

The Media Influence on Men's and Women's Willingness to Vaccinate against HPV - A study based on the Theory of Planned Behavior

Shuyue Tang^{1, +}, Zitong Wang^{2, +} and Siyu Zhang^{3, *, +}

¹School of Drama and Performing Arts, Sichuan University of Media and Communications, Sichuan, China

²School of Journalism, Xi'an International Studies University, Xian, China

³School of Sport Journalism and Media, Xi'an Physical Education University, Xian, China

*Corresponding Author: webmaster@xaip.edu.cn

+There authors contributed equally.

Abstract. According to previous studies, HPV vaccination is very effective in protecting against the HPV virus. The media attention to the HPV vaccine has increased greatly in recent years, and people's attitudes and behaviors toward HPV vaccination have changed significantly. This study was based on TPB theory and used a questionnaire survey to understand the influence of media communication on audience attitudes and behaviors toward HPV vaccination and the differences between men and women. The analysis of the data results showed that there was a positive correlation between media attention to HPV and audience vaccination with HPV, and its effect on women was slightly less significant than that of men. This discrepancy is due to the different attention paid by the media to HPV vaccination for men and women, and also due to the fact that the impact of this virus on women is much greater than that of men in the perception of the audience, which is also largely due to media information. Overall, the authors suggest all the audiences should pay more attention to these HPV viruses in order to protect their health.

Keywords: Media, HPV, Gender Difference.

1. Introduction

In 2020, the world has about 604,000 new cases of cervical cancer and about 342,000 deaths. Of these, China has about 110,000 new cases of cervical cancer and about 59,000 deaths. In the same year, cervical cancer rates plummeted among women vaccinated against human papillomavirus (HPV) in England. In 2021, a study published in The Lancet Infection Disease found that after an HPV vaccination program was introduced in schools, men were 52 to 76 percent less likely to be infected with HPV.

With that background, there have been previous studies on the factors that contribute to HPV vaccination intentions, but there has been a lack of research on the media. This study fills a gap in the study of the influence of media on HPV vaccination intentions of men and women using the theory of planned behavior (TPB). The purpose of this study was to investigate the relationship between the media and the intention of the HPV vaccination in men and women based on the theory of planned behavior. In specific, the research targets the public's attitude towards the HPV vaccine, the public's subjective norms towards the HPV vaccine, the public's perceived behavioral control of HPV vaccine and the actual vaccination behavior of the HPV vaccine.

Previous studies have explored factors influencing public vaccination of the HPV vaccine, such as concerns about the side effects of the HPV vaccine, confidence in vaccine effectiveness, cost of HPV vaccine, etc. [1]. Most existing studies fail to target the effect of media on the willingness of the population to vaccinate against the HPV, and do not differentiate the factors that influence the willingness of men and women to vaccinate against HPV. Therefore, this study contributes to the relatively scarce research in this field. The practical significance of this study is to find out what factors will affect people's attitude toward HPV vaccination and to support the implementation of

some targeted intervention policies to improve people's positive attitudes toward HPV vaccination. Secondly, by creating subjective norms of behavior, the public's cognition of the HPV vaccine should be affected. In addition, increasing people's perceived behavioral control and making HPV vaccination more accessible to the public, such as reducing the price, can be effective to let more people to inoculate the HPV vaccine. Based on the theory of planned behavior and through the questionnaire sample information, this study studied how to improve the public's attitude, subjective norms and direct behavioral control of HPV vaccine vaccination, so as to strengthen the public's willingness to vaccinate HPV vaccine and increase the possibility of actual vaccination of HPV vaccine.

2. Literature Review

Many scholars use the Theory of Planned Behavior to discuss the aspect of inoculating HPV vaccine. Some other scholars also investigate the mothers' intentions of vaccinating children against HPV [2]. It seems that men's intention of having HPV vaccine is less than women's. Why did this phenomenon happen? Someone discussed the factors: The central barriers against vaccination of boys and men are: (1) lack of knowledge about HPV vaccine, (2) vaccine hesitancy, (3) lack of recommendations and advice from relevant medical personnel, (4) cost of vaccine and logistics, and (5) because of the security of HPV vaccine, the idea will increase that HPV vaccination may promote promiscuity instead of the effect of preventing promiscuity [3]. This research uses the Theory of Planned Behavior to explore the influence of media on people's intention of inoculating HPV vaccine. The Theory of Planned Behavior was proposed by Icek Ajzen in 1991. Broadly speaking, empirical evidence supported this theory well. These different kinds of intentions can be predicted by attitudes which towards to the behavior, subject norms and perceived behavior control. We can know the considerable discrepancies in actual behavior from perceptions of behavior control and these intentions [4]. This study will discuss the influence of media on inoculating HPV vaccine, especially will focus on the influence of media on men's intention of inoculating HPV vaccine. As previous studies did not discuss the influence of media on inoculating HPV vaccine, so the authors of this study hope to use the Theory of Planned Behavior to forecast how much influence media have on inoculating the HPV vaccine.

