

Knowledge about Human Papillomavirus and Cervical Cancer Prevention among Intern Nurses

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Received: April 13, 2020; Accepted: August 13, 2020; Published: November 21, 2020

ABSTRACT

Objective: Intern nurses will play an important role in the use of vaccination to prevent cervical cancer. This study assesses the knowledge about human papillomavirus (HPV) infection and cervical cancer prevention among intern nurses. **Methods:** We developed a questionnaire to investigate intern nurses' knowledge about HPV infection and cervical cancer prevention. Participants included 323 intern nurses from eight schools. **Results:** The effective response rate was 79.8%. Some (7.0%) knew that early-stage cervical cancer is commonly asymptomatic. Only 9.7% knew that infection is generally

asymptomatic and 20.5% knew that vaccination has no major side effects. There were differences in gender, age, school type, and place of residence for several questions. **Conclusions:** This study indicates a low level of knowledge about HPV infection and cervical cancer prevention among intern nurses. Our findings highlight the need for more education in this topic to increase the knowledge of intern nurses.

Key words: Cervical cancer prevention, human papillomavirus infection, intern nurses

Introduction

Worldwide, cervical cancer is the second most commonly diagnosed cancer and the third leading cause of cancer death among females in less developed countries. There were an estimated 569,847 new cervical cancer cases and 311,365 deaths annually, with more than 90% of cases occurring in developing countries.^[1] In contrast to the decreasing incidence trends in developed countries, a substantial increase in cervical cancer incidence was seen in China. From 2000 to 2011, the morbidity of cervical cancer increased from 4/100,000 to 10/100,000. It is the sixth most commonly diagnosed cancer and the eighth

leading cause of cancer death among females in China.^[2] The morbidity of cervical cancer among younger women is increasing, and mortality rates in rural China are still high, such as in Shanxi.^[3] Thus, cervical cancer is a serious public health issue in China.

Human papillomavirus (HPV) infection is the most important factor in the development of cervical cancer.^[4,5] HPV types 16 and 18 (HPV16 and HPV18) are the most carcinogenic HPV genotypes and were detected in 6357 out of 10,575 invasive cervical cancer cases.^[6-8] In one study, the HPV-positive rate of the obstetrics and gynecology

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Cite this article as: Pu J, He M, Pu Y, Liu Z, Le L, Wang H, *et al.* Knowledge about Human Papillomavirus and Cervical Cancer Prevention among Intern Nurses. *Asia Pac J Oncol Nurs* 2021;8:46-50.

Access this article online

Quick Response Code:



Website: www.apjon.org

DOI:
10.4103/apjon.apjon_45_20

outpatient “clinics” group (37.62%) was significantly higher than that of the “health examination center” group (15.29%) in the Chinese province of Sichuan.^[9] HPV is the most common sexually transmitted infection, and nearly all sexually active women will experience at least one type of HPV infection at some point in their lives.^[10] Because oncogenic HPV infection is necessary for the development of cervical cancer, prophylactic vaccines are likely to be of value as a primary prevention strategy.^[11]

The target group of HPV vaccination is young adolescent girls. In a base-case analysis, vaccinating 17-year-olds was found to have reduced their lifetime risk of treatment for precancerous lesions from 7.77% to 3.48% and their lifetime cervical cancer risk from 0.52% to 0.24%.^[12] The Food and Drug Administration (FDA) of the United States approved a quadrivalent vaccine against HPV types 6, 11, 16, and 18 in June 2006,^[13] and the European Commission approved a bivalent vaccine against types 16 and 18 in September 2007. Both products seem to be effective, safe, and well tolerated.^[14] Moreover, a clinical trial showed that the administration of the HPV vaccine to HPV-naive women and women who are already sexually active could substantially reduce the incidence of HPV16/18-related cervical precancers and cancer.^[15] A long observation confirmed these results.^[16,17] Phase III clinical trials of both prophylactic vaccines are in the final stages in China, and they have been approved by the China FDA.

The reason why we focus our study on intern nurse candidates is that once they graduate, they will be the most important staff group providing health education to patients and the public. Previous studies have demonstrated that the awareness of the correlation between HPV and cervical cancer among the general public and health-care professionals is low to moderate.^[18] The aim of this study was to assess the knowledge about HPV infection and cervical cancer prevention among intern nurses, who will play an important role in the use of HPV vaccination to prevent cervical cancer.

Methods

The study was approved by the Medical Ethics Committee of Mianyang Central Hospital. Since nurses completed the survey questionnaire anonymously, and data were also analyzed anonymously, informed consent was not obtained from the participants. All participants were hospital intern nurses and were to graduate within a year. We developed a questionnaire by taking a survey instrument previously used to investigate medical students’ knowledge about HPV infection, cervical cancer, and willingness to pay for cervical cancer vaccination, and modifying it for intern nurses.^[18] Pilot testing and survey revision was carried out with a sample of twenty intern nurses in Mianyang Central

Hospital. Intern nurses from eight schools in Sichuan took part in the study.

