



Awareness of HPV and HPV vaccines, acceptance to vaccination and its influence factors among parents of adolescents 9 to 18 years of age in China: A cross-sectional study

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ABSTRACT

Background: Vaccination uptake rates for adolescents are still low in China despite safe and effective human papillomavirus vaccines being available. The awareness and attitudes of parents to HPV vaccines play a decisive role in adolescents' HPV vaccination uptake.

Methods: A cross-sectional study was conducted from March, 2022 to May, 2022 using an anonymous questionnaire among parents of 9 to 18 years of age from 73 cities in 23 provinces in mainland China. Demographic characteristics of parents, their knowledge and attitudes about HPV and HPV vaccination, as well as factors influencing HPV vaccination in adolescents were assessed.

Results: More than two-thirds of parents heard of HPV (75.5%) and HPV vaccines (84.7%). Of these participants, mothers (83.8%) were in the majority. Parents willing to vaccinate themselves and their children against HPV were 84.9% and 87.6%, respectively. Parents were more likely to vaccinate their daughters against HPV than their sons ($P < 0.001$). Parents who had heard of the HPV vaccines ($P = 0.028$) or had vaccinated themselves ($P < 0.001$) were more likely to have HPV vaccination for their children. Parents who accepted the price of the HPV vaccines ($P = 0.005$) were more likely to have their children vaccinated against HPV.

Conclusions: Children's gender, awareness of the HPV vaccines, parental HPV vaccination, and the price of the HPV vaccines are likely to be the reason for parents' vaccine hesitancy for adolescents.

Practice implications: Nurses have a critical role in identifying parental hesitancy and providing individualized education to expand the parental awareness and knowledge and encourage on-time adolescents vaccination.

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Introduction

The HPV is a double-stranded deoxyribonucleic acid virus with >200 subtypes, which is highly infectious, virulent, and recurrent (Lv et al., 2022). Currently, HPV is divided into high-risk and low-risk types (Rosalik et al., 2021) and persistent high-risk types of HPV infection can raise the risk of cervical cancer or other HPV-related cancer, including oropharyngeal, anal, penile, and anal cancers (Pérez-González et al., 2022). Additionally, data indicated that for various stages of the HPV-related cancer, the lifetime cost exceeded 17,000 dollars in China (Ding et al., 2021). Therefore, HPV-related illnesses have a significant negative impact on both health and the economy (Hirth, 2019). However, approximately 50%–80% of men and women who are sexually

active could acquire at least one type of HPV in their lifetime (St Laurent et al., 2018). Thus, preventing HPV infection has come into emphasis.

The HPV vaccines can cover the major prevalent high-risk HPV subtypes and HPV vaccination can decrease cancer-related HPV morbidity and mortality, enhance health outcomes, and lower healthcare expenditures (Ferlay et al., 2019; Hirth, 2019; Michaeli et al., 2022). Thus, HPV vaccination is considered to be one of the most cost-effective measures against HPV infection and HPV-related disease. To date, 125 countries have introduced the HPV vaccines into their national immunization programme (World Health Organization, 2022). Although the China Food and Drug Administration (CFDA) has subsequently approved and licensed five HPV vaccines, such as the bivalent HPV vaccine *Cervarix* in 2016, the quadrivalent HPV vaccine *Gardasil 4* in 2017, the nine-valent HPV vaccine *Gardasil 9* in 2018, the domestic bivalent HPV vaccine *Cecolin* in 2019, and the domestic bivalent HPV vaccine *Walrinvax* in 2022, these vaccines are not included into national immunization

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programme (Li et al., 2023). Currently, three-dose HPV vaccines are highly immunogenic to girls aged 9 to 15 years of age, the World Health Organization recommends a one or two-dose schedule for girls aged 9 to 14 years of age (World Health Organization, 2022). However, the first dose of HPV vaccine vaccination rate in adolescents aged 9 to 15 was 7.95% in Ningbo (Liu et al., 2020). To our knowledge, the HPV vaccines are Class II vaccine and need to be self-paid by individuals at their own expense in China, which means that adolescents should seek parental advice as they cannot choose HPV vaccination on their own (Xie et al., 2021). It is evident that parental attitudes and acceptance of the vaccines play a key role in their decisions to vaccinate adolescents against HPV (Newman et al., 2018). Earlier surveys have shown that only 36.2% of parents accept HPV vaccination for their adolescents (Zhang et al., 2015). Low parental awareness of the HPV vaccines will affect vaccination rates in adolescents (He et al., 2020). Therefore, there is a need to identify the drivers influencing HPV vaccines uptake and to increase HPV vaccination among 9 to 18 years of age.

