Knowledge, attitude, and practice on human papillomavirus vaccination among obstetrics and gynecology residents in Metro Manila*

By Katrina Immaculada F. Decena, MD and Doris R. Benavides, MD, FPOGS

Department of Obstetrics and Gynecology, Philippine General Hospital, University of the Philippines-Manila

ABSTRACT

Background: Human Papilloma Virus (HPV) has been known to be an important factor in the development of cervical cancer. In 2006, two vaccines were made available in the Philippines, one covering two subtypes (HPV 16 and 18) and the other covers four subtypes (HPV 6, 11, 16 and 18) of the virus.

Objectives: This study aimed to determine the current knowledge, attitude, and practices of obstetrics and gynecology residents from both government and private sector regarding HPV vaccination as well as determine barriers to vaccination. It also aimed to determine if there is any disparity between the private and government setting, and between residency year levels which may create a discrepancy in the vaccination coverage of their patients.

Methods: Data will be collected through a self-administered questionnaire. The survey to be used in this study was adapted from the form used in a similar study done in Hong-Kong. The questionnaire will consist of five sections: 1) items regarding the respondents' demographics (age; sex; institution type; residency training year level; number of patients seen in a typical week; number of patients seen in a week aged 10-17, 18-26, and 27-45; number of pap smears performed in a typical week), 2) Knowledge on human papillomavirus infection, 3) Attitude towards HPV vaccine, 4) HPV vaccination practice, and 5) Perceived barriers in HPV vaccination.

Results: This study found that the knowledge of residents about human papilloma virus was generally poor to fair with no significant difference between the knowledge of residents from government institutions compared to those from the private sector. Majority of the residents believe that the vaccine should be administered to 10-17 years old, prior to sexual debut and exposure to the human papilloma virus but were not able to prescribe vaccination for this age group. The perceived barriers of residents in prescribing and vaccinating their patients differ between age groups. For 10-17 years old, parental refusal for vaccinating their children is due to the notion that in doing so, their child is being singled out as being at risk for sexually transmitted diseases. For patients 18-26 years old, residents believe that their reluctance to discuss and talk about issues of sexuality are likely to hinder them from getting vaccinated. For the 27-45-year-old age group, the residents believe that the patient's belief that they do not have HPV infection is likely to hinder them being vaccinated.

Conclusion: Proper education and good communication skills among residents and patients should be developed to properly employ and promote vaccination.

Keywords: Human Papilloma Virus

INTRODUCTION

Human Papilloma Virus has been known to be an important factor in the development of cervical cancer. Several subtypes of the virus have been identified to cause the malignant transformation of the cervical epithelium, also known as the high-risk subtypes. The identification of and the development of a vaccine against these subtypes has led to the possibility of preventing some cervical cancers through vaccination.

Worldwide, cervical cancer remains one of the top malignancies ailing women. It is ranked fourth among the most common cancers in women and seventh overall. In 2012, there were 528,000 new reported cases of cervical cancer causing an estimated 266,000 deaths worldwide. It is the second most commonly diagnosed cancer and the third leading cause of death in women in the less developed countries. Approximately 90% of cervical cancer mortalities occurred in the developing parts of the world, with Asia accounting for 144,400 deaths.[1]

Among Filipino women, it is ranked second as the most common malignancy and is the most common cause

*1st Place, 2017 Philippine Obstetrical and Gynecological Society (POGS) Research Paper Contest, April 6, 2017, Citystate Asturias Hotel, Puerto Princesa City, Palawan

of cancer related mortality.[2,3] The ICO Information Center on HPV and Cancer published in June 2016 that in the Philippines, there are 6670 documented new cases with 2832 reported deaths annually.[3]

Infection with the human papilloma virus (HPV) oncogenic types, most frequently HPV 16 is the most significant risk factor in the development of cervical cancer. The International Biological Study on Cervical Cancer has shown that 93% of invasive cervical cancers had infection with HPV.[4] Reports indicate that in squamous cell carcinoma, HPV types were present in 93.8% and 90.9% in adenocarcinoma[2]. HPV infection is now considered a necessary prerequisite for the genesis of cervical cancer.[4,5] The recent understanding of the causal connection between infection and the so called highrisk or oncogenic types of HPV and cervical cancer, has led to a paradigm shift geared towards not only detection but also to the prevention of CIN and cervical cancer. Research on HPV has led to the technology for the development of candidate vaccines to prevent HPV infection and subsequently, cervical cancer.[5]

Two pharmaceutical companies have been the major players in research and development in prophylactic HPV vaccines to date.[5] Two vaccines, the bivalent, targeting HPV 16/18 and a quadrivalent, targeting HPV 6/11/16/18 have been developed. Early data from randomized control trials have consistently showed that prophylactic vaccines are effective in preventing infection and lesions caused by the targeted HPV types and thus substantially reducing HPV -related morbidity and mortality.[6] Both have undergone phase 3 trials and have been approved for sale in the US and UK since 2006. The use of either quadrivalent or the bivalent vaccine for the prevention of cervical cancer has been approved in the Philippines and has been gaining popularity among Filipinos.[2]

Long lasting protection against HPV 16 may translate into the prevention of at least half of all cervical cancers.[5] Currently, Center for Disease Control (CDC) and American College of Obstetricians and Gynecologist (ACOG) guideline states that the ideal population for vaccination are girls at age 11-12 years old prior to sexual activity. However, they also recommend giving it to girls 9-26 years old and those who have not been vaccinated.[7,8]

Published literature of studies done worldwide have shown low levels of public knowledge about HPV and its links to cervical cancer but have shown that the people are generally in favor of vaccination.

