

Acceptance and Associated Factors of HPV Vaccination among Young Male Malaysians

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Abstract

Objective: The objective of this study was to determine the acceptance and associated factors of HPV vaccine among Young Malaysian males.

Methodology: A cross sectional study was conducted among male university students. Self-administered questionnaires were distributed randomly to all faculties of the university. The protocol of this study was approved by the ethics committee of Management and Science University. Data analysis was performed using the Statistical Package for Social Science (SPSS) version 13. Student's t-test and ANOVA was used in univariate analysis. Multiple linear regression was used in multivariate analysis.

Results: A total number of 350 male university students participated in this study. The majority of them were Malay, single, non-alcohol drinkers, non-smokers, never taken marijuana, and are all from non-medical faculty and never heard about HPV vaccine (61.4%, 95.7%, 72.6%, 56.6%, 88.9%, 52.9%, 63.4%; respectively). With HPV vaccine acceptance among male adults, more than half of the study participants (55.4%) were willing to accept the HPV vaccine if available. The factors that influenced the acceptance of HPV among male adults were race, marital status, smoking, type of faculty and taking marijuana ($p < 0.0001$, $p < 0.001$, $p = 0.025$, $p < 0.0001$, $p < 0.0001$; respectively).

Conclusion: More than half of the study participants were willing to accept the HPV vaccine if available. Race, marital status, smoking, type of faculty and taking marijuana were factors that significantly influenced the acceptance of male students towards HPV vaccine. Raising men's awareness of the risks of HPV is also essential.

Keywords: HPV vaccine; Acceptance; Male

Introduction

HPV is more common among women and it was also found that 51.1% of men tended to carry multiple strains of HPV [1]. Approximately 73% of men have been infected with HPV [2]. These infections have led to anal cancers, oro-pharyngeal cancers, and penile cancers (93%, 63%, 36%; respectively). With regard to gay and bisexual men, prevalence of HPV is 60% in men without HIV, and close to 90% in those with HIV. Rates of anal cancer were also found to be higher in men having sex with men. Taking the HPV vaccine serves as a preventative measure, especially when administered prior to sexual debut. Unfortunately, limited knowledge of HPV associated with health issues for men was found by Reiter et al. [2].

According to several studies regarding HPV, one of the common themes was that awareness of HPV in men was extremely low, and that if awareness were to increase, then the acceptance of vaccine that prevented certain stands of HPV known to cause genital warts and cervical cancer would be much greater [3].

The U.S. Food and Drug Administration (FDA) approved a quadrivalent HPV vaccine against HPV types 6, 11, 16, and 18 for use in males ages 9–26 in October 2009 [4]. Soon after, the Advisory Committee on Immunization Practices (ACIP) provided a permissive recommendation allowing for the administration of the 3-dose vaccine series to males ages 9–26 but not making it part of their routine vaccination schedule [4]. The ACIP also recommended HPV vaccine to be covered by the Vaccines for Children (VFC) program for eligible males ages 18 or younger [5]. Coverage of the vaccine for males is not clear for private health insurance plans, though not all plans currently provide coverage [6]. The FDA has approved HPV vaccine for genital warts and anal cancer prevention in males [7,8], while the ACIP

recommends the vaccine to reduce the likelihood of genital warts in males [1] and considers its potential to prevent cancer in males. In addition to these individual health benefits, vaccinating males ages 9–26 against HPV also has considerable public health and economic benefits [9].

Human papillomavirus (HPV) infection is widespread among males, with recent prevalence estimates ranging up to 73% [10-13]. HPV vaccine attitudes have been examined in females and in parents, only a few such studies have included adult males [3,14,15].

Human papillomavirus (HPV) is the primary causal agent of cervical cancer and also plays an etiologic role in malignancies of the vagina, vulva, anus, penis, oral cavity and oropharynx [16]. Two prophylactic HPV vaccines have been developed and are available internationally. The quadrivalent vaccine against HPV 6, 11, 16 and 18 has been available in the United States since June 2006 when it was approved for use in females ages 9–26 years for the prevention of cervical cancer and anogenital warts [17]. In 2009, a bivalent vaccine against HPV 16 and 18 was approved in the US for females of the same age group for the prevention of cervical cancer. Also in 2009, the

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quadrivalent vaccine was approved for use in the US for the prevention of anogenital warts in males ages 9–26.