Various health-related behavior theories and models have been developed and used to offer a prediction about beliefs and perceptions likely to impact uptake and adherence to the HPV vaccines, including the Health Belief Model (Rosenstock, 1974), the Theory of Planned Behavior (Juraskova et al., 2012), and the Vaccine Perceptions, Acceptability and Adherence Model (Katz et al., 2010). The structure of the health belief model includes perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, self-efficacy, socio-demographic characteristics, and the factors that induce health behaviors (Rosenstock, 1974). The theory of planned behavior is an important theoretical model to explain the factors affecting people's health behavior from the perspective of social psychology, which is used to predict the behavioral intention than behavior per se (Radisic et al., 2017). The theory of planned behavior claims that attitudes, subjective norm, and perceived behavioral control, which also predict intention and behavior (Nguyen et al., 2020). A systematic review demonstrated that the theory of planned behavior was a suitable model to explain what factors influence parents' acceptance of the HPV vaccines (Wijayanti et al., 2021). The vaccine perceptions, acceptability and adherence model emphasize that individual, sociocultural and political-economic conditions influence the perceived risk of disease transmission and vaccine effectiveness. For example, adolescent and caregiver experiences may influence HPV vaccines acceptance and adherence (Katz et al., 2010). To our knowledge, previous studies have focused on awareness and attitudes in college students (Dai et al., 2022; Yin et al., 2021) and adult females (Lin et al., 2019; Qin et al., 2020) in relation to HPV vaccination, few surveys have examined knowledge and attitudes towards HPV vaccination among parents of young adolescents in China (Zhang et al., 2015). Therefore, based on the above theoretical research framework, this study aims to assess parents' knowledge and attitudes about HPV and HPV vaccines and the factors influencing HPV vaccination among adolescents in China.

Methods

Study design and participants recruitment

We conducted a descriptive, cross-sectional design, participants were recruited through convenience and snowball sampling. Data were collected on the JinShuJu website (<https://jinshuju.net/>). JinShuJu is an online tool based on Chinese web surfing habits. We recruited 1534 parents of adolescents aged 9 to 18 years of age in mainland China. The survey was carried out from March 2022 to May 2022. With the support of relevant authorities, we invited sixty parents of adolescents aged 9 to 18 years of age to participate in the study from three research settings: schools, hospitals, and community health centers. These individuals will know and have access to other similar individuals, so we used the snowball sampling technique and these people were used as the main seeds to invite similar people to participate in

online links or quick response codes, etc. In order to ensure the reliability data and reduce bias, all items are set as mandatory questions and each device or internet protocol address could be submitted only once to avoid repeated answers.

Sample size

The sample size was calculated by the Power Analysis and Sample Size Software (PASS) 15.0, according to previous literature (Wang et al., 2015), the percentage of parental acceptance of HPV vaccination for their children was 0.4, within the tolerance $\delta = 0.03$, confidence level $(1 - \alpha) = 0.95$, at least 1056 cases should to be included, considering 20% dropout rate, the required sample size was 1320.

Measures

We used an anonymous online questionnaire designed and validated by experts based on the published literature (Pu et al., 2018). The questionnaire consisted of three dimensions. The first dimension evaluated demographic characteristics of parents, such as children's gender, relationship with children, profession, education, and annual household income, the second dimension assessed parental awareness of the HPV and the HPV vaccine, and the third dimension evaluated parental attitudes towards HPV vaccination for their adolescents.

Data analysis

Statistical analyses were used Statistical Product and Service Solutions (SPSS) 26.0 software, demographic characteristics of parents, parental awareness of HPV and HPV vaccine, and parental attitudes towards HPV vaccination were described with frequency and percentages. The differences in parental acceptance of HPV vaccination and characteristics among adolescents were compared using the chi-square test. Multivariable logistic regression was used to analyze the influencing factors of parental acceptance of HPV vaccination for their adolescents. The wald test was expressed as odds ratios (OR) and 95% confidence intervals (95%CI). Statistically significant findings with a two-sided test were set at a p -value of <0.05 .

