

Factors Influencing College Students' HPV Vaccination Intention: Focusing on Gender Differences and The Role of Subjective Norms

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Abstract

This study intends to examine gender differences in predictors of Human Papilloma Virus (HPV) vaccination intention based on the Theory of Planned Behavior (TPB). Specifically, this study investigated whether the variables constituting TPB might show differential effects on college men and women's HPV vaccination intention. The current study also examined which specific subjective norms are more influential in explaining HPV vaccination intention of men and women. The results of an online survey revealed that females showed significantly higher intention to get the HPV vaccine and perceived behavioral control than male students. Female students' vaccination intention was best predicted by perceived behavioral control whereas friend norm was the most influential predictor of male students' intention to get the HPV vaccine. The results of this study provide implications for persuasive strategies required to appeal to college men and women to increase HPV vaccination rate.

Keywords: HPV Vaccination Intention, Theory of Planned Behavior, Gender Differences, Subjective Norm, College Students

1. INTRODUCTION

Human Papilloma Virus (HPV) is sexually transmitted infection that can cause genital warts and various cancers: anal and oropharyngeal cancers in both women and men, cervical, vagina, and vulva cancers in women, and penile cancer in men [1]. To prevent HPV infection and HPV-related disease and cancers, Center for Disease Control and Prevention (CDC) recommends that both males and females between 11 and 26 years old get the HPV vaccine [1]. In Korea, in June 2016, HPV vaccination was designated as a national vaccination and girls aged 12 years can receive the HPV vaccine free of charge [2]. In 2022, the target of HPV vaccination cost support has been expanded to female adolescents aged 13-17 years and low-income groups aged 18-26 years old [3]. However, males are still excluded from HPV vaccination cost support. Also, most college-aged women are not a target of free HPV vaccination. College students are at high risk of HPV infection because of increased risky sexual behaviors such as unprotected sexual intercourse, but their vaccination rate is found to be pretty low [4, 5]. Low vaccination rate puts college students at greater risk of HPV infection.

When both men and women are vaccinated, the rate of HPV infection and the incidence of HPV related

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diseases may be reduced more than when only women are vaccinated [6]. However, in Korea, the Ministry of Health and Welfare ran campaigns to increase HPV vaccination mainly targeting mothers and daughters, female adolescents, and women in their twenties [2, 7]. Recently, Merck Sharp & Dohme Corp. (MSD) Korea, the manufacturer of Gardasil (one of the HPV vaccines), has released a series of campaigns to encourage men and women to be vaccinated together, using men as their advertising models [8, 9]. Likewise, a majority of previous studies regarding HPV vaccination mainly focused on examining factors influencing HPV vaccination of women [e.g., 10-12]. Recently, a few scholars began to investigate males' beliefs and attitudes regarding HPV vaccination intentions [e.g., 13-15]. In other words, both health professionals and scholars are increasingly making efforts to find strategies to increase HPV vaccination rate for both men and women.

To promote HPV vaccination rate of both male and female college students, more research is needed to clarify differences between men and women in HPV vaccine-related beliefs, attitudes, and intentions. Thus, this study intends to examine predictors of HPV vaccination intention focusing on gender differences. By examining gender differences in predictors of HPV vaccination intention, this study will provide implications for persuasive strategies required to appeal to college men and women to increase HPV vaccination rate.

2. LITERATURE REVIEW

Theory of Planned Behavior (TPB) is a theoretical framework that explains health related behaviors. TPB posits that one's behavioral intention is predicted by attitudes toward the behavior, subjective norms, and perceived behavioral control [16]. Attitudes refer to ones' evaluation of the behavior. Subjective norms refer to one's perception about important others' approval of the behavior. Perceived behavioral control is defined as one's belief that one has control over the behavior. TPB was commonly applied in HPV related studies to examine factors influencing HPV vaccination intentions [e.g., 13, 15, 17]. For example, perceived behavioral control and subjective norm were positive predictors of HPV vaccination intentions of female college students [17], while attitude toward the behavior and subjective norm were positive predictors of HPV vaccination intentions of college men [15]. In these studies, subjective norms were measured with items measuring global subjective norms (e.g. "Most people who are important to me think that I should get the HPV vaccine"). Some scholars have suggested the need to specify subjective norms to reflect characteristics of the behavior and various types of social pressure [18, 19]. Following their suggestions, the present study proposes to specify subjective norms regarding HPV vaccination into friend, parent, family other than parent, and lover norms.

Stout and his colleagues found that perceiving greater support from parents, doctor, and peers regarding HPV vaccination is positively related to HPV vaccination intention respectively, and parent and friend norms showed higher beta coefficients than doctor norms [14]. However, female and male students were put into one group and the results did not reflect gender difference in the study. Some studies found that there were differences between men and women in HPV vaccine-related beliefs, attitudes, and intentions [e.g., 20-22]. For example, male students showed less intention and less perceived needs to get the HPV vaccine than female students [20, 23]. Female students perceived more benefits of HPV vaccination (Gardasil) in preventing cervical cancer than male students [21]. Friends' recommendation was more influential for males than females regarding HPV vaccination decision making [21]. However, variables related to TPB, such as subjective norm and perceived behavioral control, were not directly compared between men and women in previous studies. Thus, this study intends to examine gender differences in predictors of HPV vaccination intention. The present study will investigate whether the variables constituting TPB may show differential effects on college men and women's HPV vaccination intention. The current study will examine which specific subjective norms are more influential in explaining HPV vaccination intention of men and women.

