et al., 2016).

Majority of the students were all single female

(Lemson et al., 2018) and only one student is married (Kwang et al., 2016). So, this reflects that most studies

were done among student who is single and young

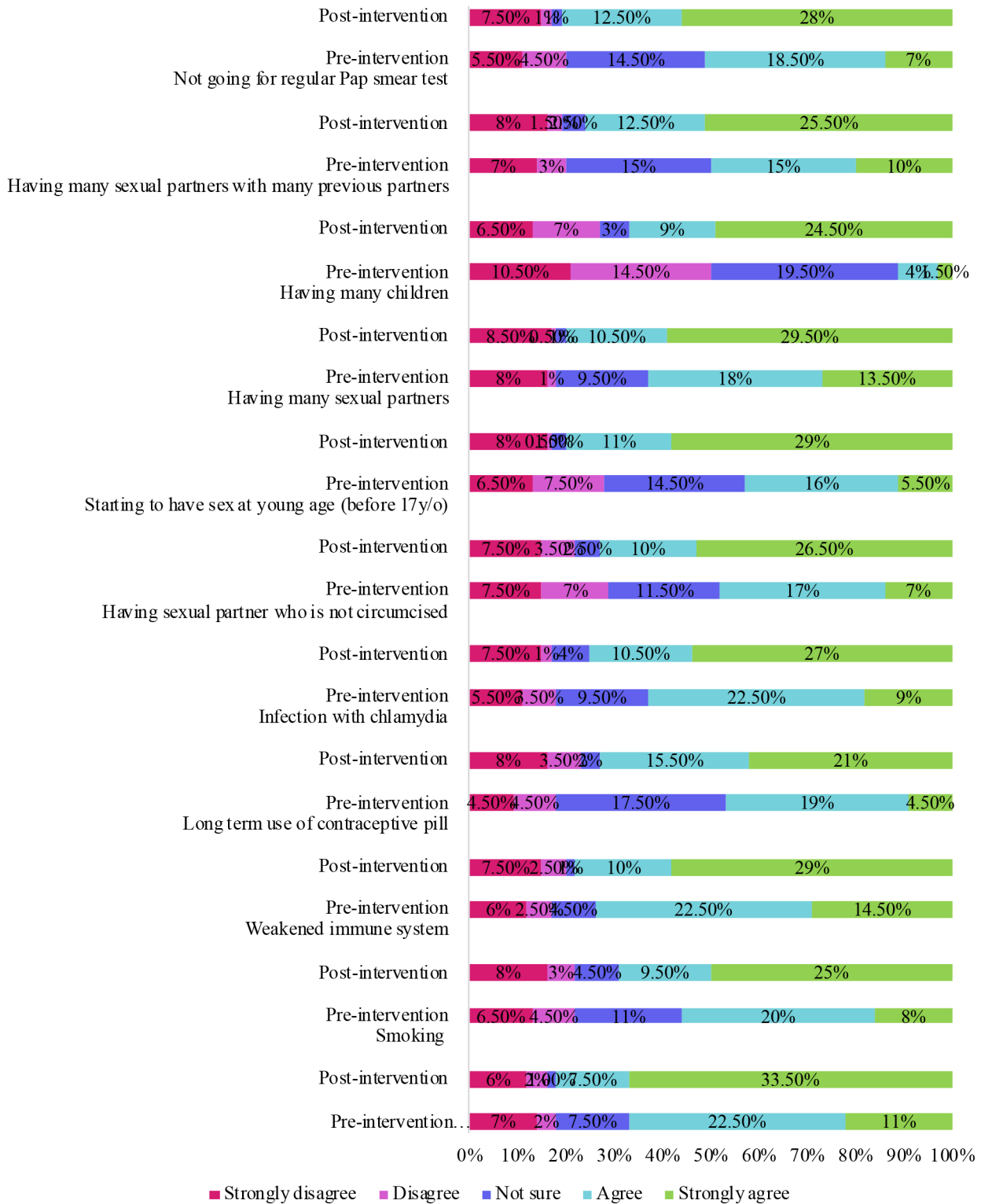


FIGURE 6. Percentage of students who had answer cervical cancer risk factors among the intervention group during pre- and post-intervention

women. The other finding among female students in MSU state that 26.0% from the participants are married and is considered higher when compared to other studies

where the higher in the number of student age from 20 years old and above (73.7%) (Al-Naggar et al., 2010). These findings have an important objective which to

