ASIAN JOURNAL OF PHARMACEUTICAL AND CLINICAL RESEARCH

INNOVARE ACADEMIC SCIENCES
Knowledge to Innovation

Vol 11, Special issue 3, 2018

Online - 2455-3891
Print - 0974-2441

Research Article

ASSESSMENT ON KNOWLEDGE REGARDING HUMAN PAPILLOMAVIRUS VACCINATION AMONG MAHSA UNIVERSITY STUDENTS

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Received: 2 March 2018, Revised and Accepted: 16 March 2018

ABSTRACT

Objective: This study aimed to assess the knowledge of undergraduate students of MAHSA University on human papillomavirus (HPV) vaccination.

Methods: The cross-sectional study was conducted using a self-administered questionnaire among 350 local undergraduate students recruited by convenience sampling. The survey was conducted in English and consisted of questions on demographic data and 14 questions on knowledge toward HPV vaccination. Verbal consent was obtained from the participants beforehand, and their participation was voluntary and anonymous.

Results: The participants have scored below average (6.09±3.39) for knowledge on HPV vaccines with a significant difference in terms of age, gender, and program of the study. Students from medicine, dentistry, and biomedical science tend to have better mean knowledge score (7.39±2.99) with 25% scored 10 and above. The non-health-care students showed insignificant lower mean knowledge score of 4.17±2.06, respectively.

Conclusion: This study has demonstrated moderate level HPV vaccine knowledge toward HPV vaccination among university students with majority posed background of health-related knowledge.

Keywords: Human papillomavirus, Cervical cancer, University students, Vaccine.

 DOI: http://dx.doi.org/10.22159/ajpcr.2018.v11s3.30032

INTRODUCTION

Human papillomavirus (HPV) is the most common viral infection of the reproductive system, and it is one of the most common sexually transmitted diseases [1,2]. Approximately 99% of the cervical cancer cases are contributed by HPV infection [3]. Common high-risk HPV strains, which are HPV 16 and 18, contribute 70% of cervical cancers and also cancers of anus, vagina, vulva, penis, and head and neck cancers [4]. There is less probability from low-risk HPV strains to cause cancer; however, HPV strains 6 and 11 can contribute 90% occurrence of genital warts [5].

Administration of prophylactic vaccine and elimination of sexual risk factor are the primary prevention of HPV infection [6]. The Food and Drug Administration has approved three vaccines for preventing HPV infections, which are Gardasil® (quadrivalent HPV vaccine), Gardasil®-9 (nanovalent HPV vaccine), and Cervarix® (bivalent HPV vaccine) and administered through 3 injections intramuscularly. According to the National Cancer Institute high-risk HPV strains, HPV 16 and 18 can be prevented with these three HPV vaccines. The Advisory Committee on Immunization Practices (ACIP) recommended the routine use of Gardasil® in females aged 11 or 12 years old [7,8].

Shafiee, in his study, pointed out that 30–60% of all sexually active adults will acquire HPV infection at some point in their lives and highest incidence occurred among adult aged between 18 and 28 years old [10]. Administration of HPV vaccine after first sexual intercourse reported lessen efficacy of HPV vaccine [11]. Persistent infection with high-risk HPV genotypes leads to cancers though most of the HPV infections are self-limiting. Another study showed that younger age women, use of contraceptives, alcohol drinking, and smoking have a higher risk of HPV infection [12].

In Malaysia, the Ministry of Health (MOH) has implemented the National HPV vaccination program since 2010, which targeted for Form 1 female students and free for three complete doses [13]. However, there are limited studies about HPV vaccine knowledge and its attitude among university students which include male and female in Malaysia. The studies carried out in Malaysia previously include a population of non-healthcare university students, mother, secondary school girls, and female adults [10,14-16]. This study aims to determine the knowledge of HPV vaccination among MAHSA University students.

METHODS

The questionnaires were adapted from two studies conducted previously on two different populations [10,17]. Questions on demographic profile were outlined based on literature review of numerous similar studies. The HPV vaccination knowledge statements were consisted of 15 questions with the options of true, false, and unsure. In knowledge section, one point was given to a correct answer by respondents. The knowledge score for the respondents was categorized into poor, moderate, and good knowledge. The questionnaire was pilot tested and resulted in Cronbach's alpha of 0.619.

