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Awareness of Human Papillomavirus (HPV) among School Children in Johor, Malaysia

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Authors' contributions

This work was carried out in collaboration between all authors. Authors SG, FI and GI designed the study. Authors SG and FI performed the statistical analysis and wrote the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Aims: The aim of this study was to assess the understanding of human papillomavirus (HPV) infection, knowledge of HPV vaccination as well as acceptance of the HPV vaccination among female secondary school students in Kota Tinggi, Johor, Malaysia.
Study Design: A cross-sectional study was performed using a self-administered validated questionnaire. Respondents were selected using convenience sampling. The questionnaire was divided into four sections; demographics, knowledge of HPV, knowledge of HPV vaccination and acceptance of HPV vaccination.
Place and Duration of Study: The study was conducted in five selected secondary schools in Kota Tinggi, Johor, Malaysia between January 2017 and July 2017.
Methodology: We included 314 female respondents, aged 13 years old.
Respondents who were willing to complete the questionnaire were included with adult informed consent. Incomplete questionnaires were excluded from the study. A total score of 20 was calculated for overall knowledge of HPV (14 items on knowledge of HPV and 6 items on HPV vaccination). Overall knowledge was categorized as low (score 0-6), intermediate (score 7-13) and high (score 14-20).

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Results: The overall knowledge level of HPV was low (mean score: 6.61 ± 4.67). Over two-thirds of respondents (n= 217, 69%) however, indicated their intention to get a HPV vaccination compared to those that were not willing to be vaccinated or unsure (n=97, 31%). Willingness of respondents to be vaccinated was significantly associated with the overall knowledge of HPV (P = 0.03). The main reason for vaccination non-acceptance were safety, side effects and efficacy concerns.

Conclusion: The intention to get vaccinated was significantly associated with overall knowledge of HPV. The need for education on HPV and its prevention among female secondary school students is therefore required.

Keywords: Human papillomavirus; knowledge; cervical cancer; vaccination.

1. INTRODUCTION

Cervical cancer causes approximately 270 000 deaths worldwide, with more than 85% of these deaths occurring in low- and middle-income countries [1]. In high-income countries, the incidence of cervical cancer mortality has fallen during the past 30 years, largely due to effectiveness in screening and treatment programs [2-3]. However, there remains a challenge in further reducing cervical cancer incidence due to limited access to health services, lack of awareness and absence of vaccination programs in certain countries [1,3].

In Malaysia, cervical cancer is the second most common female cancer contributing to approximately 14.8 cases per 100,000 women [4]. The Ministry of Health Malaysia reports an average of 2000 to 3000 hospital admissions of cervical cancer cases per year, with most of them presenting as stages III and IV of the disease [5]. Patients in Malaysia have also shown poorer outcomes. Malaysian cervical cancer mortality rates are more than two times higher than the Netherlands, United Kingdom and Finland [6]. Cervical cancer can cause debilitating consequences to the economy if not managed appropriately. Therefore, various programs have been introduced to reduce the incidence of cervical cancer in Malaysia.

In 2010, the Malaysian government established a national human papillomavirus (HPV) vaccination program to reduce the national cervical cancer burden [7]. The HPV vaccine is given free-of-charge to female secondary school students, with the target age group of 13 years old. Despite this program, the uptake of the vaccine has been low due to poor acceptance among parents [8-10]. In general, reasons for the poor HPV vaccination program acceptance have been the lack of knowledge and poor attitude towards vaccination [10-11].

A number of local studies have been conducted since the introduction of the vaccination program to assess its effectiveness [8-11]. However, most of these studies are conducted in hospitals, universities and urban areas [8-11]. There has been a lack of work conducted to explore the awareness of cervical cancer and HPV vaccination among female secondary school students in the non-urban local population. A better understanding of the knowledge, barriers and acceptance towards HPV vaccination among the targeted population may help improve the current vaccination program. Therefore, this work aims to assess knowledge of HPV as well as acceptance of HPV vaccination among secondary school students in Malaysia.

2. METHODOLOGY

2.1 Study Design

This was a prospective cross-sectional study conducted among secondary school students aged 13 years old, in Malaysia from January to March 2017. The study was conducted in five secondary schools in Kota Tinggi, Johor. This district was chosen in view of the population's varied economic status and participation in the national HPV vaccination program. A convenience sampling method was employed to select five secondary schools within the district, which consisted of rural, sub-urban and urban populations. A total of 80 students were recruited randomly from each school with oral informed consent from school officials. Respondents who returned incomplete questionnaires were excluded.