Several cross sectional studies have been undertaken in different parts of the world to examine the gynecologists', pediatricians' and other healthcare providers' knowledge, attitudes, acceptance and practices regarding the use of HPV vaccine.[13-14] These studies have demonstrated that HPV vaccine acceptability among healthcare providers is positive. However, most of the studies were done in developing countries.[14]

According to a study on HPV vaccine acceptability among Filipino women conducted last 2010, acceptance for vaccination is mostly influenced by price. In the Asia pacific region, price has been cited as a major barrier for the enactment of HPV vaccination programs. In addition, exposure to vaccine-promoting media and suggestion from health-care providers to obtain protection from genital warts, were significant influences in the acceptance of vaccination.[11] The effectiveness of HPV vaccine acceptance by the general population might be related to several factors such as price and whether or not healthcare providers advise females to be vaccinated.[12-14] In addition to this, a high rate of reception also requires accurate information from healthcare providers by answering questions from parents or patients. Thus, a good implementation of communication should reduce barriers to vaccination, and create and sustain a favorable response in the target population.[12-13] Therefore, healthcare providers play a key role in influencing the populations' acceptability of HPV vaccination and decision to be vaccinated.

One study found that for physicians, their professional organization or society recommendations were the most influential variable in recommendation of the vaccine to their patients.[15] On the other hand, another recent study showed that the strongest predictor of HPV vaccination was the type of practice of the physician, with those on private practice reporting higher vaccination rates than those in another type of practice such as ambulatory care clinics or urgent care clinics.[16]

This study aims to determine the current knowledge, attitude, and practices of obstetrics and gynecology residents from both government and private sector regarding HPV vaccination as well as pinpoint barriers to vaccination. The study will also be able to determine if there is any disparity between the knowledge, attitude and practices of residents in the private and government setting which may create a discrepancy in the coverage of their patients with the vaccine.

The results of this study could contribute to identify and address key aspects in terms of strengthening practice of HPV vaccination both in the government and private setting to be able to increase coverage.

OBJECTIVES

The general objective of this study is to determine the knowledge of, the attitude towards and the practice regarding HPV vaccination among obstetrics and gynecology residents in Metro Manila both in private and government setting.

SPECIFIC OBJECTIVES:

1. To determine the **knowledge** of obstetrics and gynecology residents regarding HPV infection.
2. To determine the **attitude** of obstetrics and gynecology residents regarding HPV vaccination.
3. To determine the **practices and perceived barriers** of obstetrics and gynecology residents regarding recommendation and administration of HPV vaccination among their patients.
4. To determine if there are **differences between the knowledge, attitude, practices and perceived barriers** regarding HPV vaccination among obstetrics and gynecology residents from private and government hospitals.
5. To determine if there are **differences between the knowledge, and practices** regarding HPV vaccination among the residency year levels.

MATERIALS AND METHODS

A. Research Design

A descriptive cross-sectional survey design will be used to determine the level of knowledge of obstetrics and gynecology residents in Metro Manila regarding HPV infection, as well as their attitude towards vaccination against HPV infection. A descriptive study design will also be used to determine the percentage of OB GYN residents who recommend and administer HPV vaccination including the perceived barriers in giving the vaccine.

B. Study Cohort

Inclusion Criteria

The study population will include board certified physicians currently undergoing obstetrics and gynecology residency training in the different training hospitals in Metro Manila.

Exclusion criteria

1. Residents who are involved in research on HPV Vaccination, as this may give them undue advantage of having extra knowledge regarding the topic.
2. Residents who have ties with any of the two manufacturers of the HPV vaccine which will create bias in the recommendation and practice of HPV vaccination.

C. Sample Size

For 2016, there are 550 residents undergoing obstetrics and gynecology training in accredited hospitals in Metro Manila. Using a conservative and pioneering survey response or turn out rate of 50%, allowing +/-6.7% margin of error estimated at CI 95%, then, this study will need a minimum of 154 respondents in order to represent the 550 total population of residents undergoing obstetrics and gynecology training in accredited hospitals in Metro Manila.

A list of Metro Manila hospitals with accredited obstetrics and gynecology training program will be obtained from the Philippine Obstetrics and Gynecology Society. Multi-stage cluster sampling will be used in determining the hospitals whose residents will be asked to participate in the study. The hospitals will be clustered according to their location, by city (example: Manila, Quezon City, Pasay City, Makati City, Valenzuela, Caloocan, Pasig, Muntinlupa, Marikina, San Juan). In alphabetical order of the name of the hospitals per cluster, all the residents from the first two of every three hospitals will be included in the study (example: Manila- H1, H2, H3, H4, H5, H6 study will include H1,H2, H4, H5).