The questionnaires were made available to all MAHSA university students studying bachelor degree regardless of age. Only Malaysian nationalities were included. Bachelor degree students who were not available in the campus and in semester break were excluded from the study.

The completed questionnaires were analyzed using the SPSS Statistical software version 22. Descriptive statistics were used to analyze the frequency, percentage, and mean of the data. Independent t-test and ANOVA were used in comparison of knowledge scores for demographic variables.

RESULTS

Sociodemographic characteristics

From the data collected from university registry office, 1757 Malaysian students were registered for bachelor's studies regardless of year and courses during the time of this study. A number of 350 questionnaires

were distributed randomly in classes, libraries, and university cafes to meet the minimum sample size. The demographic profile is tabulated in Table 1. Two-thirds of the respondents were female and aged 18–23 years old. Almost all respondents were from health-care-related courses (90%).

Knowledge on HPV vaccine brand name

A huge amount of 84.6% (n=296) responded positive when asked on the availability of HPV vaccines in Malaysia regardless of courses or gender. They were unsure on the brand name, but they knew the MOH campaign on HPV vaccination program which started in 2010. The number of respondents recognized Cervarix® as HPV vaccine was higher than Gardasil®, with 20.3% and 4.7%, respectively. Only 2.4% replied that both brands are available in Malaysia which is true.

Despite major campaign by the ministry to provide free school-based vaccination to Form 1 secondary school students (irrespective of age), 34.5% of participants believe that the vaccine is only to be taken at 18 years old and above and 26.4% of respondents were uncertain on the recommended age (Table 2). A smaller number of respondents knew that HPV vaccination is available to both genders (19.3%) since the free vaccination was only delivered for Malaysian women aged 18–26. More than half (58.5%) recognizes the need to take three injections of the vaccine over 6 months' duration.

Knowledge on HPV vaccine uses

An analysis of correct responses to the survey questionnaires was performed (Table 2). A vast majority knew that HPV vaccines protect against cervical cancer, but only 38.5% noticed that HPV vaccination only protects against certain strains of virus that causes cervical cancer. Moreover, similar numbers of participants were unsure on numerous strains of HPV. About 21.3% of respondents thought that HPV vaccination acts as preventive measures against all sexually transmitted infections (STI), whereas 46.3% that aware of the HPV vaccination is only for the most common STI.

Nearly half (44.6%) knew that this vaccine will protect them from genital warts, but 17.9% falsely believed the vaccine as genital warts treatment. Only 27% and 23% knew that HPV vaccination will not treat genital warts and genital herpes, respectively. Only few respondents (47%) noticed that HPV vaccination is best taken before first sexual activities and aware that the effects of vaccination pre- and post- sexual activities were unsimilar. The participants (53.4%) knew that the HPV vaccination is important to women with one sexual partner as well as for women with multiple partners.

A higher percentage (42.9%) of respondents were uncertain that women previously vaccinated further pap smear and 48.3% realized that pap smear test acts as extra protective measures in addition to HPV vaccination since it acts as early detection or screening procedure of cervical cancer.

Knowledge scores were reported in mean with a range between 0 and 15 (Table 3). Interestingly, despite the high percentage of positive response toward HPV vaccination, only 16.6% of 296 participants showed a good knowledge score with one-third poor score. The mean score was moderate with 6.09±3.39 (mean±standard deviation [SD]).

Three sociodemographic variables (age, gender, and courses) were analyzed in determining their association that could influence their knowledge score on HPV vaccination (Table 4). There was a good knowledge score with an increase in age. A significant difference was found in knowledge scores between genders despite both genders displayed the moderate score of 5.81±3.70 and 6.82±3.58 for male and

Table 1: Demographic profile of respondents (n=350)

Demographic variable	n (%)
Gender	
Male	110 (31.4)
Female	240 (68.6))
Age	
18–20	59 (16.9)
21–23	220 (62.9)
24–26	65 (18.6)
>27	6 (1.7)
Ethnicity	
Malay	100 (28.6)
Chinese	171 (48.9)
Indian	54 (15.4)
Other	25 (7.1)
Program of the study	
Medicine	60 (17.1)
Dentistry	61 (17.4)
Pharmacy	60 (17.1)
Biomedical science	58 (16.6)
Physiotherapy	55 (15.7)
Medical imaging	21 (6.0)
Environmental health	4 (1.1)
Engineering	9 (2.6)
Business	22 (6.3)