Based on the above discussion, the following research questions are presented.

- RQ1. What are the differences in the levels of attitudes, subjective norms, perceived behavioral control, and HPV vaccination intention between college men and women?
- RQ2. What are the differences in predictors of HPV vaccination intention between college men and women?
- RQ3. Which subject norm exerts a greater influence on college men and women's HPV vaccination intention?

3. METHOD

A convenience sample of 125 college students from two universities in Korea participated in an online survey. At the beginning of the survey questionnaire, participants were asked about their vaccination status, that is whether and how many times they got the HPV vaccine. Excluding data from 25 students who were fully vaccinated against HPV, 100 responses were used for statistical analyses. Respondents' age ranged from 18 to 28 ($M=21.64$, $SD=2.09$). The number of female respondents was 65. The mean score for health status was 4.71 ($SD=1.27$, 7-point scale: 1=very poor, 7=excellent), indicating that respondents perceived themselves in overall good health.

The measurement items for each variable were adopted from other studies [15, 24] and modified to be applicable to the current study. Variables related to TPB included subjective norm, attitude toward behavior, and perceived behavioral control. *Subjective norm* was measured with four 7-point scale items from 1 (strongly disagree) to 7 (strongly agree) [15]. Four specific subjective norms were measured: parents, family other than parents (e.g., sibling, relative), friends, and present or future lovers. A sample statement was "My parents would think that I should get the HPV vaccine." *Attitude* was measured with seven semantic differential scale items [15, 24]. A stem statement ("I think getting the HPV vaccine would be ...") and a set of bipolar adjectives were used to measure attitude: bad–good, not protective–protective, unnecessary–necessary, unhealthy–healthy, disadvantageous–advantageous, painful–painless, and harmful–beneficial. *Perceived behavioral control* was measured with four 7-point scale items (1=strongly disagree, 7=strongly agree) [15]. A sample statement included "If I wanted to, I am sure I could get the HPV vaccine in the next 1 year." A dependent variable, *vaccination intention*, was measured with three 7-point scale items from 1 (strongly disagree) to 7 (strongly agree) [15]. A sample statement included "I plan to get the HPV vaccine in the next 1 year." Reliability of the measurement items were tested with Cronbach's α . Cronbach's α values for each variable exceeded 0.7 (attitude: $\alpha=.915$, Perceived behavioral control: $\alpha=0.881$, vaccination intention: $\alpha=.949$).

4. RESULTS

Analysis of covariance (ANCOVA) was performed to compare levels of variables between male and female groups (RQ1). Age and health status were entered as covariates. As shown in Table 1, female respondents showed higher parent norm, family norm, and friend norm than male respondents. In other words, female respondents were more likely to think their parents, family, and friends would think that they should get the HPV vaccine. Also, female respondents reported higher perceived behavioral control and vaccination intention than male students.

Hierarchical regression analyses were performed to examine differences in predictors of vaccination intention (RQ2) and differential impact of specific subjective norms (RQ3). Age and health status were entered in the first box as control variables. Variables related to TPB (i.e., subjective norm, attitude toward behavior, perceived behavioral control) were entered in the second box. As shown in Table 2, age and health status were not statistically significant predictors of vaccination intention in both male and female groups. For male students, only friends ($\beta=0.625$, $t=2.457$, $p=0.021$) had statistically significant positive influence on vaccination intention. For female students, parents ($\beta=0.464$, $t=2.190$, $p=0.033$), family ($\beta=-0.480$, $t=-2.232$,

$p=0.030$), and perceived behavioral control ($\beta=0.546$, $t=4.867$, $p=0.000$) were found to be predictors of vaccination intention. For male respondents, variables related to the theory of planned behavior explained 50.4% of the variance in the dependent variable ($\Delta R^2=0.504$, $\Delta F=4.626$, $p=0.006$). For female respondents, variables related to the theory of planned behavior explained 49.8% of the variance in the dependent variable ($\Delta R^2=0.498$, $\Delta F=9.310$, $p=0.000$).

