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Original Research Article

Knowledge, attitudes and practices on human papilloma virus infection, screening and vaccination among reproductive-aged women

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ABSTRACT

Background: Cervical cancer is the most common gynecological cancer and the most preventable cancer among women. 93% of cervical cancers had infection with HPV. This study aims to evaluate the factors towards practices and perceived barriers of reproductive aged women on HPV infection, vaccination and screening by looking into demographic variables, knowledge and attitudes of respondents towards HPV infection, vaccination and screening.
Methods: This research is a descriptive cross sectional study, approved by the Research Ethics Committee. A self-administered questionnaire created by the researchers and validated by three specialists was used in assessing the knowledge, attitudes, practices and barriers towards HPV infection, screening and prevention. Descriptive statistics were used to summarize the data sets. Chi square test of association was used to analyze the association of age, knowledge, attitude to the history of screening and vaccination and general practices of respondents regarding HPV infection, screening and prevention.
Results: Between August and November 2020, 81 women participated in the study. Results shows that respondents have poor knowledge (Mean: 8.74; Ref: ≥13) but with positive attitude (M: 3.13) towards HPV infection, screening and vaccination. Majority of respondents did not undergo any screening procedure (70.4%) nor received HPV vaccination (92.6%). Although, respondents had generally good practices that prevents HPV infection. Marital status and age were found to be associated with HPV infection prevention practices. However, knowledge on screening and vaccination was not associated with demographic variables.
Conclusions: This study shows that knowledge on HPV infection, screening and vaccination was generally poor. Majority of respondents have not undergone screening tests or vaccination. Major reasons identified for this are feelings of anxiety, inability to communicate desire to get screened, cost of vaccine and lack of information. Hence, information dissemination and counselling regarding the disease, its screening and vaccination should be strengthened.

Keywords: Attitudes, Cervical cancer, HPV infection, HPV screening, HPV vaccination, Knowledge, Practices

INTRODUCTION

Cervical cancer remains to be the most common gynecological cancer; however, it also remains to be the most preventable cancer among women.[1] Globally, cervical cancer ranks to be one of the most common malignancies ailing women just next to breast cancer. Regional wise, aggregate data from Asian countries revealed that cervical cancer is the third leading cause of death among women accounting to 144, 400 reported deaths annually.[2] Finally, in developing countries such as the Philippines, the burden of cervical cancer is compounded by the fact that more than 85% of all cases globally are diagnosed among women from these areas.[1] True enough, current estimates of cervical cancer among women in the Philippines indicate that 6, 670 women are diagnosed with cervical cancer and 2, 832 women die from the disease on a yearly basis.[3] In Baguio General Hospital

and Medical Center, an increasing trend of cervical cancer cases was evident from 2015, 2016 and 2017 with 109, 128 and 202 cases respectively.[4] The etiology of cervical cancer remains to be highly associated to infection to specific oncogenic strains of human papilloma virus (HPV). The International Biological Study on Cervical Cancer has shown that 93% of invasive cervical cancers had infection with HPV.[2] Also, reports indicated that in other subtypes of cervical malignancies such as squamous cell carcinoma and adenocarcinoma, oncogenic HPV types were present in 93.8% and 90.9% of cases respectively.[5]

Thus, these pieces of evidence support the claim that HPV infection is the single most important requisite to cervical cancer development. Among the oncogenic strains of HPV, the most frequently implicated to cause cervical cancer is HPV 16. In the Philippines, it was determined that about 2.9% of women in the general population are estimated to harbor cervical HPV-16/18 infection at a given time and 61.0% of invasive cervical cancers are attributed to HPVs 16 or 18.[3] Considering the wide distribution of oncogenic variants of HPV among women in the Philippines, this now establishes the necessity to seek for preventing cervical cancer among Filipino women.

Luckily, the recent understanding of the causal connection between infection and the so called high-risk 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 Cervical Intraepithelial Neoplasia and cervical cancer.[2] This includes the use of appropriate screening and prevention techniques for cervical cancer. In terms of screening the early onset of cervical cancer, the use of the Papanicolaou test, which is also known as pap smear, remains to be the most cost-effective and efficient screening method. On the other hand, research on HPV has led to the technology for the development of vaccines to prevent HPV infection and subsequently, cervical cancer. HPV vaccination has been available since 2006 for females and for males since 2009 and is currently recommended for girls and boys aged 11-12, with catch up vaccination for girls up to age 26 and boys up to age 216.