D. Materials and Methods

Data will be collected through a self-administered questionnaire.

The survey to be used in this study was adapted from the form used in a similar study done in Hong-Kong. The survey was designed by an academic physician and validated by an expert panel consisting of epidemiologists, public health specialists, family physicians, microbiologists and academic professionals. The survey was pilot tested by 20 physicians for face-validity and comprehensibility.

The questionnaire will consist of five sections: 1) items regarding the respondents' demographics (age; sex; institution type; residency training year level; number of patients seen in a typical week; number of patients seen in a week aged 10-17, 18-26, and 27-45; number of pap smears performed in a typical week), 2) Knowledge on human papillomavirus infection, 3) Attitude towards HPV vaccine, 4) HPV vaccination practice, and 5) Perceived barriers in HPV vaccination.

Questions that address the attitude of the participants towards HPV vaccination and the perceived barriers in vaccination are close-ended with possible responses including "extremely important", very important", "important", "somewhat important", and "not at all"

All data gathered from the respondents will be treated as confidential information.

E. Description of the study procedure

Data will be collected through a self-administered questionnaire.

The researcher will send a letter of request to the chairperson and the chief resident of the Department of Obstetrics and Gynecology of each hospital for permission

to conduct the study in their institution, and meet with them personally. Once allowed to conduct the study, the questionnaires will be distributed and will be collected after 5-7 days.

F. Definition of the Outcomes

This study would investigate the following outcomes of interest:

1. Level of knowledge regarding HPV infection among obstetrics and gynecology residents in Metro Manila will be computed by the obtaining the number of participants that answered the items correctly, divided by the number of items, and multiplied by 100.

2. A positive or negative attitude towards HPV Vaccination of obstetrics and gynecology residents in Metro Manila will be computed by taking the number of participants that answered 1, for "Not at all important"; 2, somewhat important'; 3, "important"; 4, for "very important" or 5, for "extremely important" for each of the items, divide by number of participants multiplied by 100.

3. Practice regarding HPV vaccination among obstetrics and gynecology residents in Metro Manila will be computed by obtaining the tally of participants who answered the corresponding choices of each item, divide by the number of participants who answered each item, multiplied by 100. Mean scores will also be computed and grouped as follows: 1-2.33 "negative", 2.34-3.67 "neutral" and 3.68-5 "positive"

4. Perceived barriers of obstetrics and gynecology residents in Metro Manila to vaccination of patients will be computed by obtaining the tally of participants who answered the corresponding choices of each item, divide by the number of participants who answered each item, multiplied by 100

G. Data analysis

Data will be entered and analysed using the IBM-Statistical Package for Social Sciencesver 21. Descriptive statistics, frequencies and percentages will be calculated for each item in the questionnaire. Knowledge will be presented in the form of frequency and percentage in each item while the overall knowledge will be presented by mean and standard deviation. Attitude assessment will be categorized on a 5-level Likert scale that ranges from 1, for "Not at all important" to 5, for "extremely important". Each item of attitude will be presented in percentage, mean and standard deviation. Level of attitude will be calculated by mean scores and grouped as follows: 1-2.33 "negative", 2.34-3.67 "neutral" and 3.68-5 "positive". The practices and perceived barriers will be presented as frequency and percentage.

To test whether there are significant overall average differences between obstetrics and gynecology residents from private and government hospitals' knowledge, attitude, practices and perceived barriers regarding HPV vaccination, Chi-square test with appropriate contingency tables will be utilized.

To determine if there are differences in the knowledge and practices regarding HPV vaccination as stratified by the respondents' residency year levels, One-way analysis of variance will be performed. Also, associations between respondents' year level and their categorical levels knowledge, and practices regarding HPV vaccination will be tested using Chi Square test of independence with correspondents' contingency tables.

Any associated p-values lesser than 0.05 alpha will be considered significant.

H. Ethical Considerations

The protocol for this research will be submitted to the University of the Philippines-Manila Research Ethics Board (UPMREB) PGH Review Panel, and the commencement of data gathering will begin after approval by the board is obtained.

Informed consent will be obtained from the participants invited to accomplish the survey. The informed consent form will be in English because it is assumed that all the study subjects have a good grasp of the English language. Demographic and personal information will be kept confidential. The names of the participating obstetrics and gynecology residents will not be disclosed during the reporting of the study.

The study has no direct benefit to the participants but this study may help determine the knowledge, attitude and practice regarding HPV vaccination. This will be able to aid the Department of Health and the Philippine Obstetrics and Gynecology Society in their efforts to improve HPV vaccination coverage in the country.

The investigators will strictly observe the following:

1. Personal information and research data collected from each subject will be kept confidential. Their names will not appear in the analysis and reporting of the study.

2. The investigators will relay correct and factual results.

3. All sources of information, journals, publications and unpublished studies will be provided for review.

I. Disclosure of Conflict of Interest

The investigators are not affiliated with any organization, committee or company that could affect the results and conclusions of the study. They also have co competing financial interest that could reasonably be viewed as a conflict of interest.

