

Human Papillomavirus (HPV) Infection Awareness and Vaccine Acceptance among High-risk Men in Perak, Malaysia

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ABSTRAK

Jangkitan Human Papillomavirus (HPV) boleh menyebabkan masalah ketuat pada kepala dan pelbagai kanser. Di Malaysia, perlindungan terhadap HPV disediakan untuk kaum perempuan manakala kaum lelaki dijangka mendapat manfaat dari imuniti kelompok. Walau bagaimanapun, lelaki homoseksual and biseksual tidak akan mendapat manfaat ini. Oleh itu, adalah penting untuk menilai kesedaran mereka tentang penyakit ini dan vaksin HPV supaya mereka boleh diberi kaunseling yang sewajarnya. Objektif kajian ini adalah untuk menilai kesedaran tentang HPV, tahap penerimaan vaksin, faktor pendorong dan penghalang untuk vaksin di kalangan lelaki berisiko tinggi dengan menggunakan soal selidik. Seramai 194 lelaki berumur antara 18 hingga 45 tahun dari klinik "Human Immunodeficiency Virus" (HIV) dan "Sexually Transmitted Disease" (STD) sebuah hospital rujukan dan enam klinik kesihatan di Perak telah mengambil bahagian dalam kajian ini. Hanya 35.6% pernah mendengar tentang HPV dan vaksin HPV (21.6%). Walau bagaimanapun, kebanyakan daripada mereka (87.1%) bersedia untuk menerima vaksin setelah mendapat maklumat tentang HPV dan vaksin HPV. Faktor pendorong utama untuk mendapatkan vaksin adalah saranan dari doktor (94.3%), kelulusan kerajaan (84.5%) dan vaksinasi percuma (82%), manakala penghalang utama adalah kos (68.0%) dan kesan sampingan (49.5%). Hasil kajian ini menunjukkan bahawa tahap kesedaran tentang HPV dan vaksin adalah rendah di kalangan lelaki yang berisiko tinggi. Walau bagaimanapun, mereka bersedia menerima vaksin HPV setelah mendapat maklumat tentang HPV dan vaksin. Galakan daripada doktor dan kelulusan kerajaan merupakan pendorong utama untuk menerima vaksin manakala kos dan kesan sampingan merupakan halangan utama terhadap vaksin HPV.

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Kata kunci: Human Papillomavirus, HPV, vaksin papillomavirus, vaksinasi

ABSTRACT

Human Papillomavirus (HPV) causes anogenital warts and malignancies in both men and women. In Malaysia, HPV vaccine is currently available for young girls while men are expected to benefit from herd immunity. However, high-risk men e.g. those who practice homo and bisexual activities may not benefit from this herd immunity. Hence, it is important to assess their awareness of HPV and vaccine acceptance for appropriate counselling on vaccination. The objective of this study was to assess HPV and vaccine awareness, its acceptance, facilitators, and barriers among high-risk men. Men between the ages of 18 to 45 years from the Human Immunodeficiency Virus (HIV) and Sexually transmitted Disease (STD) clinics of a tertiary hospital and six Health Clinics in Perak were invited to participate. HPV awareness, vaccine acceptance, facilitators, and barriers to vaccination were assessed using a self-administered questionnaire. A total of 194 men participated in this study. Only a small percentage of them (35.6%) were aware about HPV and HPV vaccine (21.6%). However, most of them (87.1%) were willing to accept vaccination after receiving the necessary information. Common facilitators for vaccination were doctor's recommendation (94.3%) government approval (84.5%) and free vaccination (82%) while the most common barriers were cost (68.0%) and side effects of the vaccine (49.5%). Our study showed low-level HPV and vaccine awareness among high-risk men. However, majority of them were willing to accept HPV vaccination. Recommendations from doctors and government approval were the two most important facilitators while cost and side effects were the common barriers to HPV vaccination.