2.2 Questionnaire

A questionnaire was distributed among the respondents. The questionnaire consisted of four sections; demographics, knowledge of HPV, knowledge of HPV vaccination and acceptance

towards HPV vaccination [12]. The Cronbach alpha value for the questionnaire was good at 0.83. The demographic data collected were ethnicity, parents' education level, family member diagnosed with cervical cancer and whether a family member has previously received a HPV vaccination.

HPV knowledge was assessed based on 14 items, whilst HPV vaccination knowledge was assessed based on 6 items [12]. Responses towards the items were on a three-point scale: yes, no or I don't know. As with all factual statements, respondents were considered to have knowledge of the statement if the item was answered correctly [9,10,12]. Similarly, respondents were considered not to have appropriate knowledge if the item was answered incorrectly or if they admitted they did not know the answer [9,10,12]. Thus, correct responses were then given '1' mark whilst incorrect or 'don't know' responses were given '0' marks [12]. The total maximum score for HPV knowledge was 14, which was then categorized as low (score 0-4), intermediate (score 5-9) and high (score 10-14) [12]. The total maximum score for knowledge of HPV vaccination was 6, which was then categorized as low (score 0-1), intermediate (score 2-3) and high (score 4-6) [12]. An overall knowledge score was also calculated with a maximum score of 20. The overall knowledge score was then categorized into low (score 0-6), intermediate (score 7-13) and high (score 14-20) [12].

Acceptance of vaccination was also assessed based on a statement 'are you in favour of HPV vaccinations' [13]. Reasons for acceptance and refusal of vaccination were also assessed [13]. Respondents were allowed to choose more than one reason for this section.

2.3 Ethical Considerations

Ethical approval was obtained from the National Medical Research Register (NMRR) and Medical Research and Ethic Committee (MREC) (ID: NMRR-16-2710-33553).

2.4 Statistical Analyses

Data was analysed using SPSS version 23.0 for windows (IBM, Armonk, NY). Descriptive statistics, such as mean scores, standard deviation and frequencies were used to analyse continuous and categorical data, such as respondent demographic factors, their knowledge level, acceptance rate and sources of information. Chi-square and ANOVA were conducted to identify possible associations or differences in mean when analysing knowledge scores of HPV, HPV vaccine and acceptance with demographic data. Statistical significance was set at $P < 0.05$.

3. RESULTS AND DISCUSSION

3.1 Demographics

Complete questionnaires were obtained from 314 respondents from a total of 400 questionnaires distributed (78.5% response rate). Most of the subjects were Malay (n=282, 89 %), followed by Chinese (n = 16, 5%), Indians (n = 12, 4%). The three main religions were Muslims (n = 287, 91%), Buddhist (n = 13, 4%) and Hindu (n = 10, 3%). Their parents were found to have at least a secondary school education with a smaller number obtaining a tertiary education (father n = 72, mother n = 67) (Table 1).

Table 1. Demographics characteristics of the study population (n=314)

Characteristics	N	%
Race		
Malay	284	90
Chinese	16	5
Indian	12	4
Others	2	1
Religion		
Islam	287	91
Buddhist	13	4
Hindu	10	3
Other	4	2
Father's education level		
Primary/ Secondary	242	77
Diploma	38	12
Degree and above	34	11
Mother's education level		
Primary/ Secondary	247	79
Diploma	33	10
Degree and above	34	11
A family member has cervical cancer		
Yes	9	3
No	289	92
Not sure	16	5
A family member has been vaccinated against HPV		
Yes	109	35
No	83	26
Not sure	122	39

3.2 Knowledge of HPV and HPV Vaccination

The mean HPV knowledge score was low (mean ± SD: 3.50 ± 1.96; total score = 14). Items with the lowest correct response was found to be 'Cervical cancer can affect men' (n = 36, 11%), followed by 'HPV is transmitted via close skin-to-skin contact' (n = 39, 12%). Items with the highest correct response were 'People can get HPV infection for a long time without knowing it' (n = 132, 42%) (Table 2). There was no significant association between HPV knowledge score and demographics of the respondents.

Respondents were found to have an intermediate mean score for knowledge of HPV vaccination (mean ± SD: 3.11 ± 1.96; total score = 6). From the six items, the lowest number of correct responses was for the item 'Do you know about the HPV vaccine?' (n=117, 37%). The highest correct response was observed in item 'HPV vaccination is currently offered freely to secondary school girls' (n = 247, 79%) (Table 2). It was demonstrated that respondents with fathers who held a diploma, had a higher score (mean ± SD: 3.92 ± 1.74) compared to those with a secondary school education (mean ± SD: 2.90 ± 2.0) or a degree (mean ± SD: 3.35 ± 1.70; P = 0.03).