Human papillomavirus (HPV) vaccine is now recommended for males. The United States Food and Drug Administration (FDA) approved quadrivalent HPV vaccine (HPV4) for males aged 9 to 26 in October 2009 [8], and the Advisory Committee on Immunization Practices (ACIP) made a provisional permissive recommendation for this group soon after. HPV4's indication is for genital wart prevention in males, but it is also indicated for females to prevent cervical cancer as well as genital warts [17].

Due to the different culture and religion from the western countries, we want to explore the acceptance of HPV vaccine among male adults in Malaysia.

Indeed, a common lay term for HPV4 is “the cervical cancer vaccine”. While HPV4 can prevent two viral types that cause genital warts in men, it also prevents two other oncogenic HPV types that can cause oral, anal, and penile cancers in men [13,18,19]. Preliminary data from trials examining HPV4 in men are promising enough that some types of cancer could one day be included as an indication for men [20]. Bivalent HPV vaccine (HPV2) does not offer protection against HPV types associated with genital warts and is not currently licensed for use in males in the United States [8].

Messages about penile cancer may need more attention grabbing for men than other cancers, such as oral cancer. HPV-infected men face potentially severe health consequences although most infections resolve spontaneously. An estimated 63% of oropharyngeal cancers, 93% of anal cancers, and 36% of penile cancers in the United States (US) are attributable to infection with oncogenic HPV types (mainly types 16 and 18) [21]. Nononcogenic HPV types (types 6 and 11) cause anogenital warts [22].

Several countries have licensed HPV vaccine for use in males, though the United States is not currently one of them. 20 Austria is the only country that has currently recommended HPV vaccination for young males [23].

Human papillomavirus (HPV) infection is the most common sexually transmitted infection (STI) in the United States (U.S.) [24]. Prevalence estimates of infection among asymptomatic males are typically over 20% and range as high as 73% [10]. Although infection is generally less common among adolescent and young adult males compared to older males [25-27] state that infection often occurs soon after sexual debut or the introduction of new sexual partners [28].

HPV infections have the potential to cause various adverse health outcomes in males, including genital warts [29,30] and some types of cancer (anal, penile, and oral cancers) [31]. HPV concordance levels are high among sexual partners [32], so infected males also put their female partners at increased risk of cervical disease [33,34].

The FDA has approved HPV vaccine for genital warts and anal cancer prevention in males [7], while the ACIP recommends the vaccine to reduce the likelihood of genital warts in males (Centers for Disease Control and Prevention 2010) and considers its potential to prevent cancer in males. In addition to these individual health benefits, vaccinating males ages 9–26 against HPV also has considerable public health and economic benefits [9].

HPV has not been approved in Malaysia. Several studies have already been conducted among Malaysian women [35-38]. However, this study is the first one conducted among males in Malaysia to fill in

the gap of knowledge and to determine the acceptance and associated factors of HPV vaccine among males in Malaysia.

Methodology

A cross sectional study was conducted in the period during the academic year 2011/ 2012 from November 2011 till March 2012 in Management and Science University (MSU), Shah Alam, Selangor, Malaysia. A total number of 350 male university students were participated in this study recruited from the following faculties: International Medical School (IMS), Faculty of Health and Life Sciences (FHLS), Faculty of Business management and professional studies (FBMP), and Faculty of Information Sciences and Engineering (FISE). HPV has not been approved in Malaysia and none of the participants had received the vaccine.