Keywords: human papillomaviruses, papillomavirus vaccines, vaccination

INTRODUCTION

Human Papillomavirus (HPV) is a highly prevalent sexually transmitted infection. High risk population for sexually transmitted diseases includes lesbian, gay, bisexual, transgender and queer (LGBTQ) groups. In Malaysia, it is estimated that men who have sex with men (MSM) make up 2.2% of the adult population and these numbers may be higher (Ministry of Health

Malaysia 2018). Most educational campaigns on HPV infection and its preventative efforts focus on women and its association with cervical cancer. Assessment of HPV and HPV vaccine awareness among men are still lacking. Although universal HPV vaccination for both men and women may not be cost-effective, vaccination for these high-risk men would be useful since this population has a higher lifetime risk of HPV-related diseases. This group

also benefits the least through herd immunity from the existing girls-only HPV vaccination policy in Malaysia (Kim 2010; Deshmukh et al. 2014; Lin et al. 2017).

In general, the awareness regarding HPV and vaccination among men is found to be poor (Colón-López et al. 2012; Giuliani et al. 2016; Tian et al. 2019). But men are more likely to consider HPV vaccination, if they have awareness of HPV, recommendation by health care professionals and proven to be safe (Gerend et al. 2016; Tatar et al. 2017; Tian et al. 2019). Human Immunodeficiency Virus (HIV) that infected men were also found to be more receptive toward HPV vaccination (Hoefler et al. 2018; Tian et al. 2019). A study in China found that homosexual men with high-risk sexual behaviour; such as unprotected anal intercourse and multiple sexual partners were more willing to get HPV vaccination (Zou et al. 2016). Lower and more affordable price of the HPV vaccine was also associated with higher uptake (Sadlier et al. 2016; Tian et al. 2019).

The rising incidences of anogenital cancer among both men and women could be reduced by offering HPV vaccination to boys and men. This will require a change in HPV vaccination policy, for a universal or targeted HPV vaccination for high-risk men (Gillison et al. 2015). Currently, there is no public policy that warrants HPV vaccination for boys in Malaysia. The exclusion of boys from the current national HPV vaccination programme in Malaysia may undermine the impact of HPV-related diseases in men. High-risk

homosexual men with multiple sexual partners, with or without HIV are the key population that would benefit from HPV vaccination. Till date, there is no published data on HPV awareness among high-risk men and the factors affecting the HPV vaccine acceptance in Malaysia. Hence, this study aimed to address this gap and we hoped that the findings will be useful for future planning and implementation of HPV vaccine among high-risk men.

MATERIALS AND METHODS

This was an interventional study among men who attended the HIV and sexually transmitted disease (STD) clinic at a tertiary (Hospital Raja Permaisuri Bainun, HRPB, Ipoh) and six government primary care clinics in Kinta district of Perak state which offered HIV and STD services. Data was collected from December 2020 to April 2021 using convenience sampling. The sample size was calculated using the Kish Formula with HPV vaccine acceptance rate of 26.2%; 95% confidence interval and 7% absolute precision (Zou et al. 2016). An additional 20% was added for a possible incomplete response, giving a final sample size of 180. Male patients with above 18 years of age and fluent in Bahasa Malaysia or English were invited to join in the study. Consent was obtained from those who agreed.

The main tool used in this study was a self-administered questionnaire adapted from Belani et al. (2014). Questionnaire was obtained and used with permission from author. An expert panel consisting of a family

medicine specialist and a dermatologist evaluated the questionnaire for content validity and suitability for local use. The questionnaire was prepared in both English and Bahasa Melayu (national language) by a linguist expert and subjected to face validation and pilot testing with 20 participants from a similar background but were not involved in the final data collection process. The questionnaire was well understood and did not need modification. The questionnaire had three sections, the first section contained demographic details and awareness regarding HPV and HPV vaccine. Awareness of HPV and HPV vaccine was assessed using the question "Have you heard about HPV?" and "Have you heard about HPV vaccine? Both these questions were followed by options "yes" and "no". After the participants were assessed on their awareness of HPV infection and the HPV vaccine, they were given a pamphlet containing information regarding HPV infection in men and HPV vaccine (Centers for Disease Control and Prevention, 2015). After reading the pamphlet, the participants were given the second section of the questionnaire which assessed their acceptance, facilitators, and barriers to HPV vaccination using six statements. Each statement was followed by three to seven answer options. Participants could select more than one answer option which closely reflected their perception and acceptance regarding HPV vaccination.