When both knowledge of HPV and HPV vaccination was assessed, the overall knowledge score was found to be low among the respondents of the study population (mean ± SD: 6.61 ± 4.67; total score = 20). However, respondents with a family member that had previously received HPV vaccine were seen to have a significantly higher overall HPV knowledge score (mean ± SD: 7.62 ± 5.02), compared to those that had not received a HPV vaccine (mean ± SD: 6.46 ± 4.93) or were unsure (mean ± SD: 5.82 ± 4.00; P = 0.01).

Table 2. Knowledge of HPV and HPV vaccination among the study population (n=314)

No	Items	Response, n (%)		
	Knowledge of HPV	**Correct**	**Incorrect**	**I don't know**
1	Do you know about Human Papillomavirus (HPV)?	25 (79)	75 (235)	0 (0)
2	HPV infection is uncommon in Malaysia	16 (51)	12(38)	72 (225)
3	HPV is responsible for sexually transmitted	26 (81)	8 (26)	66 (207)
4	HPV is transmitted via close skin-to-skin contact	12 (39)	24 (75)	64 (200)
5	Smoking can increase the risk of getting HPV Infection	28 (87)	15 (47)	57 (180)
6	People can get HPV infection for a long time without knowing it	42 (132)	4 (12)	54 (170)
7	HPV can cause genital warts	22 (70)	8 (24)	70 (220)
8	Men can be infected by HPV	15 (48)	27 (85)	58 (181)
9	Men also have a potential to develop cancer due to HPV infection	16 (49)	21 (67)	63 (198)
10	Do you know about cervical cancer?	42 (131)	13 (41)	45 (142)
11	HPV can lead to cervical cancer	39 (122)	9 (27)	52 (165)
12	Cervical cancer can affect men	11 (36)	29 (90)	60 (188)
13	HPV types 16 and 18 will most likely cause cervical cancer	15 (46)	2 (6)	83 (262)
14	Pap smear test is a screening test to detect cervical cancer	41 (129)	1 (4)	58 (181)
No	**Knowledge of HPV vaccination**	**Correct**	**Incorrect**	**I don't know**
1	Do you know about the HPV vaccine?	37 (117)	16 (50)	47 (147)
2	HPV vaccination is currently offered freely to secondary school girl	79 (247)	2 (6)	19 (61)
3	HPV vaccine is delivered in a series of 2 shots injection over 6 month schedule	45 (141)	7 (23)	48 (150)
4	HPV vaccine can prevent the development of genital warts & cervical cancer	49 (153)	2 (7)	49 (154)
5	HPV vaccine is most effective on someone who are not sexually active	39 (123)	2 (5)	59 (186)
6	Vaccination is allowed in Islam and other religion	62 (196)	2 (6)	36 (112)

3.3 Acceptance of HPV Vaccination

The number of respondents that indicated their intention to get vaccinated against HPV was significantly higher (n = 216, 69%) compared to those not in favour of vaccination (n=30, 10%) and those that were unsure (n = 68, 22%; P < 0.01) (Table 3). The main reasons for acceptance of HPV vaccination was to protect themselves from cervical cancer (n = 151, 60%). Concerns regarding safety, side-effects and efficacy were the main reason for non-acceptance of HPV vaccination (n = 6, 35%). The mean HPV knowledge score (mean ± SD: 3.99 ± 3.26) was higher in respondents that favoured vaccinations compared to those that did not favour (mean ± SD: 3.50 ± 3.63) or were unsure of (mean ± SD: 1.97 ± 2.51; P < 0.01) HPV vaccinations. This was similarly observed in the scores of HPV vaccination knowledge (mean ± SD, yes: 3.60 ± 1.76, no: 2.93 ± 2.02, unsure; 1.63 ± 1.81: P < .01) and overall HPV knowledge scores (mean ± SD, yes: 7.59 ± 4.54, no: 6.43 ± 5.25, unsure; 3.60 ± 3.40: P = 0.03). There was no significant finding between acceptance of HPV vaccination and demographics of the respondents.