Self-administered questionnaires were distributed randomly using simple random sampling technique; the star point of selection was choosing table number 3 and give the questionnaire to all the students in that table, then table number 6, then table number 9 and continue until we fulfill the sample size. All faculties of MSU in the library, cafeterias and classes were included. Inclusion criteria were male Malaysian, aged more than 18 years old. The questionnaire consists of socio-demographic characteristics such as age, sex, marital status, family monthly income and race. The questionnaire used in this study was adopted from a previous study done by [39] which consists of knowledge towards HPV and its vaccine, intention to get the vaccine, and sexual contact with a female. The protocol of this study was approved by the ethics committee of Management and Science University. Consent form was obtained from students before they answered the questionnaire. Data analysis was performed using the Statistical Package for Social Science (SPSS) version 13. Student's t-test and ANOVA was used in univariate analysis. Multiple linear regressions were used in multivariate analysis.

Results

A total number of 350 male university students participated in this study. The mean age was $21.47 \pm SD 1.82$; the maximum age was 27 years and the minimum was 18 years. The majority of them were Malay, single, non-alcohol drinkers, non-smokers, never taken marijuana, from non-medical faculty, never heard about HPV vaccine (61.4%, 95.7%, 72.6%, 56.6%, 88.9%, 52.9%, 63.4%; respectively) (Table 1). Regarding the factors that influence the acceptance of HPV among male adults were race, marital status, smoking, type of faculty and taking marijuana ($p < 0.0001$, $p < 0.001$, $p = 0.025$, $p < 0.0001$, $p < 0.0001$; respectively). For race, Post Hoc test showed some differences between Malay and Chinese on the one hand ($p = 0.0009$); and on the other hand, some differences existed between Malay and non Indian ($p = 0.002$). Some differences also existed between Malay and other races ($p < 0.0001$).

Regarding the risk factors towards HPV infections, some of the participants were homosexual oriented (13.1%). The majority of them started first sexual intercourse at age 18 and above, circumcised (74.0%, 63.1%; respectively). About 5.1% reported history of Sexual transmitted disease (STD) and 9.4% reported history of genital warts (Table 2). For sexual orientation, Post Hoc test showed some differences between heterosexual and homosexual on the one hand ($p < 0.0001$); and on the other hand, some differences existed between heterosexual and non sexual orientations ($p = 0.001$). 3.5 ($p = 0.019$). For age at first sexual intercourse, Post Hoc test showed some differences between < 18 years and those ≥ 18 years old on the one hand ($p < 0.0001$); and on the

Variable	Categories	Number	Percentage (%)	p-value
Race	Malay	215	61.4	<0.0001
	Chinese	45	12.9	
	Indian	60	17.1	
	Others	30	8.6	
Marital status	Single	335	95.7	<0.001
	Ever married	15	4.3	
Drinking alcohol	Yes	96	27.4	0.839
	No	254	72.6	
Smoking	Yes	152	43.4	0.025
	No	198	56.6	
Taking Marijuana	Yes	39	11.1	< 0.0001
	No	311	88.9	
Faculty	Medical	165	47.1	<0.0001
	Non-Medical	185	52.9	
heard about HPV vaccine	Yes	128	38.6	0.494
	No	222	63.4	

Table 1: Socio-demographic characteristics of the study participants (n=350).

Variable	Categories	Number	Percentage (%)	p-value
Sexual status	Heterosexual	162	46.3	<0.0001
	Homosexual	46	13.1	
	None	142	40.6	
Age at first sexual intercourse	<18 years old	78	22.3	<0.0001
	≥18 years old	259	74.0	
	Non	13	3.7	
Circumcised	Yes	221	63.1	<0.0001
	No	129	36.9	
History of STD	Yes	18	5.1	<0.0001
	No	332	94.9	
History of genital warts	Yes	33	9.4	<0.0001
	No	317	90.6	

Table 2: Risk factors towards HPV infections (n=350).

*Barriers	Number	Percentage (%)
Cost of the vaccine	213	30%
If I don't think the vaccine will work	124	18%
No time off work and/ or school to get to the clinic for the vaccination	111	16%
Going to the clinic for 3 shots over 6 months	99	14%
Fear of needle	64	9%
Fear of vaccine	46	7%
Transportation to the clinic to get the vaccination	38	6%

*The participants were allowed to choose three options only

Table 3: Barriers towards HPV vaccine acceptance among male adults.

other hand, some differences existed between those who started sexual intercourse <18 years and none (p < 0.001).