Data were analysed using Statistical Package for Social Sciences (SPSS) version 26 (SPSS Inc., Chicago, IL,

USA). Ethical approval for this study was obtained from the Medical Research and Ethics Committee (MREC), Ministry of Malaysia (NMRR-19-4086-51097) and by the Research and Ethics Committee of Universiti Kebangsaan Malaysia Medical Centre (FF-2020-012).

RESULTS

A total of 194 men (N=194) participated in this study. The median age of participants was 31 years (IQR: 12) and almost half of them belonged to the Malay ethnic group (47.4%, n=92). More than half of them had tertiary education (54.1%, n=105). A large majority belonged to the low-income group (86.6%, n=168) and were single (80.9%, n=167). About 28.9% (n=56) of our study participants had more than one sexual partner in the last 12 months. More than one-third were homosexual (37.6%, n=73).

Only 35.6% (n=69) participants had heard of HPV while only 21.6% (n=42) had heard of HPV vaccine. The main sources of information regarding HPV infection were from doctors or healthcare workers (46.4%, n=32) and social media (37.7%, n=36). After a brief education on HPV infection and vaccination through the informative pamphlet, a large majority of the participants (87.1%, n=169) stated their acceptance for the HPV vaccination. Among the commonest reason for acceptance was for self (96.4%, n=163) and partner protection (88.2%, n=149). Only a small percentage (12.9%, n=25) refused vaccination mainly because they perceived that

they did not need the vaccine (72%, n=18) and were concern regarding vaccine safety (36%, n=9). Participants mostly wanted to know about the side effects of the vaccine (77.3%, n=150), cost (51.0%, n=99), and safety of the

vaccine (48.5%, n=94) before getting vaccinated. Doctor's recommendation (94.3%, n=183), government approval (84.5%, n=164), and free vaccination (82%, n=159) were top facilitators for HPV vaccination while the common

Table 1: HPV Vaccine awareness, acceptance, facilitators and barriers

Description	n (%)
HPV awareness	69 (35.6)
HPV vaccine awareness	42 (21.6)
Vaccine acceptance	169 (87.1)
Vaccine refusal	25 (12.9)
Acceptability of HPV vaccine	
Reason to accept	
To protect myself	163 (96.4)
To protect partner	149 (88.2)
To reduce cancer burden	147 (87.0)
Reason to refuse	
Do not need the vaccine	18 (72.0)
Do not trust the vaccine safety	9 (36.0)
Do not have family/friend's approval	1 (4.0)
Information required before taking the HPV vaccine	
The side effect of the vaccine	150 (77.3)
The cost of the vaccine	99 (51.0)
Vaccine safety	94 (48.5)
The efficacy of the vaccine	90 (46.4)
Number of doses required	77 (39.7)
If other people are using the vaccine	54 (27.8)
Facilitators to vaccination	
Recommended by doctor	183 (94.3)
Government approval	164 (84.5)
Free/ paid by insurance	159 (82.0)
Partner request of use	127 (65.5)
Barriers to vaccination	
Cost	132 (68.0)
Side effect	96 (49.5)
Time away from work/school	37 (19.1)
Nothing	37 (19.0)
Fear of needles	19 (9.8)
Fear of vaccine	16 (8.2)
Transportation	15 (7.7)

barriers were concerns regarding cost (68.0%, n=132) and vaccine side effects (49.5%, n=96) (Table 1). For the analysis of association, marital status was noted to be significantly associated with HPV

vaccine acceptance (Table 2).