Table 1. ANCOVA results

Variables	Male		Female		F
	M	SD	M	SD	
SN: parents	3.629	1.816	4.954	1.634	11.298**
SN: family	3.543	1.738	4.723	1.606	11.013**
SN: friends	3.629	1.848	5.123	1.474	17.256***
SN: lover	4.914	1.597	5.277	1.317	1.666
Attitude	5.453	1.126	5.763	1.111	.429
PBC	4.164	1.716	4.862	1.241	14.024***
Vaccination intention	3.000	0.318	4.518	0.227	13.995***

Note. * $p<0.05$, ** $p<0.01$, *** $p<0.001$, SN= subjective norm; PBC= perceived behavioral control

Table 2. Hierarchical regression results (DV: Vaccination intention)

Predictors	Male		Female	
	Model1 β	Model2 β	Model1 β	Model2 β
Control variables				
Age	-0.121	-0.079	0.054	-0.083
Health status	0.128	-0.008	-0.003	-0.034
TPB				
SN: parents		0.366		0.464*
SN: family		-0.452		-0.480*
SN: friends		0.625*		0.268
SN: lover		-0.008		0.040
Attitude		0.150		0.058
PBC		0.151		0.546***
ΔR^2	0.024	0.504**	0.003	0.498***
Total R^2	0.024	0.528**	0.003	0.501***
Total R^2 (adjusted)	-0.037	0.383**	-0.029	0.430***

Note. * $p<0.05$, ** $p<0.01$, *** $p<0.001$, DV= dependent variable, TPB= theory of planned behavior; SN= subjective norm; PBC= perceived behavioral control

5. DISCUSSION

This study examined gender differences in predictors of HPV vaccination intention based on TPB. The results of an online survey revealed that females showed significantly higher intention to get HPV vaccine than male students, similar to the results of previous studies that compared men and women's HPV vaccination

intention [20, 23]. Also, female students felt more social pressure to get the HPV vaccine than male students. Female students were more likely to perceive that their parents, family and friends think that they should get the HPV vaccine. Also, female students showed higher perceived behavioral control than male students, indicating that females felt more confident about getting HPV vaccination.

Regarding predictors of HPV vaccination intention, female students' vaccination intention was best predicted by perceived behavioral control, consistent with previous findings [24]. This result emphasizes the importance of increasing perceived behavioral control to boost HPV vaccination among women. Friend norms was the most influential predictor of male students' intention to get HPV vaccine. In addition, while parent norm positively influenced female students' vaccination intention, friend norm positively influenced male students' vaccination intention. In other words, peer's opinion about HPV vaccination has impact on decisions regarding male students' HPV vaccination. This is in line with previous study that found peers' approval was important in males' HPV vaccine related decision-making process [21]. Perceived behavioral control was not a significant predictor of college male students' intention to get the HPV vaccine, consistent with a previous study [15].

This study was meaningful in that it showed differential impact of variables constituting TPB, especially specific subjective norms in explaining men and women's HPV vaccination intention. Friend norm was more influential for college men's vaccination intention whereas parent norm was more influential for college women's vaccination intention. The findings of this study emphasize the need to appeal to men and women differently regarding HPV vaccination. In recent HPV vaccination-related campaigns, the target was extended to male students and lover's normative influence was implied in the ads (e.g., [8], it is good to vaccinate together for each other). Rather than emphasizing what a lover thinks regarding the HPV vaccine in the advertisement, showing peer support and approval of HPV vaccination would be more influential for male students. For instance, after a scene in which a male actor received the HPV vaccine was shown in a drama, search keywords related to male's HPV vaccination were listed in the top keywords on main portal sites [25]. This case provides an example of peer's normative influence on males' HPV vaccination. For female students, providing educational information for both parents and daughters regarding the HPV vaccine could be still an important persuasive strategy. In addition, various ways to increase perceived behavioral control should be considered in developing message for HPV vaccination of female students. For example, to increase women's confidence in getting the HPV vaccine, actionable and specific information such as where to and how to receive the vaccine and step-by-step guide to get the vaccine should be provided readily to women through credible sources.

Because of convenience sample and a rather small sample size used in the current study, the findings of this study are not generalizable to a larger student population. Future research should conduct a national level survey that examines gender differences in factors influencing HPV vaccination to expand the findings of this study. Also, this study examined specific subjective norms such as parents, friends, and lovers. However, there are other types of social norms such as descriptive norms and injunctive norms that might influence one's HPV vaccination intention [19]. Future research could examine the influence of various types of social norms among men and women to provide more specific norm-related insights into creating messages for promotion of HPV vaccination.

6. CONCLUSION

College students are at high risk of HPV infection because of increased risky sexual behaviors and low rate of HPV vaccination. In order to boost college students' HPV vaccination rate, this study examined gender differences in factors influencing intention to get the HPV vaccine based on TPB. This study found differential impact of specific subjective norms on HPV vaccination intention of men and women. The findings of this

study showed that friend norm had more impact on college men's vaccination intention whereas perceived behavioral control and parent norm had more impact on college women's vaccination intention. Based on the results of this study, we suggest that, in planning of promotional campaigns for HPV vaccination, different persuasive strategies should be developed to appeal to college men and women respectively. For male students, it would be more appealing to show peer support and approval for HPV vaccination in campaigns promoting HPV vaccination. For female students, devising various ways to boost women's confidence in getting the HPV vaccine would be crucial in planning promotional messages for them.

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