Table 3. Acceptance of HPV vaccination among the study population (n=314)

Characteristics	n (%)
Are you in favour of vaccinations in general	
Yes	216 (69)
No	30 (10)
Don't know	68 (22)
Reasons of acceptance	
Recommended by healthcare professional	33(13)
Had many friends getting the vaccine	14(6)
Recommended by parents	53(21)
To protect from cervical cancer	151(60)
Others	0 (0)
Reason of non-acceptance	
Not sexually active	1 (6)
Concerns about the safety/ side effect/ efficacy	6 (35)
Do not know where to get it	5 (29)
Parents do not allow	5 (29)
Not suggested by healthcare professionals	1 (6)
Others	0 (0)

3.4 Discussion

The national HPV vaccination program in Malaysia provides an opportunity for the younger population to reduce their cervical cancer risk. However, vaccination programs have had poor uptake in most Asian countries with less than 10% HPV vaccine completion rates reported around the region [14]. In the current work, we were able to successfully assess secondary school students' HPV knowledge and to understand reasons for the lack of vaccination acceptance among our younger population. The present study demographics well reflected the Malaysian population, with the majority being Malay, Chinese followed by Indian ethnicity [4]. Demographically, Malays make up 70% of the Malaysian population followed by 20% Chinese and 10% Indians [5,6]. This was also similar to initial HPV work in Malaysian students [15]. During the early phase of the national HPV vaccination program in Malaysia, most secondary school students demonstrated inadequate knowledge of HPV and cervical cancer [15]. Over the years, various now established programs have been provided, including social media, newspapers, magazines, television and radio campaign [15]. Nevertheless, there has been a lack of work assessing the current students' knowledge on HPV vaccination and effectiveness of HPV information dissemination.

Despite running the HPV vaccination program for many years, low overall knowledge of HPV was observed among secondary school students in the current study population. This was similar to previous work on local secondary school students [15], as well as those in universities [16]. Work involving students in Hong Kong also suggests that respondents aged 13-20 years old had very limited knowledge of HPV and its link to cervical cancer [17]. In England, more than half of female students aged between 15-16 years old were also noted to have low knowledge of HPV and the need for screening [18]. The level of knowledge among school students is worrying, and suggests the need for a more efficient method to deliver information on the risk of cervical cancer. Although current programs are available to the public, it is less targeted for the younger generation. Exposing them directly to HPV and HPV vaccination may increase their awareness of the need for prevention. This is clearly seen in respondents that were aware of a family member being vaccinated against HPV.

Those that were aware of the need for HPV vaccination were more likely to know more about HPV, similar to previous reports [19].

In spite of the low knowledge of HPV, more than half of the respondents were in favour of HPV vaccination. It was clearly observed that those in favour of vaccination had a higher level of knowledge, similarly observed in previous work [17,18]. Most striking was the fact that those that were unsure of accepting a HPV vaccination among our respondents obtained only 1-2 correct responses from a total of 20 items. The strong link between knowledge and acceptance of vaccination strengthens the need for establishing appropriate education within the targeted audience and their parents. Although our respondents would require informed consent from their parents before a vaccination is given, work has shown that parents also benefit when education is disseminated to the child [20]. Among other common reasons for non-vaccination were concerns about safety, side-effect and provider non-recommendation [17,18, 19], which was similar to the current study. With a tailored educational program, common vaccination concerns could also be addressed.

The aim of the study to identify HPV knowledge among female secondary school student was successful achieved. However, as with all questionnaire-based surveys, the results if this work is subject to a few limitations. Firstly, this was a self-reported questionnaire and hence, the results are based on the honesty of the respondents. Generalization of the results should also be done with caution as the respondents were from one of 87 districts within Malaysia. Future work could be done in a larger sample from each state within Malaysia.

4. CONCLUSION

Malaysia is among one of a few countries within the Asian region that provides HPV vaccines as part of their national health program. Unfortunately, the acceptance rate of HPV vaccines within the Asian region is known to be poor. In Malaysia, many students are inadequately equipped with HPV knowledge and its prevention. As such, the community may disregard HPV vaccines as priority. To that end, a much more robust educational program should be developed. This program should target the younger generation, as well as their parents. In order to ensure optimum effectiveness, development of the educational program should include healthcare professionals, pharmaceutical industry, carers and students. It is with hope that HPV knowledge can be improved among the public in an attempt to reduce the risk of cervical cancer within the population.

CONSENT

All authors declare that informed consent was obtained for the respondents.

ETHICAL APPROVAL

Ethical approval was obtained from the National Medical Research Register (NMRR) and Medical Research and Ethic Committee (MREC) (ID: NMRR-16-2710-33553).