For the association between sexual characteristics and HPV vaccine acceptance, factors that had a significant association were sexual

Table 2: Association between sociodemographic characteristics with HPV vaccine acceptance (N=194)

Variables	Frequency n (%)	HPV Vaccine Acceptance (N=194)		
		No (%)	Yes (%)	p-value
Ethnicity				
Malay	92 (47.4)	11 (44.0)	81 (47.9)	0.713
Non-Malay	102 (52.6)	14 (56.0)	88 (52.1)	
Education Level				
School (Primary & Secondary)	89 (45.9)	16 (64.0)	73 (43.2)	0.051
Tertiary	105 (54.1)	9 (36.0)	96 (56.8)	
Employment Status				
Employed	162 (83.5)	23 (92.0)	139 (82.2)	*0.384
Unemployed	32 (16.5)	2 (8.0)	30 (17.8)	
Monthly Income				
Low	168 (86.6)	22 (88.0)	146 (86.4)	*1.000
Middle	24 (12.4)	3 (12.0)	21 (12.4)	
High	2 (1.0)	0 (0.0)	2 (1.2)	
Marital Status				
Single	164 (84.5)	17 (68.0)	147 (87.0)	*0.032
Married	30 (15.5)	8 (32.0)	22 (13.0)	

*Fisher Exact Test was used. p-value <0.05 was significant

orientation, number of sexual partners, oral and anal sex practice, and self-reported history of syphilis (Table 3).

All independent variables with p -value <0.05, were selected for multiple logistic regression analysis adjusted for marital status, oral sex practise, anal sex practice, previous history of syphilis, sexual orientation and the number of sexual partners. The regression model fit reasonably well. There were no multicollinearity and interaction between the independent variables tested. There were no factors which were positively correlated with HPV vaccine acceptance. The Nagelkerke R square value for this model was 0.206 (Table 4).

DISCUSSION

The present study found that about a third of high-risk men were aware of

HPV. Similarly, a low level of HPV awareness was also noted among high risk men in China, where only about 20.6% of them were aware of HPV (Li et al 2019). The participants also had low level of HPV vaccine awareness which was also similar to earlier studies from China and Puerto Rico which was 4.8% and 28.3%, respectively (Li et al 2019; Colón-López et al. 2012). Earlier local studies found a slightly higher trend of HPV and HPV vaccine awareness (36.6 and 57.2%; 38.6% and 42.8%, respectively) (Al-Naggar 2012; Wong et al. 2019). The major difference is that, the participants in earlier local studies were mostly from the urban, low risk category while our study participants were a mixture of urban, sub-urban and high-risk participants. This is rather surprising as most high-risk patients attending sexual healthcare services are expected to have high awareness of

Table 3: Association between sexual characteristics with HPV vaccine acceptance (N=194)

Variables	Frequency n (%)	HPV Vaccine Acceptance (N=194)		
		No (%)	Yes (%)	p-value
Sexual Orientation				
MSM	129 (66.5)	11 (44.0)	118 (69.8)	0.011
Non-MSM	65 (33.5)	14 (56.0)	51 (30.2)	
Number of Sexual Partners (last 12 months) (n=194)				
None	77 (39.7)	12 (48.0)	65 (38.5)	0.010
One partner	61 (31.4)	12 (48.0)	49 (29.0)	
Multiple partners	56 (28.9)	1 (4.0)	55 (32.5)	
Condom Use (last 12 months) (n=117)				
Yes	97 (82.9)	9 (69.2)	88 (84.6)	*0.233
No	20 (17.1)	4 (30.8)	16 (15.4)	
Oral sex				
Yes	140 (72.2)	13 (52.0)	127 (75.1)	0.016
No	54 (27.8)	12 (48.0)	42 (24.9)	
Anal Sex				
Yes	113 (58.2)	8 (32.0)	105 (62.1)	0.004
No	81 (41.8)	17 (68.0)	64 (37.9)	
Role in Anal Sex (n=113)				
Receptive	99 (87.6)	6 (75.0)	93 (88.6)	*0.258
Non-Receptive	14 (12.4)	2 (25.0)	12 (11.4)	
Previous STDs (n= 194)				
HIV				
Yes	157 (80.9)	21 (84.0)	136 (80.5)	*1.000
No	32 (16.5)	4 (16.0)	28 (16.6)	
Unsure	5 (2.6)	0 (0.0)	5 (3.0)	
Syphilis				
Yes	58 (29.9)	2 (8.0)	56 (33.1)	0.031
No	95 (49.0)	15 (60.0)	80 (47.3)	
Unsure	41 (21.1)	8 (32.0)	33 (19.5)	
Genital Warts				
Yes	27 (13.9)	1 (4.0)	26 (15.4)	*0.322
No	110 (56.7)	15 (60.0)	95 (56.2)	
Unsure	57 (29.4)	9 (36.0)	48 (28.4)	
Gonorrhoea				
Yes	15 (7.7)	0 (0.0)	15 (8.9)	*0.365
No	118 (60.8)	16 (64.0)	102 (60.4)	
Unsure	61 (31.4)	9 (36.0)	52 (30.8)	
Chlamydia				
Yes	5 (2.6)	1 (4.0)	4 (2.4)	*0.752
No	125 (64.4)	16 (64.0)	109 (64.5)	
Unsure	64 (33.0)	8 (32.0)	56 (33.1)	
Herpes				
Yes	4 (2.1)	1 (4.0)	3 (1.8)	*0.571
No	128 (66.0)	16 (64.0)	112 (66.3)	
Unsure	62 (32.0)	8 (32.0)	54 (32.0)	