Ethical considerations

The study was approved by the Ethics Committee of West China Second University Hospital (Approval Number-2022030). The survey was an anonymous electronic questionnaire following the principles of informed consent anonymity, and confidentiality. Participants were provided an electronic link, which described the nature of the study, potential risks and benefits, and the option to decline participation.

Results

Demographic characteristics

A total of 1431 questionnaires were included in the final study analysis. Among all the participants, mothers (83.8%) were in the majority, and fathers (16.2%) were in the minority. Almost half of the children's gender was female (66.8%), over one-half of parents (56.7%) had junior and senior high education, less than half of parents (41.4%) had a total annual family income of $>100,000$ Renminbi. (Table 1).

Parental awareness of the HPV and the HPV vaccines

Most parents (75.5%) had heard about HPV (75.5%) and were afraid of cervical cancer or HPV-related diseases (71.6%). The majority of parents knew that HPV infection can cause cervical cancer (79.7%), while anal cancer (43.9%) and sexually transmitted diseases (39.1%) were relatively low. A number of parents had heard of the HPV vaccines (84.7%)

Table 1
Demographic characteristics of parents of adolescents 9–18 ($n = 1431$).

Variables	Number	Frequency (%)
Children's gender		
Male	475	33.2
Female	956	66.8
Relationship with children		
Mother	1199	83.8
Father	232	16.2
Profession		
Enterprise employee	316	22.1
Medical staff	123	8.6
Others	992	69.3
Education		
Primary	76	5.3
Junior and senior high	811	56.7
College and above	544	38.0
Annual household income (Renminbi, Year)		
<10,000	83	5.8
10,000–50,000	338	23.6
50,000–100,000	417	29.1
>100,000	593	41.4

Note: 1 Renminbi (RMB) = 0.16 United States of America Dollar.

and knew that it could prevent HPV-related disease (76.9%), but approximately half of the parents (53.9%) knew that the HPV vaccines were the most effective when uptake between the ages of 9 to 13. (Table 2).

Parental willingness and attitudes towards HPV vaccination

Parents willing to vaccinate themselves and their children against HPV were 84.9% and 87.6%, respectively. Only 12.4% of parents refused

Table 2
Parental awareness of the HPV and the HPV vaccines among parents of adolescents 9–18 years of age ($n = 1431$).

Variables	N (%)
Have you heard of cervical cancer/penile cancer/anal cancer/genital warts etc.	
Yes	1317 (92.0)
No	114 (8.0)
Have you worried about having cervical cancer/penile cancer/anal cancer/genital warts etc.	
Yes	1025 (71.6)
No	406 (28.4)
Have you heard of human papillomavirus (HPV)	
Yes	1080 (75.5)
No	351 (24.5)
What do you think HPV infection can cause (multiple choice)	
Cervical cancer	1141 (79.7)
Penile cancer	689 (48.1)
Anal cancer	628 (43.9)
Sexually transmitted diseases	559 (39.1)
Genital warts	717 (50.1)
Unclear	271 (18.9)
Have you heard of human papillomavirus vaccines (HPV vaccines)	
Yes	1212 (84.7)
No	219 (15.3)
Did you know that the HPV vaccines can prevent cervical cancer/penile cancer/anal cancer/genital warts etc.	
Yes	1100 (76.9)
No	331 (23.1)
Did you know that the HPV vaccines were most effective when uptake between the ages of 9 to 13 years of age.	
Yes	772 (53.9)
No	659 (46.1)

to vaccinate their children aged 9 to 18 against HPV, with safety and efficacy being the main reason for their consideration. Specifically, a higher proportion of parents (86.3%) were willing to vaccinate themselves or their children if the HPV vaccines were included in the national immunization programme. Meanwhile, affordable health insurance (7.3%), recommendations from family members or friends (26%), and a reasonable price (58.5%) may increase enthusiasm for HPV vaccination. General hospitals or maternal and child health centers (80.9%) were considered the best vaccination facilities. More than half of the parents (63.4%) were positive for the HPV vaccination in China. (Table 3).