Regarding HPV vaccine acceptance among male adults; in general, more than half of the study participants (55.4%) were willing to accept the HPV vaccine if available. The majority of them were likely (39.1%) and very likely (16.3%) to accept the HPV vaccine among male adults (Figure 1).

Regarding the knowledge needed before making a decision to get the vaccine, most of the respondents (22%) were concerned about the side effects of HPV vaccine. Second, they were also concerned about the effectiveness of this vaccine with a percentage of 18%. Third, they enquired about the safety of the vaccine (18%). The fourth factor that came into the male students' consideration before getting vaccinated was the cost of the vaccination with a percentage of 12%. The fifth factor

they considered before getting vaccinated was the advice of health care provider (7%). The sixth factor considered by all the respondents was the make-up of the vaccine (7%). The seventh factor was the pain involved in taking the vaccination (5%). The eighth factor was the approval of the sex partner (5%). The ninth factor was the recommendation of friends or family (4%). Finally 2% of the participants were concerned about the publicity of the vaccination (Figure 2).

Regarding the barriers towards HPV vaccine among male adults, the highest barrier reported among the participants was the cost (30%); followed by the efficacy of the vaccine (18%). The lowest barrier reported among the study participants was lack

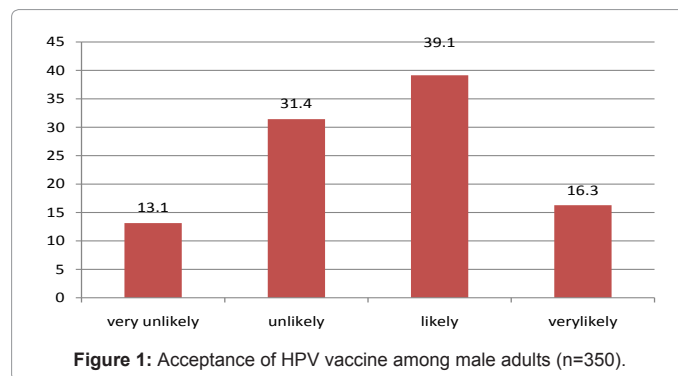
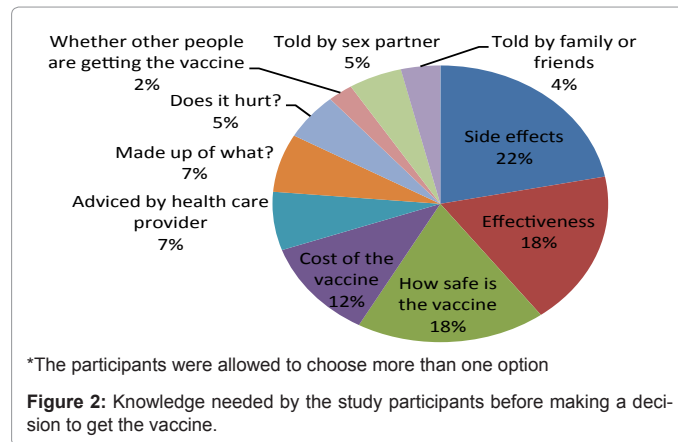


Figure 1: Acceptance of HPV vaccine among male adults (n=350).



*The participants were allowed to choose more than one option

Figure 2: Knowledge needed by the study participants before making a decision to get the vaccine.

	B	SE	Beta	p-value
Constant	0.985			
Race				
Malay	Ref.	Ref.	Ref.	0.008
Non-Malay	-0.225	0.085	0.120	
Taking Marijuana				
Yes	Ref.	Ref.	Ref.	<0.0001
No	1.015	0.109	0.350	
Faculty				
Medical	Ref.	Ref.	Ref.	<0.0001
Non-medical	1.46	0.070	0.802	
Sexual orientation				
Homosexual	Ref.	Ref.	Ref.	0.020
Heterosexual	0.188	0.080	0.070	
Circumcised				
Yes	Ref.	Ref.	Ref.	<0.0001
No	0.413	0.091	0.219	

[R²=0.778; p value <0.0001]

Table 4: Predictable Model for acceptance of HPV vaccine among males using Multiple linear regression (n=350).