Both descriptive and univariate analyses were conducted to identify the population characteristics and knowledge about HPV infection and cervical cancer prevention. All categorical variables including the respondents’ sociodemographic characteristics and knowledge about HPV infection and cervical cancer prevention were expressed as frequencies and percentages. Statistical analyses were conducted using the SPSS version 23.0 (SPSS Inc., Chicago, IL, USA) software.

Results

A total of 323 intern nurses were involved in this study, and 268 questionnaires were returned (82.9%); however, ten intern nurses did not complete the questionnaires (only one-third or half of the questions were answered). Thus, the effective response rate was 79.8% (258/323). The demographic characteristics of the 258 intern nurses in this survey are shown in Table 1.

Only 63.6% of the participants knew that cervical cancer is the second most common female cancer in China, and 56.6% knew that most cervical cancer is caused by HPV infection. Most participants agreed that cervical screening could prevent morbidity and mortality from cervical cancer (88.0%), and correctly identified risk factors for cervical cancer such as smoking (89.9%), having multiple sexual partners (84.5%), and sex at an early age (82.9%). However, only 7.0% of the participants knew that early-stage cervical cancer is commonly asymptomatic [Table 2].

A total of 67.6% of the participants knew that HPV infection cannot be prevented by hygiene care alone, but only 9.7% knew that HPV infection is generally asymptomatic. Moreover, 63.2% of the participants knew that HPV vaccination can prevent HPV infection, but only 20.5% knew that HPV vaccination has no major

Table 1: Demographic characteristics of intern nurses (n=258)

Characteristics	n (%)
Gender	
Male	40 (15.5)
Female	218 (84.5)
Age (years)	
Mean (SD)	20.45 (1.77)
Median (range)	20 (16-29)
School	
Polytechnic school	45 (17.4)
Technical college	163 (63.2)
University	50 (19.4)
Place of residence	
Rural area	181 (70.2)
City	77 (29.8)

SD: Standard deviation

Table 2: Knowledge about human papillomavirus infection and cervical cancer prevention

Questions	Correct answer, n (%)	Uncertain, n (%)
1. Cervical cancer is the second most common female cancer in China (true)	164 (63.6)	59 (22.9)
2. Most cervical cancer is caused by HPV infection (true)	146 (56.6)	60 (23.3)
3. HPV infection is contracted through sexual contact (true)	153 (59.3)	40 (15.5)
4. HPV infection commonly presents with abnormal discharge, abnormal bleeding, or fever (false)	25 (9.7)	44 (17.1)
5. HPV infection can be prevented by hygiene care alone (false)	159 (67.6)	36 (14.0)
6. HPV infection can be prevented by using a condom (true)	158 (61.2)	43 (16.7)
7. HPV infection can be prevented by vaccination (true)	163 (63.2)	53 (20.5)
8. HPV vaccine induces immunity to HPV (true)	156 (60.5)	62 (24.0)
9. HPV vaccination has no major side effects (true)	53 (20.5)	102 (39.5)
10. Cervical cancer screening is not necessary among vaccinated women (false)	206 (79.8)	35 (13.6)
11. Smoking increases the risk of cervical cancer (true)	232 (89.9)	17 (6.6)
12. Having multiple sexual partners increases the risk of cervical cancer (true)	218 (84.5)	27 (10.5)
13. Sex at an early age increases the risk of cervical cancer (true)	214 (82.9)	33 (12.8)
14. Cervical cancer commonly presents with abnormal discharge or bleeding (false)	18 (7.0)	13 (5.0)
15. Cervical screening can prevent morbidity and mortality from cervical cancer (true)	227 (88.0)	13 (5.0)
16. Cervical cancer is curable if detected at an early stage (true)	210 (81.4)	27 (10.5)

HPV: Human papillomavirus

side effects. A total of 79.8% correctly acknowledged that cervical screening is still mandatory for vaccinated women [Table 2].

Regarding gender, the disagreement rate with the statement “Cervical cancer is the second most common female cancer in China,” was 2.5% for males and 15.6% for females ($P = 0.005$); additionally, 62.5% male and 83.0% female participants knew that cervical cancer screening is necessary among vaccinated women ($P = 0.006$). The participants’ place of residence affected the answers to the statement “Cervical cancer screening can prevent morbidity and mortality from cervical cancer,” with 91.7% of the participants from the rural area and 79.3% from the city knowing that it is true ($P = 0.018$). Participants from different schools showed differences in their answers to the statements “Cervical cancer is the second common female cancer in China” ($P = 0.02$), “HPV infection can be prevented by vaccination” ($P = 0.009$), and “Cervical cancer screening is not necessary among vaccinated women” ($P = 0.001$) [Table 3].

Discussion

Because the China FDA requires evidence of safety and efficacy from clinical trials among the Chinese population, after a wait of 10 years, HPV vaccination has been approved in mainland China and will be commercially available for Chinese women. According to experience in the United Kingdom, school nurses play a key role in HPV vaccination,^[19-21] and nearly 40% of people’s knowledge about HPV vaccination in China comes from doctors or nurses.^[22] Thus, intern nurses’ knowledge about HPV vaccination and cervical cancer prevention is important in the use of HPV vaccination.

