

Parental knowledge, views, and perceptions of human papilloma virus infection and vaccination-cross-sectional descriptive study

Mansour A. Tobaiqy¹, Safaa A. Mehdar², Tasneem I. Altayeb², Tala M. Saad², Sulafa T. Alqutub³

¹Department of Pharmacology, Faculty of Medicine, University of Jeddah, Kingdom of Saudi Arabia, ²Medical Student, College of Medicine, University of Jeddah, Kingdom of Saudi Arabia, ³Family and Community Medicine Department, Faculty of Medicine, University of Jeddah, Jeddah, Kingdom of Saudi Arabia

ABSTRACT

Human papillomavirus (HPV) is a highly contagious virus that is linked to cervical cancer and is a major public health issue. Saudi Arabia national efforts aimed to have females aged 9-25 years to receive the available vaccine. **Objectives:** This study aims to explore parental knowledge, views, and perceptions around HPV in Saudi Arabia. **Methods:** A cross-sectional online questionnaire was used through direct interview to collect information from a group of parents attending King Abdul-Aziz University Hospital in Jeddah, Saudi Arabia. The questionnaire comprised items including demographics, knowledge, views, and perceptions of HPV infection and vaccination. **Results:** Of the 500 parents who participated in this study, only 54 (11%) had heard about HPV being associated with cervical cancer. The majority of the participants reported being from the middle social class (n = 472, 94.4%). The vast majority (n = 483, 96.8%) had never heard of the HPV vaccine and (n = 470, 94%) were unwilling to vaccinate their daughters. The primary reported reason behind refusing the vaccine was the lack of information on the importance of HPV vaccination (n = 426, 85.2%). The majority (n = 419, 83.8%) believed that there was insufficient information regarding vaccine safety and efficacy. Participants suggested ways to increase vaccination acceptance like social media awareness (n = 369, 73.8%), educational seminars in schools (n = 254, 50.8%), and a governmental platform (n = 218, 43.6%) providing information on HPV infection and promoting vaccination. **Conclusion:** Parents in the present study demonstrated a substantial lack of knowledge about HPV infection and vaccination, which may necessitate the establishment of national awareness campaigns.

Keywords: Human papillomavirus (HPV), knowledge, parents, Saudi Arabia, vaccination

Introduction

Human papillomavirus (HPV) is a highly contagious virus that is linked to cervical cancer which is considered to be as a major public health issue at the national and international levels. Cervical cancer is listed as one of the most common cancers in females

in Saudi Arabia and has become the third most common type of gynecological cancer in the country.^[1,2] Vaccines against HPV types 16 and 18 are now available and can reduce the incidence of cervical and other anogenital cancers.^[3] The HPV Working Group of the International Agency for Research on Cancer advised routine HPV vaccination for females aged 11 to 12 years in Saudi Arabia.^[4] They also suggested HPV immunization for girls between the ages of 13 and 26 years who had not received three vaccine doses.^[4] In Sweden, an HPV vaccine effectiveness study was conducted to assess the incidence of cervical cancer.

Address for correspondence: Dr. Sulafa T. Alqutub, 5340 Abdulrahman Bin Abi Farad, 23717 - AlBasatin Dist., Jeddah, Kingdom of Saudi Arabia.

E-mail: stalqutub@uj.edu.sa

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The results have shown a significant reduction in invasive cervical cancer among females aged 10-30 years.^[5] As per the Saudi national HPV Information Centre, approximately 10 million women (female population aged 15 years and more) are at an increased risk of cervical cancer in Saudi Arabia.^[4] Furthermore, 358 new cervical cancer cases are diagnosed annually with an estimated 179 deaths per year in the country.^[4]