Table 2: Knowledge of the respondents toward HPV vaccination (n=296)

Statements	Answer	n (%)		
		Answer correctly	Answer incorrectly	Unsure
HPV vaccine protects against cervical cancer.	True	226 (76.4)	2 (0.7)	68 (23.0)
HPV vaccine protects against all types of the virus that causes cervical cancer.	False	114 (38.5)	68 (23.0)	114 (38.5)
HPV vaccine protects against all sexually transmitted infections.	False	137 (46.3)	63 (21.3)	96 (32.4)
HPV vaccine can only be taken after the age of 18 years old.	False	116 (39.2)	102 (34.5)	78 (26.4)
HPV vaccine is currently available to both men and women.	True	57 (19.3)	127 (42.9)	112 (37.9)
HPV vaccination is taken as three injections over 6 months.	True	173 (58.5)	19 (6.4)	104 (35.1)
HPV vaccine can treat genital warts.	False	80 (27.0)	51 (17.2)	165 (55.7)
HPV vaccine offers protection against genital warts.	True	132 (44.6)	27 (9.1)	137 (46.3)
HPV vaccine does not protect against genital herpes.	True	68 (23.0)	66 (22.3)	162 (54.7)
Women who receive HPV vaccine need less frequent pelvic examination.	False	120 (40.5)	34 (11.5)	142 (48.0)
Women who receive HPV vaccine do not have to get Pap smear.	False	143 (48.3)	26 (8.8)	127 (42.9)
HPV vaccine is best taken before starting to have sexual activities.	True	139 (47.0)	59 (19.9)	98 (33.1)
HPV vaccines have the same effect whether the female takes it before or after being infected with HPV.	False	141 (47.6)	22 (7.4)	133 (44.9)
HPV vaccine is only important for women with more than one sexual partner.	False	158 (53.4)	53 (17.9)	85 (28.7)

HPV: Human papillomavirus

Table 3: Knowledge mean score among participants

Knowledge mean score	Poor 0-4	Moderate 5-9	Good 10-15
Frequency (%)	96 (32.4)	151 (51.0)	49 (16.6)

One point was given to correct answer for each question. The knowledge score was categorized into poor, moderate, and good knowledge

Table 4: Correlations between knowledge mean score and sociodemographic variables

Demographic variables	Knowledge score Mean±SD*	p
Age		
18–20	5.86±2.69	0.027
21–23	5.80±3.37	
24–26	7.02±3.70	
>27	8.00±2.90	
Gender		
Male	5.81±3.70	0.016
Female	6.82±3.58	
Program of the study		
Medicine	7.47±3.25	<0.001
Dentistry	7.57±2.85	
Pharmacy	5.79±3.10	
Biomedical science	7.16±2.83	
Physiotherapy	2.21±2.37	
Medical imaging	6.27±2.67	
Environmental health	3.00±0.71	
Engineering	6.00±2.07	
Business	3.50±1.55	

*SD: Standard deviation

female respondents, respectively. Results shown in Table 4 were similar between three health-care courses (medicine, dentistry, and biomedical science) with an average knowledge score of 7.39±2.99 (n=168) and medical imaging students (6.27±2.67; n=15) showed slightly higher knowledge score compared to pharmacy students (5.79±3.10; n=48). Participants from non-health-care courses showed poor-to-moderate knowledge score of 4.17±2.03 (n=23).

DISCUSSION

This study assessed on knowledge of MAHSA university students on HPV vaccination by random selection. In this study, the respondents were mainly made up from the age of 21 to 23 years old (62.9%). The young adult is the main concern in this study as more than half of the sexual-transmitted disease-infected population are from the age range of 15 to 24 years old [18]. The awareness level of 84.6% was observed in this study which was similar to that reported by Blodt and his research group Blödt *et al*. [19]. The percentages reported by the previous studies conducted in Malaysia were as low as 7.8% and up to 76.3% [3,10,15,20].