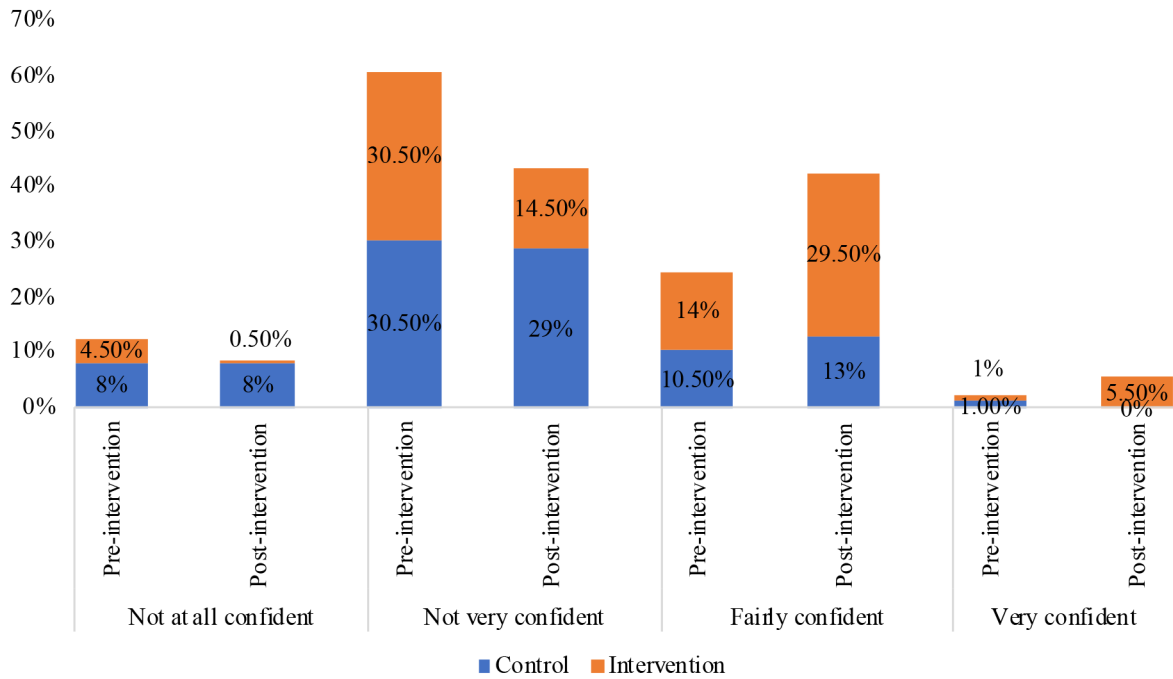


FIGURE 7. Percentage of students who had answered the confidence level to detect cervical cancer symptom in both groups during pre- and post-intervention

evaluate the young women to have an appropriate awareness and knowledge and its prevention because they are high risk to get cervical cancer (Lemson et al., 2018).

This study discussed and evaluated the knowledge and awareness of cervical cancer among participant who is undergraduates' student who has inadequate and unsatisfactory result before the intervention. Most of them are alert with specific knowledge, but overall, the results were poor. This result consistent with other study done by Wong et al., where poor awareness and knowledge was seen among the young women. Similar with this study, when the questions asked about cervical cancer, most of them referred to the general knowledge of cancer such as fast food, genetic, not aware and others primarily for recall questions which evaluate their memories in term of knowledge of cervical cancer. Some have good knowledge in certain aspects.

When reviewing the other studies, we found that no other studies were used cervical awareness measure; a validated measure of questionnaires to assess the knowledge and awareness among young women. Based on the recall result of warning signs and symptoms using an open question, the result shows relatively poor (20.0%) for all symptoms except menstrual period

that are heavier and longer before the intervention. After the intervention session, the understanding regarding awareness of cervical cancer was higher by most the participant in the intervention group. A higher level of knowledge was seen among participant during recognition questions (Waller et al., 2004). Comparable between before and after intervention in both groups was done based on the knowledge of warning signs, but there is no statistically significant difference seen in the control group. Besides, the participants in the intervention group had equally poor knowledge of warning signs before the intervention. However, after the intervention, there is a significant difference between the knowledge before and after as the intervention would improve their knowledge except for the menstrual period that is heavier and longer. This exception related to recall menstrual period that is heavier and longer.