*Fisher Exact Test was used. p-value <0.05 was significant

Table 4: Multiple logistic regression analysis for factors associated with HPV vaccine acceptance

Variable	Crude OR (95% CI OR)	<i>p</i> -value	Adjusted OR (95% CI OR)	<i>p</i> -value
Oral sex				
Yes	0.36 (0.15; 0.85)	0.02	0.77 (0.25; 2.40)	0.65
No	(1)		(1)	
Numbers of sexual partners (last 12 months)				
1 partner	1.33 (0.55; 3.20)	0.53	1.08 (0.36; 3.29)	0.89
>1 partner	0.10 (0.01; 0.78)	0.03	0.13 (0.02; 1.07)	0.06
None	(1)		(1)	
Syphilis				
Yes	0.19 (0.04; 0.87)	0.03	0.27 (0.06; 1.28)	0.10
Unsure	1.30 (0.50; 3.34)	0.60	1.53 (0.56; 4.21)	0.40
No	(1)		(1)	
Anal sex				
Yes	0.29 (0.12; 0.70)	0.01	0.49 (0.12; 0.12)	0.32
No	(1)		(1)	
Marital status				
Single	0.32 (0.12; 0.82)	0.02	0.51 (0.14; 1.90)	0.32
Married	(1)		(1)	
Sexual orientation				
MSM	0.34 (0.14; 0.80)	0.01	1.47 (0.35; 6.06)	0.60
Non-MSM	(1)		(1)	

(1) Reference group. *p*-value <0.05 was significant

HPV and HPV vaccine as they would have been counselled about HPV and the vaccine as a part of their HIV and STD management. Currently only the modified syndromic approach protocol and the clinical practice guideline for sexually transmitted infections are being followed at these STD clinics. These documents provide the flow to investigate and manage patients with STDs. However, there is no standard protocol for counselling these high-risk patients upon diagnosis or follow up. Perhaps using a standard method of counselling and training doctors and health care workers along with regular Continuous Medical Education (CME) could improve the delivery of counselling and increase awareness of these patients towards HPV and the

vaccine.

The present study found that despite the lack of awareness of HPV vaccination, a large majority (87.1%) of high-risk men were willing to accept HPV vaccination once the information regarding HPV infection and vaccination was made available to them. This was almost similar to other countries such as Puerto Rico (76.9%), Ireland (78%), China (86.21%) and India (98%) (Colón-López et al. 2012; Sadlier et al. 2016; He et al. 2021; Belani et al. 2014). A previous study showed that men who received information regarding HPV and HPV vaccine benefits were more likely to accept HPV vaccination (Bonafide & Vanable 2015; Zhao et al 2021). This may be due to self-perceived risk and

the intention to protect themselves from this infection. Providing information regarding HPV infection and the benefits of vaccination by healthcare providers can increase awareness and vaccine uptake amongst high-risk men, as poor knowledge of HPV-related diseases is a key barrier in preventing them from getting vaccinated (Siu et al. 2019).

The present study did not demonstrate any correlation between HPV vaccine acceptance and marital status, sexual orientation, number of sexual partners, previous history of syphilis, practise of oral or anal sex. Most of these factors were attributed as high-risk behaviour; was defined as a set of sexual behaviour that predisposed one to acquire HIV or other STDs (Senn 2013). Although sexual behaviour may not be specifically related to HPV vaccine awareness, a few studies found that high-risk sexual behaviour was associated with increased HPV vaccination acceptance. Men with multiple sexual partners and a lifetime history of STD were noted to have higher intention for HPV vaccination (Zou et al. 2016; Jones & Cook 2008; Newman et al. 2013). Another study showed that men who practiced oral sex and perceived at risk of oral cancer were more receptive to HPV vaccination (Crosby et al. 2012). These findings showed that men with high-risk sexual behaviours were more inclined for HPV vaccination due to self-perceived risk.

The present study found that the most common (72%, n=18) reason for refusing the HPV vaccine was because these men thought that they did not

need the vaccine, suggesting a lack of self-perceived risk. This relationship is important as it signifies the need to improve health education, promotion and counselling regarding HPV-related illness among men; which would eventually help them to understand their risk of disease acquisition and subsequently encouraged them for the HPV vaccine. However, the uptake for the vaccine may be variable due to perceived social stigma. Many countries including Malaysia, do not legitimise MSM practice and therefore, health-promotive effort for this population is more challenging. Patients may be reluctant to reveal their sexual orientation, out of fear of being stigmatised by healthcare providers which in turn delays the risk stratification for HPV infection and subsequent delivery of HPV vaccine-related counselling.

The majority of our study participants identified that cost (68%) and vaccine side effects (49.5%) were the main barriers to HPV vaccine acceptance. Similarly, when our participants were asked about further information needed prior to HPV vaccination, majority identified that cost (51%) and vaccine side effects (77.3%) as the primary information required prior to receiving the vaccine. The present study findings were consistent with a previous study among HIV and STD men in India, where the vaccine's cost and side effects were identified as barriers to HPV vaccination (Belani et al. 2014). The present study was done during the COVID-19 pandemic, when misinformation and public distrust over vaccine safety were

pervasive (Lassi et al. 2021). Therefore, healthcare providers play an important role in relaying accurate information regarding the HPV vaccine to address patients' concerns; thus, helping them to make informed decisions. Although other countries have shifted towards a universal, government-funded HPV vaccination program, HPV vaccination for men in Malaysia is only available in private medical facilities at a high cost. HPV preventive effort will be less effective if it does not meet with an alternative strategy for vaccine funding.

One of the strengths of this study was that it was the first to assess HPV vaccine awareness, acceptance facilitators, and barriers to HPV vaccination among high-risk men in the local population. Participants who had not heard of HPV or the vaccine, received relevant information through the provided information by leaflet provided hence indirectly creating awareness among them. One of the limitations of this study was that sampling was done using a convenient method and a single group of men (high-risk) hence the findings are not generalisable to the population at large. Also, awareness of HPV and HPV vaccine was assessed using the single question "Have you heard about HPV?" and "Have you heard about HPV vaccine" which may have limited the accuracy of assessing awareness.

CONCLUSION

The present study shows low awareness of HPV and the vaccine among high-risk men. Although awareness was low, a good majority were willing

to accept HPV vaccination after receiving information regarding HPV and its prevention with the vaccine. Recommendations from doctors and government approval were the two most important facilitators while cost and side effects were the most common barriers to HPV vaccination. Targeting high-risk men for HPV vaccine counselling may improve awareness of this condition and promote vaccine uptake in effort to prevent HPV-related diseases among this vulnerable group.

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