J. Risk and Benefits

The study has no direct benefits to the participants but may assist the Department of Health and Philippine Obstetrics and Gynecology Society in their efforts to increase HPV vaccination coverage. There are no perceived risks for the participants as the investigators will keep all their answers confidential so as not to affect their training, practice and social standing.

The participants will not be receiving any form of incentive or compensation for taking part in this research.

RESULTS

This study was conducted in October 2016. A total of 157 residents have been surveyed and have completed the questionnaire. Mean age of respondents is 29.16 years old (SD + 2.49). The majority of the residents were females at ninety-two percent (92%) and eight percent (8%) were males. Seventy-three percent (73%, n= 114) of the respondents were from government hospitals and twenty-seven percent (27%, n= 43) from private hospitals. More than half or 59.2%, of the surveyed residents see an average of 41-50 patients in a typical week. By age group of patients, majority or fifty-eight percent (58%) of the residents surveyed do not have patients aged 9-17 years old, sixty percent (60%) see around 10-20 patients aged 18-26 years old, and forty-five percent (45%) see around 10-20 patients aged 27-45 years old. Most of the surveyed residents, 41%, perform an average of 6-10 pap smears per week while 33.9% only perform 1-5 pap smears per week (Table 1).

Knowledge

Knowledge among residents regarding the Human Papilloma Virus was poor to fair. Majority, 33%, have fair knowledge getting 50-60% of the questions right while twenty-seven percent (27%) had poor knowledge getting less than 50% of the questions right. Only 17% of the residents were able to answer more than 3 questions correctly. Less than half (47.8%) of the population was able to determine the correct prevalence of HPV infection in sexually active adolescents and young women, and less than half (28.7%) know the prevalence of genital warts in sexually active adolescent and young women. However, more than half (55.4%) know that 75-100% of cervical cancers are caused by infection with HPV, and a high

Table 1. Characteristics of the Study Population

Respondents' profiles	Descriptive [n=157]	
Age, years mean[sd]	29.16	±2.49
Gender		
M	13	8.3
F	144	91.7
Residency year level		
1	24	15.5
2	41	26.1
3	45	28.6
4	47	29.8
Institution		
Private	43	27.4
Government	114	72.6
Number of patients seen in a typical week		
1-10	13	8.3
11-20	27	17.2
21-30	4	2.5
31-40	20	12.7
41-50	93	59.2
Aged 9-17		
10-20	91	58.0
30-40	43	27.4
50-60	11	7.0
70-80	2	1.3
90-100	2	1.3
None	8	5.1
Aged 18-26		
10-20	35	22.3
30-40	95	60.5
50-60	20	12.7
70-80	2	1.3
90-100	5	3.2
Aged 27-45		
10-20	33	21.0
30-40	70	44.6
50-60	36	22.9
70-80	14	8.9
90-100	4	2.5
Number of pap smears performed in a typical week		
1-5	36	22.9
6-10	64	40.8
11-15	33	21.0
16-20	24	15.3

percentage (96%) of the residents were able to determine the disease caused by the 4 most common HPV subtypes – HPV 6 and 11 causing genital warts and HPV 16 and 18 causing cervical carcinoma.

There is a significant association between the respondents' year level and level of knowledge. Ten of 24 first year residents had fair knowledge, 14 of 41 second year residents had poor knowledge, 14 of 45 third year residents had fair knowledge, as well as 16 of 47 fourth year residents had fair knowledge. Third year and fourth year residents had higher proportion of those with average and high levels of knowledge compared to the rest of the year levels. This association implies that higher level of knowledge is associated with the higher level of residency training of the respondents ($p<0.001$).

On the other hand, among 43 respondents from the private institution, 14 had average knowledge, while from the government sector 39 out of 114 had fair level of knowledge. This showed that the association between the type of institution where the residents are training, whether private or government, and their level of knowledge was not statistically significant ($p=0.196$).

Attitude

The surveyed residents identified the most important factors that they consider when prescribing HPV vaccination across all age groups (10-17, 18-26, and 27-45 years old) as: (1) the ability of the vaccine to be efficient in demonstrating reduction in cervical intraepithelial lesions, (2) vaccination leading to long lasting immunity and (3) the vaccines' ability to protect against genital warts or condylomata. It was also important to the residents that recommendation of vaccination is able to provide them with a venue to discuss sexuality issues with the patients. It was equally an important factor to consider for the respondents that the vaccines are available at a reasonable price. For age group 10-17 years, the vaccines' ability to eliminate the need for future annual pap smears and eliminating the increase in the likelihood of their patients having sex are only of neutral importance among the residents (Table 2).

In the assessment of respondents' attitude, none of the attitude indicators for patients 10-17 years old, 18-26 years old, and 27-45 years old differ significantly when stratified by the respondents' year level of residency. Thus, respondent's attitude towards vaccination were not influence by their year level of residency.

The residents deemed that HPV vaccination is as equally important as the other vaccines such as the vaccines for genital herpes (56.1% of respondents), hepatitis B (65% of respondents), chlamydia 55.4% of respondents), tuberculosis (59.9 % of respondents), influenza (48.4% of respondents) and chickenpox (50.3% of respondents).

In assessing towards the attitude on Genital Herpes, Hepatitis B, Chlamydia, Tuberculosis, Influenza, Chickenpox, and ideal age range for HPV vaccination, the attitude of the respondents were also not influenced by their residency year level.