With the support of the TPB theory, the authors of this study suggest the following hypotheses:

H1: People will change their inherent attitude toward inoculating HPV vaccine under the influence of media.

H2: After browsing the public opinions on the internet, people will be more willing to inoculate HPV vaccine.

H3: Men are more likely to inoculate HPV vaccine under the influence of media.

H4: Men are less likely to inoculate HPV vaccine under the influence of media.

3. Method

3.1. Data Collection

In this study, the questionnaire method was used, and random sampling was conducted by questionnaire star software to distribute questionnaires. A total of 574 valid samples were obtained. This questionnaire aims to obtain the respondents' attitudes and behaviors toward HPV vaccination and access to related information through the basis of the TPB model, and to study the influence of media coverage on the behavior of HPV vaccination.

3.2. Samples

Of the 574 respondents, 86.03% were female and 13.97% were male. The age range ranged from 9 to 45 years +, with 37.71% aged 20-29 years and 29.63% aged 30-39 years, the mean age is about 20. The median monthly household income was \$429. Participants with no religion were accounted

for 90.07%, Christianity accounted for 4.21%, Islam accounted for 3.54%, and Buddhism accounted for 2.02%.

3.3. Basic Variable

3.3.1 Base variables

Demographic variables typically included age, gender, monthly household income, and religion [5]. All these factors were used as the basic variables in this study.

3.3.2 Independent variables

3.3.2.1 Attention to media information about HPV vaccine

To evaluate individuals' attention to media information about the HPV vaccine, the authors used test items from a previous study where respondents followed HPV-related information in four media channels: newspapers (both print and digital), television, the Internet, and social media [6]. Cronbach coefficient of Media Exposure is believable.

3.3.2.2 Attitudes toward HPV vaccine

To measure attitudes towards the HPV vaccine, three items were taken from a previous study where respondents were asked to describe their personal attitudes towards the HPV vaccine through the measurement criteria of a Likert scale [7]. The percentage of "strongly agree" and "agree" reflects the percentage of respondents with positive attitudes toward the HPV vaccine. Comparing the attitudes of men and women separately, some differences can be seen. Women clearly have a more positive attitude toward HPV vaccine than men. The Cronbach's coefficient of this scale is 0.783.

3.3.2.3 Subjective behavioral norms

Subjective behavioral norms were measured from a study by Parker and Smith where respondents were subjected to social norms from family and friends, and media messages, which also had come to have some influence on their intentions regarding HPV vaccination behavior [8]. One of the items specifically distinguished the subjective behavioral norms of HPV vaccination among men, and the positive attitude of the item was 55.05%, compared to 62.46% for HPV vaccination, indicating that there are still differences in the subjective norms for HPV vaccination between men and women under the influence of media messages. The Cronbach's coefficient for this scale is 0.766.

3.3.2.4 Perceptual Behavioral Control

The three items used to measure perceptual behavioral control were obtained from a study by Snyder and Rouse [9]. In the Likert scale, respondents expressed different attitudes agreeing with the following behavioral statements: a. I am confident to get the HPV vaccine even if it is expensive [literature] b. I am confident to get the HPV vaccine even if the media reports that it has some side effects c. I will get the HPV vaccine after reading the publicity about its effectiveness. The Cronbach's coefficient for this scale is 0.769.

3.3.3 Dependent variables

3.3.3.1 Behavioral intention to receive HPV vaccine

Two items from previous studies were used to measure the behavioral intention of individuals to receive the HPV vaccine [10,11]. Respondents reported their level of agreement with the following statements of intention in the next six months on a Likert scale: a. Likelihood of receiving HPV vaccine b. Likelihood of convincing others to receive HPV vaccine. The Cronbach coefficient for this scale is 0.749.