Influencing factors of parental acceptance of HPV vaccination for their children

The single-factor analysis results showed children's gender ($\chi^2 = 77.981, P < 0.001$), the relationship of children ($\chi^2 = 29.856, P < 0.001$), heard of HPV ($\chi^2 = 110.013, P < 0.001$), heard of HPV vaccines ($\chi^2 = 201.225, P < 0.001$), parental HPV vaccination ($\chi^2 = 663.606, P < 0.001$), acceptance of the price of HPV vaccines ($\chi^2 = 46.524, P < 0.001$) were significant. (Table 4).

In multivariable logistic regression analysis, four variables were significantly associated with parental of acceptance of HPV vaccination for their children. Parents were more likely to vaccinate their daughters against HPV than their sons ($OR = 2.686, 95\% CI 1.697–4.250, P < 0.001$). Parents who had heard of the HPV vaccines ($OR = 1.917, 95\% CI 1.073–3.425, P = 0.028$) or had vaccinated the HPV vaccines themselves ($OR = 37.537, 95\% CI 23.414–60.179, P < 0.001$) were more likely to HPV vaccination for their children. Parents who accepted the price of the HPV vaccines ($OR = 1.983, 95\% CI 1.226–3.208, P = 0.005$) were more likely to have their children vaccinated against HPV. (Table 5).

Discussion

Vaccination is the most direct and effective measure to prevent HPV infection and HPV-associated diseases (Athanasidou et al., 2020). This

Table 3
Parental willingness and attitudes towards HPV vaccination.

Variables	N (%)
HPV vaccination for themselves	
Yes	1215 (84.9)
No	216 (15.1)
HPV vaccination for their children	
Yes	1253 (87.6)
No	178 (12.4)
Reasons for unwilling to HPV vaccination for their children	
Child too young to be risk of HPV-related disease	42 (2.9)
The vaccines were not yet widely available	59 (4.1)
Concerns about the safety or effectiveness of the vaccine	93 (6.5)
Others	54 (3.8)
What might prompt you or your children to get the HPV vaccines (multiple choice)	
Vaccines included in the national immunization programme	1235 (86.3)
National Health Insurance covers vaccination costs	104 (7.3)
Vaccination is highly recommended by family members or friends	372 (26.0)
Vaccines price come down to within acceptable range	837 (58.5)
Others	171 (11.9)
Where is a more appropriate facility for HPV vaccination (multiple choice)	
Centre for Disease Control and Prevention	1096 (76.6)
Community Health Centre / Local Clinics	698 (48.8)
General Hospitals or Maternal and Child Health Centers	1157 (80.9)
Schools	450 (31.4)
Others	38 (2.7)
What attitudes towards the promotion of HPV vaccination	
In favor, it can be effective in preventing HPV-related disease	907 (63.4)
Neutral, the prices are too high to unaffordable	431 (30.1)
Against, it could lead to greater social disorder	19 (1.3)
Others	74 (5.2)

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Others	74 (5.2)

Table 4
Single-factor analysis of parental acceptance of HPV vaccination for their children (n = 1431).

Variables	Parents' acceptance of HPV vaccination for their children N (%)	χ^2	P
Children's gender		77.981	<0.001*
Male	364 (76.6)		
Female	889 (93.0)		
Relationship with children		29.856	<0.001*
Mother	1075 (89.7)		
Father	178 (76.7)		
Profession		5.902	0.052
Enterprise employees	272 (86.1)		
Medical staff	116 (94.3)		
Others	865 (87.2)		
Education		1.305	0.521
<Primary	65 (85.5)		
Junior and senior high	717 (88.4)		
>College and above	471 (86.6)		
Annual household income (Renminbi, Year)		6.788	0.079
< 10,000	68 (81.9)		
10,000–50,000	288 (85.2)		
50,000–100,000	376 (90.2)		
> 100,000	521 (87.9)		
Heard of HPV		110.013	<0.001*
Yes	1002 (92.8)		
No	251 (71.5)		
Heard of HPV vaccines		201.225	<0.001*
Yes	1125 (92.8)		
No	128 (58.4)		
Parental HPV vaccination		663.606	<0.001*
Yes	1179 (97.0)		
No	74 (34.2)		
Acceptance of the price of HPV vaccines		46.524	<0.001*
Yes	873 (94.6)		
No	380 (83.3)		

Note: * P < 0.05.

article mainly discussed parents' knowledge and attitudes about HPV and HPV vaccines and the factors related to parental intention to vaccinate adolescents against HPV. Firstly, more than half of the parents had heard of HPV (75.5%), which finding was lower than Brazilian immigrants in the United States of America (93.6%) (Marlow et al., 2013), higher than Turkey (35.2%) (Akca & Akca, 2022) and Northern Cyprus (43%) (Abuduxike et al., 2022). Secondly, the majority of parents

Table 5
Multivariable logistic regression analysis of parental acceptance of HPV vaccination for their children.