Public health authorities are confronted with the need to increase HPV vaccination availability to all target groups, especially preadolescent girls, to reduce cancer risk.^[6] Research has shown that parents and patients are more likely to accept a vaccine if it is efficacious, safe, reasonably priced, and recommended by a physician. Widespread education of physicians, patients, and parents about the risks and consequences of HPV infection and the benefits of vaccination will be instrumental in fostering vaccine acceptance.^[7] In the United States, parental knowledge was identified as the main predictor of intent to vaccinate their children.^[8] During 2017-2018, the US national immunization survey for teens concluded that 58% of unvaccinated teens were offspring of parents without awareness of the HPV vaccine.^[8] In Western China, half of all respondents were willing to be vaccinated against HPV, despite only 29% having heard of HPV.^[9] A study in Ethiopia found the overall HPV vaccine acceptance was high. However, two of five and one-third of the parents had poor knowledge of cervical cancer and a negative attitude toward the HPV vaccine, respectively.^[10] Higher monthly income, good knowledge of HPV and the vaccine, and a positive attitude toward the vaccine were associated with acceptance of HPV vaccination.^[10]

Undoubtedly, HPV vaccination remains the cornerstone to mitigate HPV infection and to reduce the risk of cervical cancer.^[11] A recent study conducted in England, using data from a population-based cancer registry, revealed a reduction of approximately 87% in cervical cancer and incidence of cervical carcinoma in women aged 20 to 64 years, mainly for those who had taken the HPV vaccine at age of 12 to 13 years.^[12]

The Saudi Arabian Ministry of Health held a Cervical Cancer Prevention Week in 2021 which aimed to have all females aged 9-25 years vaccinated against the risk of HPV and cervical cancer.^[13] In 2020, Alrajeh *et al.*^[14] reported that by June 2015, 21% of individuals attending the primary healthcare in Riyadh city were aware of the vaccine against HPV and only 24% of them have the knowledge about the effectiveness of the vaccine in protecting against cervical cancer. This study will provide an insight into the challenges faced and act as a benchmark to measure changes in levels of awareness of HPV and uptake of the HPV vaccine among Saudi Arabia women and girls. The significance of the study in countries like Saudi Arabia with conservative cultures is embedded within parental knowledge on HPV infection and the advantages of HPV vaccination in cervical cancer prevention.

Also, this will support the national public health efforts about HPV infection prevention and the protective role of HPV

vaccination. The study aims to explore parental knowledge, views, and perceptions about HPV infection, cervical cancer, and HPV vaccination in Saudi Arabia.

Materials and Methods

Study setting and duration

The study was conducted from June to August 2021 at King Abdul-Aziz University Hospital in Jeddah, Saudi Arabia, a teaching hospital with 1,067 beds capacity. Parents of daughters aged 8 years or less were approached at pediatric and gynecology outpatient waiting areas and invited to complete the questionnaire.

Study design, data collection instrument and methods

A cross-sectional descriptive study. A prepiloted online questionnaire was used through direct interview to collect information from a group of parents, with the researcher reading out questions and recording the responses to promote inclusion. In compliance with Declaration of Helsinki, a written consent was obtained from each participant including participants who were identified as illiterate with their mark accepted in place of a signature.

The questionnaire contained 20 items (4 open questions, 11 multiple choices, and 5 yes or no questions) and was categorized into four sections: (1) demographics (sex, age of parent, education, marital status, social status, number of daughters); (2) parental knowledge; (3) perceptions; and (4) views about HPV and HPV vaccinations, including questions on how to increase public awareness about the importance of HPV vaccination. The questionnaire was initially reviewed for face and content validity by academic staff from departments of family and community medicine and pharmacology followed by piloting with 10 parents at the same hospital. No changes were made to the questionnaire; therefore, the pilot responses were included in the analysis. The questionnaire was in Arabic and translated into English. Potential participants were approached by a researcher within the study setting and were given an information leaflet. Those who agreed to participate had their answers captured electronically on a tablet or laptop. There were no exclusion criteria.

Sample size calculation

Regarding the sample size determination, from the previously published study on attitude and perception on HPV vaccination among young females within Saudi Arabia, the reported awareness on the effectiveness of the vaccine in cancer prevention was at 32.3%.^[11] Using an online OpenEpi Info Version 3, the calculated sample size was $n = 336$ at 95% confidence level for the survey. This was increased to more than 500 participants to compensate for any missing data.

Data analysis

Data analysis was undertaken using SPSS (SPSS Inc., Cary, NC, Version 21.0). Simple descriptive was used in reporting the results.