Table 3: The relationship between some participant factors and the rate of correct answers

Questions	Correct answer	Incorrect answer	Do not know	P
Question 1				
Male	23	1	16	0.005
Female	141	34	43	
Question 10				
Male	25	9	6	0.006
Female	181	17	20	
Question 15				
Rural area	166	9	6	0.006
City	61	9	7	
Question 1				
Polytechnic school	34	5	6	0.02
Technical college	97	19	47	
University	33	11	6	
Question 7				
Polytechnic school	29	10	6	0.009
Technical college	107	17	39	
University	27	15	8	
Question 10				
Polytechnic school	28	4	13	0.001
Technical college	136	18	9	
University	42	4	4	

The intern nurses in this study lacked knowledge about female cancer, as 36.4% did not know that cervical cancer is the second most common female cancer in China. Nearly 50% did not know about the relationship between HPV infection and cervical cancer. However, 74%, 79.55%, and 81.8% of nurses knew about this relationship in studies conducted in Canada, Malaysia, and Thailand,^[18,23,24] respectively, and 44.4% of primary care physicians in Hong Kong.^[25] Although most participants knew other risk factors of cervical cancer, few knew that early-stage cervical cancer

is commonly asymptomatic, which was also found in a study conducted in Thailand.^[18] The reason for this situation may be a result of the nursing education system, where more emphasis is placed on acquiring nursing knowledge than on learning about disease symptoms. For the same reason, the participants may have lacked knowledge about cervical cancer prevention and screening, especially about the symptoms of HPV infection and side effects of HPV vaccination.

We also analyzed the relationship between some participant factors and the rate of correct answers. Compare to male participants, more female participants knew that “Cervical cancer is the second most common female cancer in China,” and that cervical cancer screening is necessary among vaccinated women. Other studies had similar results; a survey about HPV vaccination knowledge showed that in China, mothers were more likely to have a higher knowledge level than fathers.^[20] In a survey conducted among undergraduate freshmen and seniors in a Brazilian university, female participants were found to be more knowledgeable about HPV.^[26] More female university students stated that they also heard of HPV and HPV vaccination in a study conducted in Turkey.^[27] Females care more about the disease of themselves, and this could explain the different results between male and female participants. More participants from the city than from rural areas knew that “Cervical cancer screening can prevent morbidity and mortality from cervical cancer.” Similar differences between those in the city and rural areas also were found in other studies. One study found that women living in rural areas in Romania had reduced knowledge about the importance of the Papanicolaou test (also known as the Pap smear), early detection, and treatment of early-stage cervical cancer.^[28] Another found that one in five urban women and one in twenty rural women in Bangladesh had heard about a vaccine that can prevent cervical cancer.^[29] The participants in these studies had received the same education as those in the present study; the different results may be related to education before their nursing study.

The relationship between school type and the rate of correct answers was inconsistent. Among intern nurses from polytechnic schools, technical colleges, and universities, those from universities were the least likely to answer correctly the statements “Cervical cancer is the second common female cancer in China” and “HPV infection can be prevented by vaccination.” But regarding “Cervical cancer screening is not necessary among vaccinated women,” the rate of correct responses among intern nurses from technical colleges and universities was 83.4% and 84%, respectively, but only 62.2% for nurses from polytechnic schools. Previous studies have also yielded conflicting conclusions. A study from Southeast Turkey showed that

university students had significantly more correct responses concerning HPV knowledge than high school students.^[30] Another study had the same result: nursing interns had higher scores concerning HPV knowledge than nursing graduates,^[31] but another study showed no significant difference between high school and university students.^[32] Usually, a learning period lasts about 2, 3, and 4 years for intern nurses in polytechnic schools, technical colleges, and universities, respectively, thus, the rate of correct answers should gradually increase. The reason for this inconsistency result is not clear. In our study, intern nurses in the Chinese province of Sichuan lacked knowledge of HPV infection and cervical cancer prevention. A study in Sweden showed that a high level of education and perceived good knowledge about HPV are associated with a positive attitude toward an HPV vaccination program among school nurses,^[26] which can have a beneficial effect on the program. In the future, nurses in China will require adequate knowledge, education, skills, and time to address the questions and concerns of parents and provide information about HPV.

There are some limits to our study. First, more correct answers are true than false in the questionnaire, which may have affected the results. Second, whether the intern nurses rotate between obstetrics and gynecology could have also affected the rate of correct answers, but we did not consider it in the questionnaire.

Conclusions

Our study indicates a low level of knowledge of HPV infection and cervical cancer prevention among intern nurses in Sichuan, China. Our findings highlight the need for more education about HPV infection and cervical cancer prevention to improve intern nurses’ knowledge, who will play an important role in the use of HPV vaccination to prevent cervical cancer.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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