Majority, 62.4%, of the residents think that the ideal age range for vaccination is 10-17 years old while, 36.3% think that the ideal age would be 18-26 years.

Practices

In the past 3 months, more than half of the residents, 55% and 60.5%, were able to prescribe HPV vaccination to an average of 1-25 patients aged 18-26 years old and 27 years and older, respectively. On the other hand, for patients aged 10-17 years, majority of the residents (63.7%) did not prescribe HPV vaccination.

The quadrivalent vaccine was the popular choice of vaccine at 91.1%, amongst residents. There were, 7.5% (n=12) of the respondents that did not have any preference. The most important influences for choice of vaccination were: (1) due to the broader coverage of HPV subtypes (59.2%), (2) a perceived lower price of the vaccine (31.8%), (3) ability to protect against genital warts (28.7%), (4) safety profile (28.7%) and (5) ability to infer stronger protection (27.4%).

Among the indicators of practices, it was shown that higher proportion of third and fourth year level residents' choice of vaccine was based on perceived safety ($p=0.031$) and according to patients' choice ($p=0.025$). This implies that higher residency level promotes higher practices towards the said indicators.

In comparison, residents from government hospitals significantly recommended HPV vaccination to a lesser number of their 18-25 year old clients compared to residents from private hospitals, at 25 patients or less in the past 3 months ($p<0.001$).

Barriers to Vaccination

For the perceived barriers to prescribing HPV vaccination, the residents identified several factors that might hinder their ability to immunize their patients.

For patients aged 10-17, 40.1% of the residents perceived that the parents will somewhat likely refuse to have their children be immunized with HPV vaccine because they think that their child is being singled out be at risk for an STD. Almost thirty-seven (36.9%) percent of the residents also believe that the parents' concern regarding the vaccine's safety is a barrier to immunization. Other perceived barriers to immunization include: (1) the parents think that their child is receiving too many vaccinations already (33.8%), (2) the parents pay less attention to vaccination of their children once they are over 5 years old (35.7%), and (3) the parents' reluctance to have their

Table 2. Attitude of obstetrics and gynecology residents HPV vaccination of patients 10-17 years old, 18-26 years old, and 27-45 years old

Attitude	10-17 yr old	
	Mean	Std. Deviation
Would be efficient (demonstrating reduction in cervical intraepithelial lesions)	4.52	0.64
Would not cause adverse effects	4.27	0.75
Would also protect against condylomata (genital warts)	4.51	0.60
Would allow patients to receive other vaccines at the same visit	4.11	0.93
would lead to long lasting immunity	4.36	0.83
Would eliminate the need for future annual Pap tests	3.60	1.31
Would not increase the likelihood of my patients having sex	3.58	1.26
Would not decrease condom use in my patients	3.82	1.20
Would provide an opportunity for me to discuss sexuality issues with my patients	4.52	4.17
Would have regulatory approval from local authority for the client's age	3.92	1.15
Would have regulatory approval in other countries for the client's age	3.97	1.15
Would be available at a reasonable price	4.39	0.88
Attitude	**18-26 yr old**	
	Mean	**Std. Deviation**
Would be efficient (demonstrating reduction in cervical intraepithelial lesions)	4.55	0.61
Would not cause adverse effects	4.26	0.78
Would also protect against condylomata (genital warts)	4.47	0.71
Would allow patients to receive other vaccines at the same visit	4.17	0.97
would lead to long lasting immunity	4.30	0.94
Would eliminate the need for future annual Pap tests	3.82	1.28
Would not increase the likelihood of my patients having sex	3.78	1.27
Would not decrease condom use in my patients	3.79	1.19
Would provide an opportunity for me to discuss sexuality issues with my patients	4.20	0.89
Would have regulatory approval from local authority for the client's age	4.06	0.99
Would have regulatory approval in other countries for the client's age	4.06	1.01
Would be available at a reasonable price	4.33	0.81
Attitude	**27-45 yr old**	
	Mean	**Std. Deviation**
Would be efficient (demonstrating reduction in cervical intraepithelial lesions)	4.51	0.67
Would not cause adverse effects	4.34	0.67
Would also protect against condylomata (genital warts)	4.50	0.63
Would allow patients to receive other vaccines at the same visit	4.18	0.93
would lead to long lasting immunity	4.28	0.89
Would produce similar antibody response as observed in young adults	4.24	0.79
Would eliminate the need for future annual Pap tests	3.82	1.27
Would not increase the likelihood of my patients having sex	4.11	4.26
Would not decrease condom use in my patients	3.89	1.16
Would provide an opportunity for me to discuss sexuality issues with my patients	4.11	0.96
Would have regulatory approval from local authority for the client's age	4.08	1.02
Would have regulatory approval in other countries for the client's age	4.03	1.02
Would be available at a reasonable price	4.35	0.82