4. Results

Table 1. Correlation

		Attitude	Subject Norm	Perceived Behavior Control	Media Exposure
Intention	Pearson Correlation	.637**	.628**	.649**	.531**
	Significance(two-tailed)	0.000	0.000	0.000	0.000
	Number	574	574	574	574

After analysis (see Table 1), the reliability and validity of this questionnaire is of reference significance. After further analysis we can find that subject norm, perceived behavior control and media exposure are all have strong significance and all are positively related to intention. Pearson Correlation finds that there is strong correlation($0.6 < r < 0.8$) between these three variables (attitude, subject norm, perceived control) and intention. There is a moderate correlation ($0.4 < r < 0.6$) between media exposure and intention. The result means that people's attitude subject norm and perceived behavior control toward inoculating the HPV vaccine can decide whether people inoculating the HPV vaccine or not. Media exposure can also decide the final decision of inoculating the HPV vaccine which explained that media can also influence people's intention of inoculating the HPV vaccine.

Table 2. Correlation of male

		Attitude	Subject Norm	Perceived Behavior Control
Intention(Male)	Pearson Correlation	0.507	0.407	0.558
	Significance(one-tailed)	0.000	0.000	0.000
	R-squared	0.413	Significance	<.001 ^b
	Number	81	81	81

Separating man and woman to two parts to study the problem, it can be found that these three variables are still have strong relations to respondents' intention of inoculating HPV vaccine. Attitude is found to be the strongest influencer for female's HPV inoculation intention (Table 3) and perceived behavior control is founded to be strongest influencer for male's intention (Table 2). It can be speculated that under the influence of media which propaganda the news of inoculating HPV vaccine, men will be affected more because they are more likely to perceive the difficulty of vaccination through external reports.

Table 3. Correlation of female

		Attitude	Subject Norm	Perceived Behavior Control
Intention(Female)	Pearson Correlation	0.612	0.543	0.595
	Significance(one-tailed)	0.000	0.000	0.000
	R-squared	0.427	Significance	<.001 ^b
	Number	493	493	493

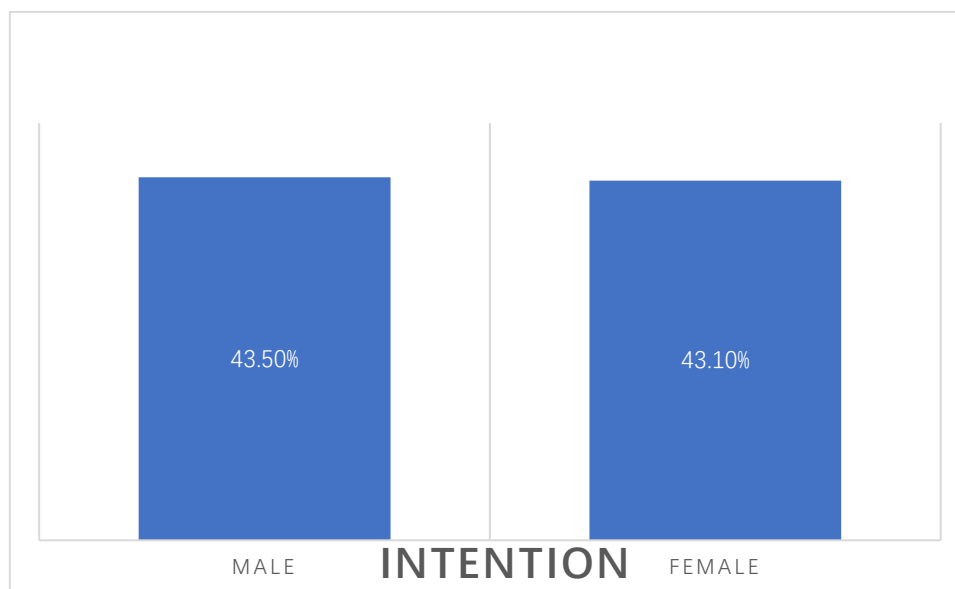


Figure 1. Intention Percentage

After screening the respondents who choose to agree and strongly agree in the 13 questions (You will inoculate HPV vaccine after you browse the valid propaganda of inoculate HPV.), the authors calculated the percentage of men and women. Media will influence female and male to inoculate the HPV vaccine and the possibility of the two sides are very close. However, the results finally shows that male will be more likely to inoculate the HPV vaccine than female under the influence of media.