Despite the advocacy of the Philippine Department of Health on the use of such cervical cancer screening, the 2001/2002 WHO Health survey reported that only 7.7% of Filipino women belonging to 18-69 years of age avail of the said service.[5] Also, despite the recommendations and campaign for wider vaccination, there has been only a small increase in vaccine uptake among adolescents, while overall coverage remains low as compared to other recommended vaccines by health authorities.[6]

Given these intensified campaigns regarding pap smear and HPV vaccine, there is a clear barrier towards the acceptance and use of such medical techniques and procedures among our target population, hence, the need to study the knowledge, attitude and practices among women regarding such practice to adequately create programs towards the promotion of such. Increasing the understanding of how common and widespread the HPV infection may reduce the anxiety and confusion among individuals diagnosed with HPV. Prevention of HPV would therefore reduce the incidence of a number of cancers as well as genital warts along with the morbidity, mortality and costs associated with these diseases.[7]

This study aims to evaluate the factors towards practices and perceived barriers of reproductive aged women on HPV infection, vaccination and screening by looking into demographic variables, knowledge and attitudes of respondent towards HPV infection, vaccination and screening among reproductive aged women. This study will test the applicability of the tool in evaluating the knowledge, attitudes and practices of reproductive aged women regarding HPV infection, screening and vaccination. Since increased awareness regarding HPV leads to increased intent to screen and vaccinate, the results of this study could highlight possible gaps in knowledge that can be the target for future information campaigns.

The results of this study could also contribute in identifying and addressing key aspects in terms of strengthening practices of HPV screening and vaccination in order to increase coverage. Such data would also be useful for the development of appropriate strategies for increasing the receptivity of consumers towards HPV screening and vaccination thus reducing the morbidity and mortality associated with the disease. This study will also provide data for the possible inclusion of HPV screening and vaccination as part of the mandatory medical check-ups of government employees.

METHODS

This is a cross-sectional study design, approved by the Institution's Technical Review Board and Research Ethics Committee, using a validated, self-administered questionnaire. Analytic cross-sectional design was used in establishing association between demographic profile of respondents, their knowledge and attitude with their practices and perceived barriers towards HPV infection, screening and vaccination. The study was conducted from August 2020 to November 2020, in various departments in the Municipality of La Trinidad, Benguet, Philippines

Due to the relatively low number of potential respondents, this study included all females, aged 19 to 45 years old, that are employed in various departments in the Municipality of La Trinidad, Benguet. Participants who were excluded include those who were previously diagnosed with HPV or cervical cancer, employees who are absent or on leave during the data collection and those who explicitly did not consent to be part of the study. This study would need 77 participants to give a statistical significance at a confidence interval of 95%. After distribution of questionnaires, a total of 81 participants were recruited in the study constituting the study sample.

Data was collected using a self-administered questionnaire created by the researchers, patterned from several similar studies. Content validation was done by three specialists (Obstetrics and Gynecology-Infectious Disease Specialist, Family Medicine Specialist, Gynecologic Oncologist). A pilot study was performed among 30 female employees meeting the inclusion and exclusion criteria set for the study in different government agencies in Baguio City. Reliability testing was done using the Cronbach's Alpha coefficient test with a value of 0.88 indicating a good inernal consistency between items.

A letter of request was given to the Municipality of La Trinidad, Benguet prior to the study period for permission to conduct the study in their institution. A list of all the employees meeting the set criteria for participants of this study was acquired from the Human Resource Division of the municipality in order to obtain the number of the population. After application of the exclusion criteria, a total of 81 participants were qualified for the study.

The participants were informed about the objectives and purpose of the study on the first page of the questionnaire. Informed consent was obtained by the researcher, assuring the participants of the confidentiality of their responses. Recruitment was purely voluntarily and no form of any compensation and/or incentive was provided to the participants. The respondent was also free to withdraw from participation in the research at any time. Questionnaires were made available in English, Ilokano and Filipino versions to meet the linguistic preference of respondents.

All responses were coded using numbers and were entered in a single data sheet using Statistical Package for the Social Sciences (SPSS) version 18. