

Male partner characteristics providing support for HPV vaccination of married women

Evli kadınların HPV aşısına destek sağlayan erkek partner özellikleri

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Özet

Amaç: Partnerlerine HPV aşısı olması konusunda destek veren erkeklerin özelliklerini değerlendirmek.

Gereç ve Yöntemler: Kadın hastalıkları polikliniğine başvuran tüm evli kadınlar (<26 yaş) ve eşleri çalışmaya katılım açısından değerlendirildi. Hastaların ve erkek partnerlerin tüm özellikleri kaydedildi. Tüm erkek katılımcılar, HPV ve HPV aşısı hakkında on ifade içeren bir anket formunu yanıtladı. Erkek katılımcılar, eşlerinin HPV aşısını desteklemelerine ve desteklemelerine göre iki gruba ayrıldı.

Bulgular: Toplamda 92 erkek partneri için HPV aşısını desteklerken, 144 erkek HPV aşısına karşı çıktı (destek oranı: %39). Ortalama evlilik yaşı, eğitim durumu ve aylık gelir eşlerine HPV aşısını destekleyen erkekler lehine anlamlı olarak yüksekti. Dindar olduğunu belirtenlerin oranı aşı karşıtı grupta anlamlı olarak daha yüksekti. Aşı ile ilgili güvenlik endişeleri (%27,8), aşının maliyeti (%26,4) ve HPV aşısının etkinliğine dair inanç (%26,4) HPV aşısına karşı çıkmamanın en yaygın nedenleriydi. Çok değişkenli regresyon analizinde evlilik yaşı ≥ 25 , lise ve üniversite eğitim düzeyi, aylık gelirin yüksek olması ve kendini dindar olarak tanımlamanın HPV aşısı destek oranını artırdığını ortaya koydu.

Sonuç: Bu çalışmada evlilik yaşı, eğitim düzeyi, aylık geliri ve HPV anketi puanı yüksek olan erkeklerin eşlerinin HPV aşısı olmalarını anlamlı olarak daha fazla destekledikleri bulunmuştur. Buna karşılık, kendilerini dindar olarak tanımlayan erkekler, eşlerinin aşı olmasını önemli ölçüde daha az desteklediler.

Anahtar Kelimeler: aşı, bağışıklık, genital siğil, human papilloma virüs, rahim ağzı kanseri

Abstract

Objective: To evaluate the characteristics of men who support their partners in getting the HPV vaccine.

Material And Methods: All married women (< 26 years) who were admitted to the gynecology outpatient clinic and their husbands were evaluated for participation in the study. Patients' and all characteristics of male partners were recorded. All male participants answered a survey form including ten statements about HPV and HPV vaccination. Male participants were divided into two groups according to their support or lack of support for HPV vaccination of their wife.

Results: In total, 92 men supported HPV vaccination for their partners and 144 men opposed HPV vaccination (support rate: 39%). The mean marriage age, education status and monthly income were significantly higher in favor of men who support HPV vaccination for their wives. The rate of those who stated they were religious was significantly higher in the anti-vaccine group. Safety concerns about vaccine (27.8%), cost of vaccine (26.4%) and belief about HPV vaccine effectiveness (26.4%) were most common reasons for opposing HPV vaccination. Multivariate regression analysis revealed marriage age ≥ 25 years, education level of high school and university, higher monthly income and not self-identification as religious increased the HPV vaccine support rate.

Conclusion: The present study found that men with higher marriage age, higher educational level, higher monthly income, and higher score on the HPV survey were significantly more supportive of their spouses getting the HPV vaccination. In contrast, men who identified themselves as religious had significantly less support for their wife being vaccinated.

Keywords: vaccine, immunity, genital wart, human papilloma virus, cervical cancer

The study was approved by Ethics Committee of University of Bezm-i Alem (Approval No: 2022/183, Date: 2021/10/21). All research was performed in accordance with relevant guidelines/regulations, and informed consent was obtained from all participants.

INTRODUCTION

Human papilloma virus (HPV) infection is the most frequently diagnosed sexually transmitted disease, and previous studies revealed that almost 75% of sexually active women encounter HPV during their lifespan (1). Although most HPV cases are asymptomatic, it is well-known that HPV may result in anal warts, anal dysplasia, oral and pharyngeal cancers, and gynecological malignancies (2). Vaccines were developed to prevent HPV complications, and the efficiency and safety of the quadrivalent HPV (HPV - 6, 11, 16, and 18) vaccine for prevention of cervical intraepithelial neoplasia, cervical cancer, vaginal and vulvar malignancies was proven by numerous studies (3). The Centers for Disease Control and Prevention (CDC) suggest routine HPV vaccination at the age of 11 or 12 years (also, vaccination can be done at age nine), and for all women up to age 26 years if not adequately vaccinated before (4).

Previous studies stated that HPV vaccination rates in women have not reached the desired level. Numerous reports investigated the possible factors affecting rejection of the HPV vaccination by women. Yeganeh and colleagues analyzed factors about accepting HPV vaccination in adolescents, and the authors stated that positive opinions about HPV vaccine safety, maternal pap-smear positivity, educational programs about HPV, and ethnicity affected vaccine acceptance (5). In a meta-analysis, which including three original articles, Santhanes et al. found vaccine cost, low knowledge about HPV infection and cervical cancer, and lack of positive recommendations by professional health care providers had negative impacts on HPV vaccine acceptance by women (6).

Previous studies analyzed the possible factors affecting HPV vaccination, but to our knowledge, there are not enough studies on the role of male partner characteristics on HPV vaccine acceptance in women, we aimed to clarify male partner characteristics providing support for HPV vaccination of women.

MATERIAL AND METHODS

The present study was conducted prospectively between January 2022 and July 2022. Informed consent was obtained from all women and their partners,

and the study was performed in accordance with Helsinki Universal Declaration of human rights. All married women who were admitted to the gynecology outpatient clinic and their husbands were evaluated for participation in the study. The cut-off age for women was 26 years for HPV vaccination according to the CDC; thus, women ≥ 26 years and their partners were not included in the study. Also, if any of the couples were diagnosed or treated for HPV infection and HPV-related cancer, they were excluded from the study. Other exclusion criteria were, presence of female and/or male sexual dysfunction, allergy to HPV vaccine, presence of immunodeficiency disorder(s), presence of pregnancy, belong to a religion other than Islam, and presence of active sexually transmitted infection and/or urinary infection.

All characteristics of male partners including age, presence of any chronic disease, age of first sexual intercourse, marriage age, education status, monthly income, and self-identification as religious were recorded. Also, opinions of male partners about HPV vaccination for their wives were noted (who supported vaccination and who opposed vaccination). Participants who were undecided about HPV vaccination were not given any guidance. Lastly, all male participants answered a survey form including ten statements about HPV and HPV vaccination accompanied by a doctor. These statements were 'HPV is a virus', 'HPV can be transmitted sexually', 'HPV vaccine is administered to treat the infected patient', 'HPV is associated with some types of cancer', 'HPV infects only men', 'antibiotics are used to treat HPV', 'HPV vaccine is a single dose vaccine', 'HPV can cause genital warts', 'HPV can be transmitted from mother to baby during pregnancy', and 'HPV can be transmitted by blood transfusion'. Participants got one point for each correct answer (range from zero to ten, worst to best).

Study Group

Male participants were divided into two groups according to their support or lack of support for HPV vaccination of their wife. Groups were compared according to women's age, male demographic characteristics and male knowledge about HPV and HPV vaccine. Multivariate analysis was done to identify male factors for opposing HPV vaccination for women.

Statistical Analysis

The Statistical Package for the Social Sciences version 22 (SPSS IBM Corp., Armonk, NY, USA) program was used for statistical analysis. Shapiro-Wilk test and Q-Q plots were done to identify normality of variable distribution. Independent Student t-test was used for normally distributed parameters. Quantitative variables are presented as mean \pm standard deviation. Categorical values were analyzed using the χ^2 test or Fisher's exact test. Multivariate analysis was done to identify male factors associated with supporting HPV vaccination of women. The data were evaluated at 95% confidence level and p value ≤ 0.05 was considered statistically significant.

RESULTS

In the study period, 236 men with mean age 28.3 ± 4.7 years were enrolled into the study. The mean age of women was 22.4 ± 3.5 years old. In total, 92 men supported HPV vaccination for their partners (support rate: 39%). Age of first sexual intercourse and marriage age were 22.0 ± 3.8 years and 23.9 ± 3.8 years, respectively. Only 20.8% of men finished university and 23.3% of participants finished high school. A total

of 98 (41.5%) men described themselves as religious. The mean points for the HPV survey was 5.1 ± 2.6 for the study population. Participant characteristics are summarized in Table 1.

No significant differences were found between the groups with regards to mean age, mean partner age, presence of chronic disease and age at first sexual intercourse, respectively (p= 0.125, p= 0.317, p= 0.914 and p= 0.315). However, mean marriage age was significantly higher in men supporting HPV vaccination (25.0 ± 3.6 years vs 23.2 ± 3.9 years, p= 0.001). Also, education status and monthly income were significantly higher in favor of men who support HPV vaccination for their wives (p= 0.004 and p= 0.007). Points on the HPV survey were 6.4 ± 2.0 for men who support vaccination and 4.3 ± 2.7 for men who oppose vaccination (p= 0.001). The rate of those who stated they were religious was significantly higher in the anti-vaccine group (30.4% vs 54.9%, p= 0.007). Safety concerns about vaccine (27.8%), cost of vaccine (26.4%) and belief about HPV vaccine effectiveness (26.4%) were most common reasons for opposing HPV vaccination (Table 2).

Table 1. Demographic characteristics of 236 men

	n:236
Age (years)*	28.3 ± 4.7
Age of partner (years)*	22.4 ± 3.5
Presence of chronic disease	53 (22.5%)
Age at first sexual intercourse*	22.0 ± 3.8
Marriage age	23.9 ± 3.8
Education status	
Illiterate or Elementary school	59 (25.0%)
Middle school	73 (30.9%)
High school	55 (23.3%)
University	49 (20.8%)
Monthly income	
Minimum wage	75 (31.8%)
2 x Minimum wage	76 (32.2%)
3 x Minimum wage	85 (36.0%)
Self-identification as religious	98 (41.5%)
Points on the HPV questionnaire	5.1 ± 2.6

HPV: Human papilloma virus

Table 2. Comparison of parameters between groups

	Accepted (n:92)	Rejected (n:144)	P value
Age (years)*	27.7±5.0	28.6±4.4	0.125
Age of partner (years)*	22.7±3.4	22.2±3.6	0.317
Presence of chronic disease	21 (22.8%)	32 (22.2%)	0.914
Age at first sexual intercourse*	21.7±3.9	22.2±3.7	0.315
Marriage age*	25.0±3.6	23.2±3.9	0.001
Education status			
Illiterate or Elementary school	15 (16.3%)	44 (30.6%)	0.004
Middle school	24 (26.1%)	49 (34.0%)	
High school	31 (33.7%)	24 (16.7%)	
University	22 (23.9%)	27 (18.7%)	
Monthly income			
Minimum wage	19 (20.6%)	56 (38.9%)	0.007
2 x Minimum wage	31 (33.7%)	45 (31.2%)	
3 x Minimum wage	42 (45.6%)	43 (29.9%)	
Self-identification as religious	28 (30.4%)	79 (54.9%)	0.007
Points on the HPV questionnaire*	6.4±2.0	4.3±2.7	0.001
Reason for not accepting the vaccine			
Not safe, side effects	-	40 (27.8%)	
Costly	-	38 (26.4%)	
No benefits	-	38 (26.4%)	
Religious reasons	-	14 (9.7%)	
Others	-	14 (9.7%)	

*mean ± standard deviation, HPV: Human papilloma virus

Table 3. Multivariate analysis of factors associated with men's support for HPV vaccination of their wife

	Univariate analysis	Multivariate analysis		
		Odds ratio	95% CI	P value
Marriage age (<25 or ≥25)	0.001	3.049	1.496-6.214	0.002
Education status				
Illiterate or Elementary school		Ref.	Ref.	Ref.
Middle school	0.004	1.380	0.532-3.584	0.508
High school		3.939	1.431-10.845	0.008
University		3.497	1.205-10.146	0.021
Monthly income				
Minimum wage		Ref.	Ref.	Ref.
2 x Minimum wage	0.007	2.837	1.120-7.185	0.028
3 x Minimum wage		4.188	1.663-10.548	0.002
Points on HPV questionnaire (<5 or ≥5)	0.001	8.361	3.793-18.427	0.001
Self-identification as religious (yes or no)	0.007	8.890	2.716-29.100	0.001

CI: Confidence interval

Supplement 1. Questions asked to measure men's knowledge about HPV and HPV vaccine

	n:236
HPV is a virus.	176 (74.6%)
HPV can be transmitted sexually.	144 (61.0%)
The HPV vaccine is administered to treat the infected patient.	112 (47.4%)
HPV is associated with some types of cancer.	102 (43.2%)
HPV infects only men.	98 (41.5%)
Antibiotics are used to treat HPV.	149 (63.1%)
HPV vaccine is a single dose vaccine.	155 (65.7%)
HPV can cause genital warts.	177 (75.0%)
HPV can be transmitted from mother to baby during pregnancy.	91 (38.6%)
HPV can be transmitted by blood transfusion	90 (38.1%)

* 1 point for each correct answer

Multivariate regression analysis revealed marriage age ≥ 25 years and education level of high school and university increased the HPV vaccine support rate 3.049 times, 3.939 times and 3.497 times, respectively ($p= 0.002$, $p= 0.008$ and $p= 0.021$). Also, higher monthly income was associated with higher HPV vaccine acceptance in comparison with minimum wage ($p= 0.028$ and $p= 0.002$). Self-identification as religious significantly decreased the support rate for vaccination ($p= 0.001$). Lastly, higher points on the HPV survey were significantly associated with supporting HPV vaccination ($p= 0.001$).

DISCUSSION

Factors affecting individual rejection of the HPV vaccine are still a hot topic in gynecology. Spouses support for each other is known to be critical in health-related matters. Thus, we investigated male opinions about HPV vaccination in women, and found that only 39% of men supported HPV vaccination for their wives. Also, we found that higher marriage age, higher educational level, higher monthly income, and higher score on the HPV survey were significantly associated with increased support for HPV vaccination of women. In contrast, being religious had a negative impact on men's support for HPV vaccination.

Previous reports emphasized the importance of knowledge about vaccines in acceptance of vaccine administration. Nickel and colleagues investigated

179 parents of daughters aged between 9 and 17 years and found significant correlation between higher knowledge about HPV vaccine and vaccine acceptance rate (7). In another study, Dursun et al. analyzed women's knowledge of HPV and HPV vaccination, and the authors found that 55% of participants had no knowledge about HPV and HPV vaccination. However, they stated that after intensive information, 70% of patients accepted HPV vaccination (8). Although people use many sources to have medical information, they may not reach enough information (9). In our study, almost half of men had no idea about HPV and HPV vaccination, and our study showed that society should be informed about HPV and HPV vaccines by professional health institutions. In addition, our results revealed that men who were more supportive of their spouses about the HPV vaccine had significantly higher knowledge level about HPV and HPV vaccine.

Educational level is crucial while understanding disease pathophysiology and prevention. Rosenthal and colleagues analyzed factors affecting HPV vaccine acceptance in adolescents and found that parents with university education level had a higher HPV vaccine acceptance rate than parents with high school education level (10). In another study, Constantine et al. investigated the HPV vaccine acceptance of 552 individuals, and the authors found higher HPV vaccine acceptance rates in individuals with higher education level (11). For the first time, we analyzed

the impact of men's educational level on support for HPV vaccination of women. Men with high school and university education level were more supportive about their wives receiving the HPV vaccine. In addition, there was a positive correlation between higher monthly income and HPV vaccine support. In our country, the government does not pay for HPV vaccination, and patients receive the HPV vaccine at their own expense. This may explain why low-income men are opposed to their spouses getting vaccinated.

To our knowledge, no study has evaluated the impact of marriage age on HPV vaccine acceptance. However, some studies investigated the role of age on HPV vaccine acceptance. Jones and Cook investigated 138 men and 202 women, and the authors found that individuals aged 18–19 years were 5.4 times more likely to accept the HPV vaccine than individuals aged 22–32 years (12). In another study, Jaspers et al. stated that an increase in age by one year was associated with a decrease in vaccine acceptance by 6.6% (13). In contrast, higher marriage age in men was associated with higher support for vaccination in our study. We believe that gaining self-confidence, economic independence and freedom from family pressure after marriage in developing countries may have led to this result.

Even though the present study is the first to investigate the impact of male characteristics on HPV vaccination support for women, our study has some limitations. First of all, the present study was a survey study, and participant answers could be affected by many internal and external factors. To prevent this, all participants answered questions in a quiet room without time constraints. Also, in case of any disruption, the participant was supported by a professional health worker. Secondly, the study evaluated a certain period and administered in a single centre. Individual opinions could change over time. Lastly, the present study identified only barriers affecting men's support of HPV vaccination; finding solutions to these problems may be the subject of future studies.

CONCLUSION

Our study demonstrated that only two out of five men supported their wife receiving HPV vaccination.

Moreover, the present study found that men with higher marriage age, higher educational level, higher monthly income, and higher score on the HPV survey were significantly more supportive of their spouses getting the HPV vaccination. In contrast, men who identified themselves as religious had significantly less support for their wife being vaccinated. We believe that our study findings could be used in studies to increase the acceptance of the HPV vaccine.

Conflict of Interest

The authors declare to have no conflicts of interest.

Financial Disclosure

The authors declared that this study has received no financial support.

Informed Consent

Informed consent was obtained from all individual participants included in the study.

Ethical Approval

The study was approved by Bezm-i Alem University Ethics Committee (Approval Number: 2021/183, Date: 2021/10/21) and written informed consent was received from all participants. The study protocol conformed to the ethical guidelines of the Helsinki Declaration.

Author Contributions

Conception and design; Ergül A, Data acquisition; Ergül A, Data analysis and interpretation; Çağlar U, Drafting the manuscript; Ergül A, Çağlar U, Critical revision of the manuscript for scientific and factual content; Ergül A, Çağlar U, Statistical analysis; Çağlar U, Supervision; Ergül A.

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