5. Discussion

According to the data analysis results, this research shows great reliability and validity for reference. There is also a correlation between these four variables (attitude, subject norm, perceived control, media) and intention and all these factors are positively correlated which explain that the media will guide people to inoculate the HPV vaccine. Linear regressions shows that the correlation of influence of media on inoculating HPV vaccine is significant. Therefore, under the publicity of the media people's intention of inoculating HPV vaccine will rise. 349 respondents selected agree and strongly agree in the 13 questions (You will inoculate HPV vaccine after you brose the valid propaganda of inoculating HPV.) so hypothesis 1 and hypothesis 2 were evidenced. According to linear regressions, 43.5% of men will inoculate HPV vaccine under the influence of media and 43.1% of women will inoculate HPV vaccine under the influence of media. It proved that men are more probably inoculate HPV vaccine under the influence of media. So, hypothesis 3 is testified and hypothesis 4 is not tenable.

Hypothesis is consistent with the final results. People's intention of having the HPV vaccine under the influence of media have positive correlations with these three variables. The results illustrate the information that media express will definitely influence the intention of people inoculate the HPV vaccine, especially for men. Maybe men know less about the HPV vaccine so media always carry out positive publicity to let men know more about the HPV vaccine so that the illness could be defended. Another reason is men may have less knowledge of the HPV vaccine before and have no consciousness about inoculating the HPV vaccine, so when they know they can inoculate it they will do it. Women generally know more about the HPV vaccine because media always propagate women to inoculate it but women will know more about the negative effect and consider more about inoculation. Men is more likely to inoculate the HPV vaccine under the influence of media than women. With results presented in this study, further study could focus on the factors that influence women to inoculate the HPV vaccine in detail.

According to the positive correlation of the results, the authors suggest media publishers to increase the positive publicity, especially on the aspect of men. Several reviews have identified HPV

prevalence in men as high as 72.9% and usually $\geq 20\%$; HPV prevalence in women in one systematic review was 14%–90% [12]. It is hoped that the information of encouraging men to inoculate HPV vaccine will be increased so that men's intention will be raised, and relevant illness will be decreased. If everyone pays more attention to the illness, the illness will be reduced radically.

In addition, the research has some limitations. The hypotheses are not comprehensive enough because questions of the questionnaire may not be meticulous. Further improvement should be generated to increase the overall reliability of the research.

6. Conclusion

Based on the Theory of Planned Behavior, this study expanded the relationship between the communication media and the intention of men and women to vaccinate against HPV. Questionnaire survey was conducted to investigate the correlation between the public's attitude towards HPV vaccine, the public's subjective norms towards the HPV vaccine, the public's perceived behavioral control of HPV vaccine and the actual vaccination behavior of the HPV vaccine. This study hopes that future studies can take this as a basis to further understand how the public's attitude towards HPV vaccine, the public's subjective norms towards the HPV vaccine, and the public's perceived behavioral control of the HPV vaccine will lead to actual HPV vaccination behavior. These results have implications for both society (e.g., HPV vaccine resources) and individuals (e.g., the willingness of the general population to vaccinate against HPV) and will therefore trigger further research in this area, which has significant implications for the development of the HPV vaccine industry and public health. The results show that the effect of the medium on people's willingness to vaccinate against HPV is significant, especially for men. Based on the results, the study hopes that the media can increase the positive publicity for the HPV vaccine.