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Banura C, Mirembe FM, Katahoire AR, Namujju PB, Mbidde EK. Universal routine HPV vaccination for young girls in Uganda: A review of opportunities and potential obstacles. Infectious Agents and Cancer. 2012;7(1):24.
2. Mariani L, Pagliusi S. Vaccination and screening programs: Harmonizing prevention strategies for HPV-related diseases. Journal of Experimental & Clinical Cancer Research. 2008;27(1):84.
3. Perlman S, Wamai RG, Bain PA, Welty T, Welty E, Ogembo JG. Knowledge and awareness of HPV vaccine and acceptability to vaccinate in sub-Saharan Africa: A systematic review. PloS One. 2014;9(3):e90912.
4. Bruni L, Barrionuevo-Rosas L, Albero G, Serrano B, Mena M, Gómez D, Muñoz J, Bosch FX, de Sanjosé S. ICO Information Centre on HPV and Cancer (HPV Information Centre). Human papillomavirus and related diseases in Malaysia. Summary Report 27 July 2017. [28 September 2017].

5. Devi BC, Tang TS, Gerard LC. Preliminary results from the pilot study on the National Cancer Patient Registry--Cervical Cancer. The Medical Journal of Malaysia. 2008;63: 63-5.
6. Othman NH, Rebolj M. Challenges to cervical cancer screening in a developing country: The case of Malaysia. Asian Pac J Cancer Prev. 2009;10:747-52.
7. Ezat WP, Aljunid S. Cost-effectiveness of HPV vaccination in the prevention of cervical cancer in Malaysia. Asian Pac J Cancer Prev. 2010;11(1):79-90.
8. Chow SN, Soon R, Park JS, Pancharoen C, Qiao YL, Basu P, Ngan HY. Knowledge, attitudes, and communication around human papillomavirus (HPV) vaccination amongst urban Asian mothers and physicians. Vaccine. 2010;28(22):3809-17.
9. Ezat SW, Hod R, Mustafa J, Mohd D, Ahmad ZH, Sulaiman AS, Azman A. National HPV immunisation programme: knowledge and acceptance of mothers attending an obstetrics clinic at a teaching hospital, Kuala Lumpur. Asian Pacific Journal of Cancer Prevention. 2013;14(5): 2991-9.
10. Al-Dubai SA, Alshagga MA, Al-Naggar RA, Al-Jashamy K, Baobaid MF, Tuang CP. Knowledge, attitudes and barriers for human papilloma virus (HPV) vaccines among Malaysian women. Asian Pac J Cancer Prev. 2010;11(4):887-92.
11. Sam IC, Wong LP, Rampal S, Leong YH, Pang CF, Tai YT, Tee HC, Kahar-Bador M. Maternal acceptance of human papillomavirus vaccine in Malaysia. Journal of Adolescent Health. 2009; 44(6):610-2.
12. Klug SJ, Hukelmann M, Blettner M. Knowledge about infection with human papillomavirus: A systematic review. Prev Med. 2008;46:87-98.
13. Geneti HB, Hailu DA, Muleta G. Assessment of the knowledge, attitude and acceptability towards Human Papilloma Virus and its vaccine among undergraduate female medical students, South-West Ethiopia. Gynecol Obstet. 2016;6:410.
DOI: 10.4172/2161-0932.1000410
14. Lu CY, Santosham M. Survey of national immunization programs and vaccine coverage rates in Asia Pacific countries. Vaccine. 2012;30(13):2250-5.
15. Rashwan H, Ishak I, Sawalludin N. Knowledge and views of secondary school students in Kuala Lumpur on cervical cancer and its prevention. Asian Pacific Journal of Cancer Prevention. 2013;14(4): 2545-9.
16. Wong LP, Sam IC. Ethnically diverse female university students' knowledge and attitudes toward human papillomavirus (HPV), HPV vaccination and cervical cancer. European Journal of Obstetrics & Gynecology and Reproductive Biology. 2010;148(1):90-5.
17. Kwan TT, Chan KK, Yip AM, Tam KF, Cheung AN, Lee PW, Ngan HY. Barriers and facilitators to human papillomavirus vaccination among Chinese adolescent girls in Hong Kong: A qualitative–quantitative study. Sexually transmitted infections. 2008;84(3):227-32.
18. Bowyer HL, Marlow LA, Hibbitts S, Pollock KG, Waller J. Knowledge and awareness of HPV and the HPV vaccine among young women in the first routinely vaccinated cohort in England. Vaccine. 2013;31(7): 1051-6.
19. Tang SY, Liu ZH, Li L, Cai HL, Wan YP. Awareness and knowledge about human papillomavirus among high school students in China. The Journal of reproductive medicine. 2014;59(1-2):44-50.
20. Shourie S, Jackson C, Cheater FM, Bekker HL, Edlin R, Tubeuf S, Harrison W, McAleese E, Schweiger M, Bleasby B, Hammond L. A cluster randomised controlled trial of a web based decision aid to support parents' decisions about their child's Measles Mumps and Rubella (MMR) Vaccination. Vaccine. 2013;31(50): 6003-10.

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