In multivariate analysis (Table 4), race, taking marijuana, type of faculty, sexual orientation and Circumcised significantly influenced the acceptance of HPV among male adults ($p=0.008$, $p<0.0001$, $p<0.0001$, $p=0.020$, $p<0.0001$; respectively). Non Malay had an average of 0.225 points lower acceptance scores of HPV vaccine than Malay ($p=0.008$). Those who never took marijuana had an average of 1.015 points higher acceptance score of HPV than those who take marijuana ($p<0.0001$). Non-medical students had an average of 1.46 points higher acceptance scores than medical students (<0.0001). Heterosexual students had an average of 0.188 points higher acceptance score of HPV than homosexual students ($p=0.020$). Non circumcised students had an average of 0.413 points higher acceptance than circumcised students ($p<0.0001$). Excluded variables from the model were marital status, age at first sexual intercourse, history of STD, age, ever heard about HPV vaccine, smoking, and alcohol.

Discussion

This study examined the acceptability of HPV vaccination and associated factors among male adults in Malaysia. If HPV vaccine approved for Malaysian males, HPV vaccine may offer great benefits to young adults due to the increasing numbers of sexual activities reported among Malaysian youth and high rates of HPV infections [40-42]. Moreover, HPV is associated with vagina, vulva, anus, penis, oral cavity and oropharynx cancer [16,31]. HPV infections also have the potential to cause various adverse health outcomes in males, including genital warts [29,30]. HPV concordance levels are high among sexual partners [32], so infected males also put their female partners at increased risk of cervical disease [33,34]. This study is the first of its kind to determine the acceptance of HPV vaccine among males in Malaysia. It helps in planning the future policy of health care system which focuses on the primary prevention.

Perceived benefit of getting vaccinated was another factor noted to affect males' acceptance of the HPV vaccine [3,15,43]. A study found that the perceived benefits of the HPV vaccine that were the most likely reasons for men to get immunized included a desire to stay healthy, to prevent cancer in sexual partners, and to prevent anal, penile, and head and neck cancers. Other frequently selected reasons in this study included the fear of cancer and the prevention of genital warts [44]. Similarly, a study of Swedish high school students demonstrated that both males and females thought that protection against an incurable disease would be the most motivating factor for STI vaccination [43].

Regarding the knowledge of men towards HPV vaccine, only 38.6% heard about HPV vaccine. A similar study reported that most men had heard of HPV vaccine (63%) [2]. Studies conducted in the United States have generally found that although many males may report having heard of HPV, further questioning usually revealed that baseline knowledge regarding HPV infection was low [2,3,44]. Studies also demonstrated that males generally had limited to moderate knowledge regarding the availability of an HPV vaccine ranging from 1.1% to 63% of study participants [2,3,43,45,46]. Studies also found that many men were unaware of the connection between HPV and anogenital cancers in men [2,3]. HPV vaccine acceptance attitudes was reported in several studies [2,3,46,47]. Additionally, a U.S. study of university men and women found that participants who were more knowledgeable about HPV demonstrated greater intent to receive the HPV vaccine [48].

In this study, majority of participants (55.4%) were likely or very likely to **accept** the vaccine among male adults. Higher rate than the current study was reported by Hernandez et al. [39] that, in general, 69% of men reported they were likely or very likely to be vaccinated

against HPV if a prophylactic vaccine were available. A review study reported that the acceptability rate was higher than the current study's which ranged between 74%-78% among college males [49]. Lower rate than the current study's reported that 37% were willing to get HPV vaccine [2]. Several studies found that a majority of their male participants were more likely to accept the HPV vaccine if it also protected against genital warts in addition to cervical cancer [46-48]. Another study showed lower rate of males' interest in HPV vaccine in that only 33% of the study subjects expressed interest in getting vaccinated against HPV [44].