The significance of this study is mainly practical. Most of the existing studies investigated the public's willingness to vaccinate HPV vaccine from an empirical perspective, while the research from a theoretical perspective is relatively limited. Therefore, the results of this study from the three aspects of the public's attitude, subjective norms and perceived behavioral control of the HPV vaccine show that the theory of planned behavior is a promising theoretical framework for the study of the public's intention to vaccinate the HPV vaccine. Limited studies have explored the factors that influence public vaccination of HPV vaccines, such as concerns about side effects of the HPV vaccines, confidence in the effectiveness of the vaccine, the cost of the HPV vaccines, and so on. [1] Most existing studies lack the effect of media on the willingness of the population to vaccinate against HPV, and do not differentiate the factors that influence the willingness of men and women to vaccinate against HPV. Therefore, this study contributes to the relatively scarce research in this field. In addition, the practical significance of this study is as follows: First, according to the data of this study, the public has a vague attitude towards male HPV vaccination, with nearly half of the samples holding a negative attitude towards male HPV vaccination. Therefore, some targeted intervention policies should be implemented to improve the public's positive attitude towards male HPV vaccination [13]. The second is a lack of public access to information about HPV vaccination, especially for men. In addition, previous studies found that subjective norms were identified as the most influential factors related to men's intention to receive the HPV vaccine. Therefore, subjective norms of behavior through media channels can be created to increase the willingness of the public, especially men, to get the HPV vaccine. Thirdly, the data revealed that the high price and side effects of the HPV vaccine greatly affected the public's willingness to vaccinate HPV vaccine. It will be easier for the public to vaccinate HPV vaccine if the public's perceived behavioral control is improved. For example, reducing the price of the HPV vaccine and enhancing public awareness of the effects and side effects of the HPV vaccine may make more people willing to be vaccinated.

References

- [1] Diviya Santhanes, Che Pui Yong, Ahir Mehmood Khan. Factors influencing intention to obtain the HPV vaccine in South East Asian and Western Pacific regions: A systematic review and meta-analysis. *Nature*. 26 February 2018. Retrieved from: <https://doi.org/10.1038/s41598-018-21912-x>. Retrieved on 23 December 23, 2022.
- [2] Brian M. Slomovitz, Charlotte C. Suna, Michael Frumovitz, Pamela T.Solimana, Kathleen M. Schmeler, Heidi C. Pearson, Abbey Berenson, Pedro T.Ramirez, Karen H. Lua, Diane C. Bodurkaa. Are women ready for the HPV vaccine? *Gynecologic Oncology*, 2006, 103(1): 151-154.
- [3] Maria Grandahl, Tryggve Nevéus. Barriers towards HPV Vaccinations for boys and young men: A Narrative review. *MDPI Journals*. 2021, 13(8).
- [4] Icek Ajzen. The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 1991, 50(2): 179-211.
- [5] Gina Ogilvie, Maureen Anderson, Fawziah Marra, Shelly McNeil, Karen Pielak, Meena Dawar, Marilyn McIvor, Thomas Ehlen, Simon Dobson, Deborah Money, David M. Patrick, Monika Naus. A population-based evaluation of a publicly funded, school-based HPV vaccine program in British Columbia, Canada: Parental Factors Associated with HPV Vaccine Receipt. Published: May 4,2010. Retrieved from: <https://doi.org/10.1371/journal.pmed.1000270>. Retrieved on December 23, 2022.
- [6] Steven H. Chaffee, Joan Schleuder. Measurement and effects of attention to media news. *Human Communication Research*. 1986.
- [7] Ajzen I. Constructing a TPB questionnaire: Conceptual and methodological considerations. accessed on 12 January 2020.Retrieved from: <http://people.umass.edu/aizen/pdf/tpb.measurement.pdf>. Retrieved on December 23,2022
- [8] Hee Sun Park, Sandi W. Smith. Distinctiveness and influence of subjective norms, personal descriptive and injunctive norms, and societal descriptive and injunctive norms on behavioral intent: A case of two behaviors critical to organ donation. *Human Communication Research*, 2007, 33(2): 194–218.
- [9] Leslie B. Snyder, Ruby A. Rouse. The media can have more than an impersonal impact: The case of AIDS risk perceptions and behavior. *Health Commun*. 1995: 125–145.
- [10] Mei-Fang Chen. Self-efficacy or collective efficacy within the cognitive theory of stress model: Which more effectively explains people’s self-reported proenvironmental behavior? *Journal of Environmental Psychology*, 2015, 42: 66-75.
- [11] Andreas Homburg, Andreas Stolberg. Explaining pro-environmental behavior with a cognitive theory of stress. *Journal of Environmental Psychology*, 2006, 26(1): 1-14.
- [12] Revzina, N.V. Di Clemente R. J. Prevalence and incidence of human papillomavirus infection in women in the USA: a systematic review. *International Journal of STD & AIDS*, 2016, 16(8).
- [13] Serena Fitz Gerald, Nicola Cornally, Josephine Hogarth. Men's perspectives on cancer prevention behaviors associated with HPV. *Psycho-Oncology*, 2018, 27(2): 484-491.