Chi-squared test was used to determine any association between sociodemographic characteristics of the participating parents and the acceptance of HPV vaccination; $P < .05$ was considered statistically significant.

Guidelines of reporting

To enhance the quality of reporting the observational study, STROBE criteria of reporting was used while preparing the report of this study.^[15]

Results

Of the 582 parents invited to take part, 500 questionnaires were completed to give a response rate of 86%. Majority of the respondents were mothers [Table 1]. Almost half of participants were educated to intermediate school level. A third were educated to university degree or diploma level and minority completing a postgraduate degree. Some self-reported as illiterate, but as the questions were read out by the researcher, they were able to participate.

The majority had never heard of the HPV vaccine and were not willing to vaccinate their daughters [Table 2]. When asked about the reasons for refusal, many said they had not received information regarding the importance of HPV vaccination.

Table 1: Sociodemographic characteristics of the participating parents (n=500)

	Frequency (n)	Percentage
Mean Age of the parents (\pm SD)		
43 (\pm 11.8)		
Sex		
Male	28	5.6%
Female	472	94.4
Education		
Postgraduate	22	4.4
Diploma/University	168	33.6
Secondary	143	28.6
Intermediate school	78	15.6
Elementary	31	6.2
Illiterate	56	11.2
Marital status		
Married	420	84.0
Divorced	45	9.0
Widowed	35	7.0
Perceived social status		
Low social class	14	2.8
Middle social class	472	94.4
High social class	14	2.8
Number of daughters		
1-2	285	57.0
3-4	164	32.8
5-6	36	7.2
>6	15	3.0

Table 2: Responses to items on HPV infection and vaccine safety and efficacy (n=500)

	Frequency (n)	Percentage
Do you know that HPV is associated with cervical cancer?		
No	446	89.2
Yes	54	10.8
Have you heard about the HPV vaccine? (n=497)		
Never heard about it	483	97.2
Heard about it from doctor	5	1.0
Heard about it from TV and social media	9	1.8
Are you willing to vaccinate your daughter with HPV vaccine when offered?		
No	376	75.2
Yes	124	24.8
Who should receive the HPV vaccine?		
Teenage females	2	0.4
Teenage males and females	8	1.6
Only females	7	1.4
Don't know	483	96.6
Which of the following is the source of transmission of HPV infection?		
Direct skin contact	1	0.2
Sexually transmitted disease	29	5.8
Don't know	470	94.0
Are you aware that the HPV vaccine can help to prevent different types of cancer?		
No	491	98.2
Yes	9	1.8
Which of these reasons is a factor as to why your child has not received the HPV vaccine? (multiple answers option)		
I have not been informed about the importance of the vaccine by the Ministry of Health	2	0.4
There is insufficient information about the efficacy and safety of the vaccine in the media and newspapers	11	2.2
Not recommended/mentioned by our doctor	1	0.2
Concern that the vaccine is not effective	485	97.0
Concern about the safety of the vaccine	426	85.2
My daughter is too young for the vaccine	419	83.8
It is expensive and not covered by insurance	65	13.0

The majority believed that there was not sufficient information regarding the safety and efficacy of HPV vaccines [Table 2]. Married parents were more likely to accept vaccination which was statistically significant ($P = 0.02$). Parents who considered themselves to belong to the middle social class were more likely to accept vaccination ($P = 0.012$).

Participants suggested ways to increase vaccination acceptance. These included posting social media awareness materials ($n = 369, 73.8\%$), organizing educational seminars by healthcare specialists in schools ($n = 254, 50.8\%$), and a governmental platform to provide accurate information about HPV vaccines ($n = 218, 43.6\%$).