Other than that, participants in the control group will contact their doctor when noticed the sign of cervical cancer slightly similar even before and after the intervention and some of them will wait until the symptoms become more apparent. This result would increase cervical cancer incidence. Early cancer detection in developed countries has reduced the incidence as compared to developing countries (Jemal

TABLE 4. Availability of health services for cervical cancer in Malaysia

Awareness about health services	Pre-intervention, n (%)	Post-intervention, n (%)	Chi-square, P-values
<u>Control group</u>			
Pap smear test			
Yes	53(26.5)	42(21.0)	$\chi^2= 10.531, p= 0.005$
No	8(4.0)	25(12.5)	
Don't know	39(19.5)	33(16.5)	
Vaccination			
Yes	79(39.5)	54(27.0)	$\chi^2= 23.926, p= 0.000$
No	3(1.5)	27(13.5)	
Don't know	18(9.0)	19(9.5)	
Recommended age	Low	Low	
<u>Intervention group</u>			
Pap smear test			
Yes	71(35.5)	90(45.0)	$\chi^2= 14.207, p= 0.001$
No	2(1.0)	25(12.5)	
Don't know	27(13.5)	7(3.5)	
Vaccination			
Yes	77(38.5)	96(48.0)	$\chi^2= 15.647, p= 0.000$
No	2(1.0)	0(0.0)	
Don't know	21(10.5)	4(2.0)	
Recommended age	Low	Low	

**Low level=less than 50%

et al., 2011). According to the Zaridah, majority of the cases were diagnosed at stage 2 and above and only 21% were diagnosed at stage 1 (Zaridah, 2014). This will contribute to the issues and challenges in the treatment option, recovery and survival rate (Narimah et al., 2014). Participants in the intervention group anticipated a minimal delay in seeking medical help when they have noticed the signs of cervical cancer during post-intervention. Most of them will contact the doctor immediately or within two weeks.

This study also made a comparison between both groups in term of the awareness and knowledge of risk factors in cervical cancer during pre- and post-intervention session. The questions attempt is with open

questions (recall) and closed questions (recognition) of risk factors. Recall answer to knowledge was very poor in both groups. Most of the students answer in general knowledge such as hygiene, family history, lifestyle and unhealthy food intake. Only some of them had answered correct and specific risk factors of cervical cancer. In the intervention group, participants show an excellent improvement in knowledge and they could recall the risk factors very well during post-intervention session. Eleven of risk factors was listed in recognition segment based on their opinions and there is no statistically significant difference was seen in control group except having weakened immune system, a sexual partner who is not circumcised and many children. However, in the

intervention group, there is a significant difference after the intervention session, where most of them have a reasonable opinion regarding risk factors. This is because most of them are aware and well known the risk factors after exposed the knowledge. The overall poor understanding was seen among the participant especially when answering the open questions (recall) because the participants must write the answers and have no answers to choose.

The attitude of participants in control group towards cervical cancer was unsatisfactory during pre- and post-intervention because most of them are not at all confident and not very confident and very least confident in detecting cervical cancer. This might be due to insufficient knowledge and practices of the signs and symptoms. These attitudes will impact seeking medical help and would delay contacting their doctor. Certain people have a wrong impression to be examined by the doctors due to the fact of religious and cultural belief which exposing their body, especially when the doctors is male. In this regard, by promoting the awareness on cervical cancer in terms of knowledge, attitudes and behavioural, the confidence levels of people to detect the cervical cancer were increase among intervention group and some of them are very confident in detecting it after they knew the signs and symptoms.

Awareness of Pap smear test among the control and intervention group was abysmal result during pre-intervention. After the intervention, awareness of the pap smear test drastically increased, where 45.0% of participants know the availability of the screening program in Malaysia. A similar finding was done among female university students were only 6.0% of the participant who has had a pap smear test, which reflecting deficient and unsatisfactory result. A similar finding was reported among Malaysian women which revealed some of the participants did not know the Pap smear test, one of them had never even heard of this term, and some could not explain what a Pap smear test was. The understanding was low among those who did not know the pap smear test (Wong et al., 2009). The reason of this problem includes lack of knowledge about the availability of screening (Al-Naggar et al., 2010) and uneven distribution to assess medical facility in the country (Cheah and Looi, 1999).

In this study, low awareness of vaccination was seen among the participant in both groups. Some of them are still lacking and do not know the presence of the vaccination programme in Malaysia either free or need to pay in both groups. Based on their perception, single, healthier and not getting married are the reasons they do not become aware of the vaccines. Level of awareness has increased after post-educational intervention in the

intervention group. Both groups have shown significant differences during pre- and post-intervention.

CONCLUSION

This study emphasizes the crucial of educational intervention in increasing the knowledge and awareness for cervical cancer. In general, most of the participants had poor knowledge and awareness regarding cervical cancer during pre-intervention in both groups. After the intervention session, the overall result of the intervention improved their level of knowledge. However, the recommended age for vaccination and Pap smear screening has remained low even after the intervention. Hence, it is suggested for the university students to increase the knowledge regarding the appropriate age for vaccination and screening for cervical cancer.

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