In this study the concern about HPV vaccine was the side effects and effectiveness of HPV vaccine (22%, 18%; respectively). Safety and cost of the vaccine (18%, 12%; respectively) were also important among the participants. Similar findings were reported by Hernandez et al [39] in which men most frequently cited side effects (69%), efficacy (65%) and safety (63%) as the major factors that would influence their decision to be vaccinated against HPV.

Regarding the factors that significantly influenced the acceptance of HPV vaccine among male adults, they were race, marital status, smoking, taking marijuana, type of faculty and Sexual orientation. This may be due to the awareness of the heterosexual about their health and their engagement in healthy lifestyle. Furthermore, the possible reason may be due to the small number of the homosexual reported in this study. Another possible explanation could be referred to the religious and culture factors in this country. An opposite finding was reported in a study of US men, in which HPV vaccine acceptance was greater among men engaged in high-risk sexual behaviors [15]. This may be due to the religious and culture changes. A similar finding by Ferris et al. [15] found that higher education, and regular tobacco use were the factors that influenced the acceptance of HPV vaccine among the participants. Men who had a higher number of lifetime sex partners were more likely to report greater interest in the HPV vaccine compared to men who were less sexually active or nonsexually active [2,3,15,48].

Barriers

In this study, vaccine side effects were the most important factor that men indicated to influence their HPV vaccination decision. A similar study was reported by Hernandez et al. [39] in which vaccine side effects were the most important factor that influenced men in their HPV vaccination decisions. This may also be attributed to increased media attention in Malaysian even-though the media focus is on HPV vaccine for women.

A similar study, to this present study, found that Vaccine safety was another important consideration in a man's decision to be vaccinated [39]. Efficacy is an important predictor of HPV vaccine acceptability among female adults and parents [50].

In this study, lack of time off work or school to get to the clinic for the vaccination was considered one of the barriers among the study participants. A similar study reported by Hernandez et al [39] showed that time off school or work and the 3-visit vaccine schedule was also considered to be greater potential barriers among young men.

In this study, one of the factors that the respondents considered before getting vaccinated was the advice of health care provider with a percentage of 7%. It is well known that healthcare providers are one of the main sources of HPV vaccine information for parents [51], and they will play an increasingly important role in vaccine acceptability and uptake as time since vaccine licensure for males passes. Physician recommendation was another important factor that

studies found to affect men's acceptance of HPV vaccination. Several studies demonstrated that men would be more likely to accept the HPV vaccine if their physician recommended it [2,3,15,44,48].

Furthermore, Gerend and Barley [3] reported that the factors related to taking the vaccine were perceived benefits, perceived costs, self efficacy, and perceived norms.

Knowledge needed by the study participants before making a decision to get the vaccine

Perceived norms for HPV vaccination may also play an important role in vaccine acceptance among males. A study conducted in the United States found that young adult men who believed their friends would get HPV vaccinated reported a higher intent to get vaccinated themselves [3]. Similarly, two other studies found that men would more likely accept the HPV vaccine if it were recommended by a spouse, parent, or friend [44,48]. Participants of a focus group study identified stigma associated with obtaining a vaccine preventing an STI as a potential barrier to HPV vaccination [52].

Cost was also a major factor found to influence the decision of obtaining the HPV vaccine in several studies [3,15,44,46,48,52-54]. A study conducted in Malaysia found that almost all of the focus group participants cited high cost of the HPV vaccine as a key barrier to vaccination [55]. Several studies found that factors such as research-based safety and efficacy of the HPV vaccine in addition to vaccine adverse reactions were other important considerations that would influence men's HPV vaccination decisions [15,54,55].

Limitation

The limitation of this study is that the results were based on a self-report survey, which could have included both participant bias and dishonesty. Furthermore, this study is a cross-sectional design, which supplied us with information for a particular point in time.

However, this study may help in planning the future policy of health care system which focuses on the primary prevention.

Recomenations

Education campaigns should emphasize the potential dangers of HPV for both males and females as well as the prevalence of the virus, as a previous study has found people tend to underestimate the seriousness of common health problems [56].

Since Malaysia is a multi-raced country, it is crucial to carry on education campaigns, in this regard, in all the spoken languages (English, Malay, Tamil and Mandarin).

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