Variables	Categories	B	SE	Wald	P	OR (95% CI)
Children's gender	Male ^a					2.686
	Female	0.998	0.234	17.799	<0.001*	(1.697–4.250)
Relationship with children	Father ^a					1.001
	Mother	0.001	0.276	0.001	0.998	(0.583–1.717)
Heard of HPV	No ^a					1.399
	Yes	0.336	0.280	1.439	0.230	(0.808–2.423)
Heard of HPV vaccines	No ^a					1.917
	Yes	0.651	0.296	4.831	0.028*	(1.073–3.425)
Parental HPV vaccination	No ^a					37.537
	Yes	3.625	0.241	226.633	<0.001*	(23.414–60.179)
Acceptance the HPV vaccines price	No ^a					1.983
	Yes	0.685	0.245	7.777	0.005*	(1.226–3.208)

Note: ^a Reference group, * P < 0.05, OR = Odds Ratio, CI = Confidence Interval.

(84.7%) had heard of the HPV vaccines, which was lower than the United States of America (92%) (Marlow et al., 2013), higher than Brazil (75.91%) (Kops et al., 2019), and Northwest Ethiopia (63.4%) (Sinshaw et al., 2022). The discrepancy in heard of HPV and HPV vaccines may be due to differences in geographical locations, national immunization programme, and level of socioeconomic development in countries and regions. Moreover, it should be noted that parents' awareness and knowledge about HPV and HPV vaccines in this study were higher than previous studies in China (Hu et al., 2021; Xie et al., 2021). This may be because the fact that most of the participants were mothers, and mothers focused more on knowledge and information about cervical cancer prevention. Presently, it has been seven years since the first HPV vaccines were approved in China (Li et al., 2023). With the effort of Chinese medical association, the HPV vaccines were also included in the guidelines as the main preventive measure against cervical cancer to increase public awareness about HPV infection (Gynecological Oncology Society of Chinese Medical Association and Chinese Society for Colposcopy and Cervical Pathology, 2021). In addition, more than two-thirds of parents (87.6%) would like to have their children vaccinated against HPV, this finding was lower than in the United States of America (94.6%) (Lindley et al., 2016) and Canada (88%) (Krawczyk et al., 2015). These inconsistent results might be due to the HPV vaccines have been available in these developed countries for a long time. Furthermore, the HPV vaccines were included in the national immunization programme for free vaccinations for adolescents in the United States of America and Canada (Krawczyk et al., 2015; Lindley et al., 2016). Whereas the HPV vaccines were Class II vaccine and must be paid by individuals in China. Therefore, poor economic conditions may discourage parents' willingness to vaccinate their adolescents against HPV. This study also showed that the majority of parents have willingness to vaccinate their adolescents if the HPV vaccines were included in the national immunization programs and the price is reasonable. We strongly recommended that the implementation national immunization programme, reimbursement of vaccines through health insurance, and reduction of vaccines price will facilitate the widespread availability of HPV vaccines.

Children's gender may influence parents' intention to vaccinate their adolescents with the HPV vaccine. Parents are more likely to vaccinate their daughters against HPV than their sons, which was consistent in the previous study (López et al., 2022). This may be due to the epidemiological characteristics of high-risk HPV infections in women. The World Health Organization (World Health Organization, 2022) and the Chinese Expert Consensus (Gynecological Oncology Society of Chinese Medical Association and Chinese Society for Colposcopy and Cervical Pathology, 2021) recommended HPV vaccination as a priority for low-age girls before sexual exposure. Therefore, the urgent priority was to vaccinate adolescents and ensure high coverage among adolescents to reduce the incidence of cervical cancer. We recommend that the government consider prioritizing strategies among vaccine target groups and continue to promote HPV vaccination for adolescents.