Discussion

Knowledge, believe, and willingness to vaccinate

This study has identified several issues relating to parental knowledge and perceptions of HPV infection and vaccination in Saudi Arabia. Almost 97% ($n = 483$) of parents surveyed had never heard of the HPV vaccine and were not willing to vaccinate their daughters (94%). A similar finding was revealed in another study that involved 1,400 female university students in Saudi Arabia where 96% of surveyed students demonstrated a lack of knowledge regarding cervical cancer and HPV's role as a major risk factor for cervical cancer.^[3]

In this single hospital study, married and middle social class parents were more likely to accept vaccinating their daughters. A study conducted in Thailand, whose population also has strong religious beliefs, found an association between parents' knowledge and beliefs and the acceptance of HPV vaccination for their daughters.^[16] Thailand is one of the countries with the highest occurrence of cervical cancer globally. Hence, the overall acceptance of the HPV vaccine was higher among parents who declared a strong religious belief.^[16] Of note, in this study, parental refusal of HPV vaccination was largely due to either not receiving sufficient information relating to the importance of HPV vaccines to mitigate infection and cancers (85%) or concerns over the safety and efficacy of the vaccine (84%).

The difference in Perceived effectiveness of the educational sources

As per a systematic review of 53 international studies, parents' knowledge about HPV infection has increased from 60% in 2005 to 93% in 2009 and their belief in the link between HPV infection and the prevention of cervical cancer from 70% in 2003 to 91% in 2010. In 2011, a systematic review reported on articles from North America (USA: 56.6%; Canada: 3.8%), the European Union (24.5%), Asia (9.4%), and New Zealand or Australia (5.7%). However, parents still had safety concerns and wanted more information from their physician.^[17] This contrasts with the low level of knowledge demonstrated by parents ($n = 426, 85.2\%$) in the present study. Also, parents had suggested being educated about the HPV vaccine via social media

resources ($n = 369, 73.8\%$), school seminars ($n = 254, 50.8\%$), and a governmental platform that answers questions about the safety and efficacy of the vaccines ($n = 218, 43.6\%$).

A recent systematic review across 16 European countries with the United Kingdom having most publications ($n = 20, 28.6\%$), followed by Italy ($n = 10, 14.3\%$) and Sweden ($n = 8, 11.4\%$), found that the most effective way to increase knowledge around HPV vaccination was to establish a Vaccination Center (77.3%) and to be informed about the vaccine by a pediatrician during academic sessions.^[18]

A considerable effort needs to be made to correct the Saudi Arabian general public's attitude toward the role of HPV vaccination in preventing cervical cancer. In this study, 98.2% of parents were unaware of the association between HPV vaccination and cancer prevention. A qualitative study concluded that linking HPV vaccination and other childhood vaccines when educating parents is effective in increasing vaccine acceptance.^[19]

Limitations

While this study has added to the literature on the perspectives of the parental knowledge, views, and perceptions of HPV infection and vaccination, there are a number of biases including selection and recruitment biases (parents of young daughters aged less than 8 years were attending in a single hospital and may not have been representative of the general population in Jeddah) and issues of generalizability to countries and settings. In addition, Saudi Arabia is a relatively conservative community in which sexual health issues are not discussed. This may explain why there is insufficient knowledge regarding HPV and its vaccines. However, this study provides valuable information about the current knowledge of a considerable number of parents in Saudi Arabia about HPV infection and perceptions of HPV vaccination and their views highlight a potential risk for young women that must be addressed.

Future studies

Future research should focus on testing methods of effective awareness raising about HPV infection, cervical cancer, and the role of vaccination. The best method is to approach and educate parents about these risks and to promote culturally appropriate parental acceptance on HPV vaccines must also be considered in the future research.

Conclusion

Parents in a single hospital in Saudi Arabia demonstrated a substantial lack of knowledge of HPV and HPV vaccination despite the Ministry of Health's efforts to inform the public. Their reluctance to vaccinate their daughters may necessitate the establishment of a national HPV awareness campaign at various setting health services delivery area especially the primary healthcare centers to create required change in the attitudes and behaviors.

Recommendations

There is a need to develop initiatives to promote parental awareness, acceptance, and uptake of HPV vaccines for targeted groups to minimize the risks of cervical cancer. Further studies at the national level with health education theoretical framework application, such as the health believe model, will allow a better understanding of parental vaccine hesitancy, perceived benefits, and barriers to vaccinate.

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Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Ethical approval

The methodology for this study was approved on July 4, 2021 by the Human Research Ethics Committee in the Faculty of Medicine at King Abdul-Aziz University, Saudi Arabia (Reference No. 371-21).

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Conflicts of interest

There are no conflicts of interest.

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