Table 3. Barriers to vaccination of patients aged 10 -17 years old

Barrier - 10-17 years old	extremely unlikely		somewhat unlikely		neither		somewhat likely		extremely likely	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
too many vaccines	16	10.2	27	17.2	44	28	53	33.8	17	10.8
safety of the vaccine	1	0.6	40	25.5	48	30.6	58	36.9	10	6.4
don't believe in vaccines	16	10.2	22	14	62	39.5	34	21.7	23	14.6
pay less attention to vaccination status once child is over 5 years of age	7	4.5	34	21.7	50	31.8	56	35.7	10	6.4
reluctance to have their children immunzed against STD	6	3.8	40	25.5	34	21.7	53	33.8	24	15.3
reluctance to discuss issues of STI	18	11.5	49	31.2	30	19.1	42	26.8	18	11.5
singling out their child as one who is at risk for an STD	16	10.2	32	20.4	25	15.9	63	40.1	20	12.7
increase risky behavior	18	11.5	28	17.8	50	31.8	38	24.2	21	13.4
Time pressure during well child visit	20	12.7	28	17.8	39	24.8	51	32.5	19	12.1
recommendations change too often	25	15.9	51	32.5	40	25.5	32	20.4	9	5.7
reluctance to administer multiple vaccines	21	13.4	36	22.9	47	29.9	31	19.7	22	14
reluctance to tallk to adolescents about issues of sexuality and STI	18	11.5	43	27.4	39	24.8	35	22.3	22	14
Acquisition and administration cost	22	14	44	28	41	26.1	34	21.7	16	10.2
ability to get older children to show up for well visits	4	2.5	33	21	39	24.8	54	34.4	26	16.6

Table 4. Barriers for vaccination of patients aged 18-26 years old

Barrier - 18-26 years old	extremely unlikely		somewhat unlikely		neither		somewhat likely		extremely likely	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Need to pay vaccines	3	1.9	46	29.3	45	28.7	29	18.5	34	21.7
safety of the vaccine	10	6.4	39	24.8	50	31.8	42	26.8	16	10.2
doesn't believe in vaccines	12	7.6	14	8.9	65	41.4	40	25.5	26	16.6
doesn't believe she will have cervical cancer	20	12.7	33	21	58	36.9	37	23.6	9	5.7
Doesn't believe she will have HPV	17	10.8	37	23.6	51	32.5	34	21.7	18	11.5
reluctance to be immunized against an STD	27	17.2	47	29.9	48	30.6	28	17.8	7	4.5
Reluctance to discuss issues of sexuality	26	16.6	29	18.5	39	24.8	51	32.5	12	7.6
Singling her out as one who would be at risk for an STD	29	18.5	29	18.5	51	32.5	32	20.4	16	10.2
Time pressure during a well visit	29	18.5	40	25.5	59	37.6	24	15.3	5	3.2
Reluctance to talk about issues of sexuality	30	19.1	29	18.5	44	28	46	29.3	8	5.1
Acquisition and administration cost of another vaccine	30	19.1	30	19.1	53	33.8	30	19.1	14	8.9

children immunized against sexually transmitted diseases (33.8%). The residents also feel that time pressure during well child visits (32.5%) and their ability to get older children or adolescents to come in for a well visit (34.4%) are somewhat likely to hinder their ability to vaccinate patients within this age group (Table 3).

For patients 18-26 years old, 32.5% and 29.3% of residents believe that their reluctance to discuss and talk about issues of sexuality are somewhat likely to hinder them from prescribing HPV vaccination, respectively. The rest of the issues were only deemed to be neither likely or unlikely to prevent them from immunizing their patients (Table 4).

For the 27-45 year-old age group, 29.3% of the residents believe that the belief of patients that they do not have HPV infection somewhat likely to hinder them from prescribing HPV vaccination. Almost thirty percent (29.9%) of the residents believe their reluctance to discuss issues of sexuality, while 28% believe that the added burden of acquisition and administration cost of another vaccine are all somewhat likely to hinder them from prescribing HPV vaccination. The rest of the issues were only deemed to be neither likely or unlikely to prevent them from immunizing their patients (Table 5).

Comparing residents from the private hospitals and residents from government hospitals, there are no significant differences in their perceived barriers for vaccination of patients at ages 10-26 years old. However, for their patients aged 18-26 years old, residents from government hospitals had higher ratings on the barrier of "not believing in vaccines" than those in the private setting (3.48 vs 2.98, p=0.009). For patients aged 27-45 years old, residents in government setting had higher ratings on the barrier of "reluctance in discussing issues of sexuality"(2.81vs 2.35, p=0.030).

DISCUSSION

This study found that the knowledge of residents about human papilloma virus was generally poor to fair. There was no significant difference between the knowledge of residents from government institutions compared to those from the private sector although relating between year levels, the knowledge of senior residents (3rd and 4th years) were significantly higher. The knowledge on HPV prevalence was indeed low yet, the knowledge on the role of the HPV types in cervical cancer and genital warts was high. The residents were able to identify that HPV types 6 and 11 are responsible for genital warts while types 16 and 18 are the high risk types – associated with cervical carcinoma. In comparison with international data involving obstetrics and gynecology specialists, the resident's knowledge on the etiologic agents were at par with theirs. On the other hand, compared to studies that involved general practitioners and physicians from other specialties who have shown that they have low knowledge regarding the etiology of cervical cancer, the residents surveyed had a higher level of knowledge[10].

Table 5. Barriers for vaccination of patients aged 27-45 years old

Barrier - 27-45 years old	extremely unlikely		somewhat unlikely		neither		somewhat likely		extremely likely	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Need to pay vaccines	13	8.3	32	20.4	47	29.9	45	28.7	20	21.7
safety of the vaccine	12	7.6	38	24.2	55	35	45	28.7	7	4.5
doesn't believe in vaccines	12	7.6	17	10.8	72	45.9	42	26.8	14	8.9
doesn't believe she will have cervical cancer	16	10.2	27	17.2	59	37.6	50	31.8	5	3.2
Doesn't believe she will have HPV	15	9.6	33	21	45	28.7	46	29.3	18	11.5
reluctance to be immunized against an STD	26	16.6	50	31.8	45	28.7	30	19.1	6	3.8
Reluctance to discuss issues of sexuality	24	15.3	33	21	40	25.5	47	29.9	13	8.3
Singling her out as one who would be at risk for an STD	22	14	43	27.4	48	30.6	28	17.8	16	10.2
Time pressure during a well visit	16	10.2	40	25.5	49	31.2	34	21.7	18	11.5
Reluctance to talk about issues of sexuality	30	19.1	40	25.5	49	31.2	26	16.6	12	7.6
Acquisition and administration cost of another vaccine	22	14	30	19.1	44	28	44	28	17	10.8

The residents regarded HPV vaccination to be equally important for adolescent women's health same as with other vaccines such as for genital herpes, hepatitis B, chlamydia, tuberculosis, influenza and chicken pox. Majority of the residents also believe that the vaccine should be administered preferably at the age range of 10-17 years old, prior to sexual debut and exposure to the human papilloma virus. However, a number of the surveyed residents were not able to prescribe vaccination for this age group probably owing to the fact that majority of them are also not able to see patients within this age bracket. A number of the residents also believe that the 18-26 year old population should likewise be vaccinated against human papilloma virus. Both ideals are in keeping with the recommended age group to receive HPV vaccination by the CDC and other governing bodies which is 9-26 years old.[7,8]

The quadrivalent vaccine was the preferred vaccine with the major factors for choice being (1) the ability of the vaccine to be efficient in demonstrating reduction in cervical intraepithelial lesions, (2) vaccination leading to long lasting immunity and (3) the vaccines' ability to protect against genital warts or condylomata.

The perceived barriers of residents in prescribing and vaccinating their patients differ between age groups.

For the younger age group (10-17 years old), parental refusal for vaccinating their child or children is due to the notion that in doing so, their child is being singled out as being at risk for sexually transmitted diseases. Parents are also concerned regarding safety of the vaccine. According to a survey among pediatricians, they anticipated that emphasizing cervical cancer prevention more strongly than other vaccines may lessen concerns about vaccine acceptance. Research indicated that parental resistance to HPV vaccination is linked to their concern that this would promote risky sexual behavior. However, it is impossible to evaluate whether those who are vaccinated against HPV will participate in a riskier behavior.[17]

On the other hand, for patients 18-26 years old, residents believe that their reluctance to discuss and talk about issues of sexuality are somewhat likely to hinder them from vaccinating their patients.

For the 27-45 year-old age group, the residents believe that the patient's belief that they do not have HPV infection somewhat likely to hinder them from prescribing HPV vaccination. Similar to a study conducted in China, the most common arguments against vaccination included worries about the safety of the vaccine and low perceived personal risk for cervical cancer. Both concerns should both be responsive to education efforts.[18]

In comparison with other studies siting cost of vaccine, provider's and parental concerns regarding safety and efficacy, and communication related to sexuality as barriers of HPV vaccine prescription, these are also shown in our study to be major barriers.[10] Healthcare practitioners provide patients with important information, and parents value advice about preventive measures, such as vaccines. Since obstetrician – gynecologists are not able to see patients within the 10-17-year age bracket the responsibility of vaccinating this population falls upon Pediatricians. Therefore, efforts pertaining to HPV vaccination should not only involve obstetrician–gynecologists, but also Pediatricians and Family Physicians as well. One study found that women with higher levels of HPV knowledge were significantly more open to vaccination for both themselves and their daughters which reinforces the importance of public education in the success of an HPV vaccination program.[18] Unfortunately, counselling of patients also seemed to be a concern among healthcare workers. This could be due to time constraints, the inability to discuss the merits of the vaccine with adolescents and their parents, cost issues, or simply that even tough healthcare workers are aware that a HPV vaccine exists, they are not counselling patients about it.[13] The HPV vaccination programme's success relies largely on healthcare providers' willingness and ability to recommend vaccination against HPV to their patients as well as effective education regarding HPV and HPV vaccine.

CONCLUSION

Our study has shown that more educational initiatives should be organized for both government and private obstetrics and gynecology residents to enhance their perceived importance of prescribing HPV vaccine to their patients. There should be focus on the epidemiology of HPV infection and genital wart. Educational initiatives should emphasize the ability of the HPV vaccine to achieve strong protection and long lasting immunity, as well as its ability to have cross protection against the important oncogenic subtypes which has been perceived by our respondents as important factors in their choice of vaccine.

For barriers that hinder effective vaccination of children, since parental refusal is due to concerns regarding safety and concerns of their children being singled out as having STD, parents would be particularly reassured about the low rates of adverse effects and the vaccine's many health benefits. Likewise, good communication skills among residents should be developed to allay concerns on discussing sexuality and sexuality transmitted diseases from the older age group. To enhance vaccine uptake rate among women, the government should consider at least partial subsidy to eligible clients to overcome vaccine cost which is one of the important barriers.

In light of the present findings, future research can evaluate interventions which could effectively enhance residents' as well as the target populations' knowledge regarding HPV vaccination and if there will be improvement

in the uptake of the vaccines among the target population after enhancing their knowledge.

LIMITATIONS OF THE STUDY

To our knowledge, this is the first study to evaluate the knowledge, attitude, practices and perceived barriers towards HPV vaccination among obstetrics and gynecology residents from both private and government institutions in Metro Manila.

The primary limitation of this study is that the actual uptake of the vaccine was not studied. Correlates with healthcare providers' practices and attitude towards vaccination may be dissimilar to those of uptake. ■

REFERENCES

1. Torre, Lindsey A. MSPH, Freddie Bray PhD, et. Al. Global cancer statistics, 2012. CA: *A Cancer Journal for Clinicians*. March/April 2015. Vol 65. Issue 2. Pg 87-108.
2. Domingo, Efren J. MD, Ana Victoria V. Dy Echo, MD. Epidemiology, prevention and treatment of cervical cancer in the Philippines. *Journal of Gynecologic Oncology*. March 2009. Vol 20. No 1: 11-16.
3. ICO Information Center on HPV and Cancer Fact sheet 2016. Institut Catala d'Oncologia.
4. Walboomer, Jan M.M. , Marcel V. Jacobs, et.al. Human Papilloma Virus is a necessary case of invasive cervical cancer worldwide. *Journal of Pathology*. 1999. 189: Pg 12-19.
5. Franco, Eduardo L. and Diane M. Harper. Vaccination against human papillomavirus infection: a new paradigm in cervical cancer control. Vaccine 23. 2005. Pg 2388-2394.
6. Koutsky, Laura A. and Diane M. Harper. Chapter 13: Current findings from prophylactic HPV vaccine trials. Vaccine 21. August 2006. Vol 24: S114-S121.
7. American College of Obstetrics and Gynecology. Committee Opinion: Human Papillomavirus Vaccination. Number 641. Sept 2015.
8. Center for Disease Control and Prevention. Fact Sheet: HPV Vaccine information for young women.
9. Aljuwaihel Anoud, Alaa Al-Jaralla, et al. Awareness of HPV and Cervical Cancer vaccine among PHC Physicians in Kuwait. *Greener Journal of Medical Science*. 2012.
10. Wong, Martin C.S., Albert Lee, et al. Knowledge, Attitude, Practice and Barriers on Vaccination against Human Papillomavirus Infection: A Cross Sectional Study among Primary Care Physicians in Hong-Kong. PLOS ONE. August 2013. Vol 8. Issue 8.
11. Young, April M., Richard A. Crosby, et. al. HPV Vaccine Acceptability among Women in the Philippines. *Asian Pacific Journal of Cancer Prevention*. Vol 11. 2010.
12. Voidazan, Septimiu, Monica Tarcea, et al. Knowledge Practices and Barriers to Vaccination Against Human Papillomavirus Infection: Addressing a group of Doctor in Romania. Management in Health XIX. 3/2015. Pg 32-37.
13. Allie, Naseera. Knowledge awareness and utilization of the human papillomavirus vaccine in Durban. *South African Journal of Gynecologic Oncology*. Vol 14. No 1. 2012. Pg 6-10.
14. Songthap, Archin, Punnee Pitisuttihtum, et a. Knowledge, attitudes and acceptance of a human papillomavirus vaccine among healthcare providers. *Southeast Asian Journal on Tropical Medicine and Public Health*. Vol 40. No 5. September 2009. Pg 1048-1056.
15. Raley, Janice C., Kristen A. Followwill, et al. Gynecologists' attitudes regarding human papilloma virus vaccination: a survey of Fellows of the American College of Obstetrics and Gynecologists. *Infectious Disease in Obstetrics and Gynecology*. 2004. 12: Pg 127-133.
16. Vadaparampil, Susan T. PhD. Stephanie A.S. Staras, PhD. Et al.Provider Factors Associated with Disparities in Human Papillomavirus Vaccination Among Low-income 9- to 17- year old girls. Cancer. 2013; 119: Pg 621-628.
17. Daley, Matthew F. MD. et. al. A National Survey of Pediatrician Knowledge and Attitudes Regarding Human Papillomavirus Vaccination. Pediatrics. Volume 118. Number 6. December 2006. Pg.2280-2289.
18. Fang-Hui Zhao, et al. A multi-center Survey of HPV Knowledge and Attitudes Toward HPV Vaccination among Women, Government Officials, and Medical Personnel in China. *Asian Pacific Journal of Cancer Prevention*. Vol 13. 2012. Pg 2369-2378.