Hearing of the HPV vaccine may influence parents' willingness to vaccinate their adolescents against HPV. Previous literature pointed out that the main reason why parents do not vaccinate their daughters against the HPV vaccine was a lack of knowledge about HPV vaccination and cervical cancer (Wang et al., 2015). Conversely, increasing awareness of HPV vaccines may increase parental acceptance of adolescent vaccination (Lindsay et al., 2020). This study suggests that promoting parental awareness and knowledge of HPV vaccines was a factor in motivating parents to vaccinate their adolescents against HPV. Therefore, healthcare providers can raise awareness and knowledge of HPV vaccines among parents through educational interventions, which is the first step to increase HPV vaccination among adolescents.

Parental HPV vaccination may influence parents' intention to vaccinate their adolescents with HPV vaccines. This result was consistent with a previous study (Zhong et al., 2022). In this study, some parents who vaccinated themselves may be willing to vaccinate their

adolescents with the HPV vaccine, whereas the core concern of parents who refuse to vaccinate their children was the safety and effectiveness of vaccines. Thus, it is necessary to increase parent trust in the HPV vaccine. A study found that adolescents trust their mothers more than doctors and healthcare providers when making decisions about HPV vaccination (Karafillakis et al., 2022). Therefore, we suggest that it is essential to enhance the parental trust in HPV vaccines or to increase parental HPV vaccination so that they could have the willingness to vaccinate their adolescents.

The price of HPV vaccines could influence parents' HPV vaccination of adolescents. Regardless of transport, storage, and administration, HPV vaccines were not free-of-charge vaccines in China (Lin et al., 2019). Previous studies showed that 40.1% of parents felt they could afford <100 Renminbi, 70% of parents were willing to pay <100 Renminbi for the HPV vaccines for their adolescents, and only 12.9% of parents could afford it if it cost >500 Renminbi (Wang et al., 2015). However, the imported HPV vaccines use a three-dose vaccination strategy, and the total price is about 2397 Renminbi, which is beyond the affordability of many families. The higher price of HPV vaccines would affect vaccination rates and coverage among the target population. At present, a survey showed that the domestic bivalent HPV vaccine *Walrinvax* is available and the price of three doses is 957 Renminbi which is less than half of the imported HPV vaccine (Zou et al., 2020). In terms of availability, *Walrinvax* is more affordable and cost-effective for mass vaccination. With the domestic HPV vaccines safety issues arousing social concerns, it is not the first choice for the public. Therefore, we suggest that the government should reduce the price of the imported HPV vaccines, strengthen public trust in the domestic vaccine, and increase HPV vaccination coverage.

Limitations

A limitation of the study is convenience sampling rather than probability sampling, which means that not all participants have an equal opportunity in the study. Therefore, the results of this research cannot generalize to the whole country. In addition, the population with a higher proportion of mothers, which probably reflects some degree of participant bias. Therefore, we recommend that further studies can adopt random sampling and conduct high-quality studies. What's more, fathers' awareness and acceptance of HPV vaccination for their adolescents also should be considered.

Implications to practice

Despite the high protection rate of the HPV vaccines, adolescent vaccination coverage in our country remains worrisome. On the one hand, parental awareness and acceptance of the HPV vaccines play a central role in current HPV vaccines among adolescents. Therefore, the nurse should address parents' concerns and hesitations and personalize education to promote on-time adolescent vaccination. Furthermore, the HPV vaccines price also deserve national attention. Some provinces and cities have launched free vaccination programme for the domestic bivalent HPV vaccines since 2020, such as Jinan in Shandong, Xiamen in Fujian, Shijiazhuang in Hebei, and Chengdu in Sichuan. Accordingly, the government should develop a national immunization programme and prioritize the target population to promote HPV vaccination among adolescents.

Conclusion

We found that parents of adolescents aged 9–18 years of age have some understanding of HPV and HPV vaccine, but some parents still hesitate to vaccinate their children due to children's gender, awareness of the HPV vaccine, parental HPV vaccination, and the price of the HPV vaccine. Hence, we recommended that the government should reduce the prices of HPV vaccines and prioritize the target population among

adolescents. The nurse should provide personalized education to raise parental awareness and knowledge of HPV vaccines.

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Hong Xie: Methodology, Writing – Original draft, Supervision.
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Ya-Nan Yin: Conceptualization, Study design, Review & Editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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