There was moderate knowledge mean score seen in this study which was similarly noted among pre-university students [1]. Most of the students (76.4%) knew the purpose of HPV vaccination which is similar to the other two studies conducted in Malaysia with 67.9% and 73.2%, respectively [1,10]. A low number of 23% of students were seen to be unaware of the function of HPV vaccination despite the HPV school-based vaccination program was launched in 2010.

Although 44.6% knew that the vaccine also protects against genital warts and it was higher compared to study done among Belgian students (19.4%) [21] and Sadry research group [22], the percentage was expected to be higher since most of the respondents (92%) were from health-care-related courses. HPV vaccination is well known for protection against cervical cancer compared to genital warts and genital herpes though both are caused by certain strains of HPV [22].

Higher awareness of cervical cancer protection by HPV vaccine is due to common non-technical term for HPV vaccines which is "the cervical cancer vaccine" which targeted to young women at the aged 26 and below rather than for men [15]. With regard to vaccination among men, 42.9% of students' misunderstood that the uses of HPV vaccine are only for women, and it has been demonstrated that Gardasil® was shown to prevent cancer and HPV-related diseases in men [23].

Condoms may lower the chances of suffering HPV for sexually active adults, but it does not eliminate the risk which not gives a full protection [24].

In this study, almost half of the participants answered correctly that the course of HPV vaccination is three injections over 6 months and approximate number unsures with this statement. Similar pattern observed among female students in Lebanon and lower percentage (36.2%) in Penang [3,17]. ACIP initiated two doses of HPV vaccination for girls and boys between ages 9 and 14 years and recommended three doses for 15–26 years old, whereas complete regimen of 3 doses within 6 months duration in Malaysia [1,9].

Nearly half of the respondents demonstrated good understanding that full benefits of the vaccination are available only for those who taken it before their first sexual encounter. Since HPV infection is transmitted directly, the onset of infection may start immediately after sexual intercourse [5]. However, a positive result was shown in studies conducted among college students in Lebanon and Belgium with higher percentages of 66% and 83%, respectively [17,21].

The participants (53.4%) knew that the HPV vaccination is important to women with one sexual partner as well as for women with multiple partners. The reported positive percentage of respondents' knowledge was lower compared to result in a study done in Toronto that most of respondents (87.8%) aware that the number of sexual partners is not a determinant factor for HPV vaccination [22]. Adequate information regarding the benefits of it despite sexual inactive should be addressed as it could be one of the main barriers for unintended of vaccination [2]. Moreover, having less number of sexual partner helps in reducing the risk of HPV infection [15].

Furthermore, approximately half of the respondents knew the need of Pap smear screening even after HPV vaccination. However, similar numbers of respondents (42.9%) hesitate that pap smear could provide extra benefit post vaccination. In a study by Wong and Sam among female university students, more than half (57.2%) heard of pap smear test, but only minority of them could identify the use of pap smear [20]. Thus, misinformation has led to a lower rate of cervical cancer screening among vaccinated female population compared to unvaccinated group [25,26]. It is critical as HPV vaccination together with regular Pap smear test effective in preventing mortality and morbidity brought by HPV infections [21].

Knowledge scores among health related students were found slightly higher though moderate compared to non-health-related programmes. Similar results were found in college female students in Lebanon [17]. Among all the programmes involved in this study, students from physiotherapy studies showed the lowest mean knowledge score [2.21±2.37]. This may be due to syllabus learnt which focus on human anatomy, rather than physiology. In a study run in obstetrics clinic, the knowledge of HPV vaccines and HPV immunization program was significantly associated with the level of education and ages [14].

CONCLUSION

This study has demonstrated moderate level HPV vaccine knowledge toward HPV vaccination among university students with majority pose background of health-related knowledge. Besides, the survey was a cross-sectional study instead of longitudinal, and hence, unable to provide information on changes of findings over time. Knowledge is likelihood to associate with attitude toward HPV vaccination, and thus, it is important to stress on the dissemination of information related to HPV vaccination among young adults.

FUNDING SOURCES

This research did not receive any specific grant from funding agencies in the public, commercial, or non-profit sectors.

CONFLICTS OF INTEREST

There are no conflicts of interest to declare.

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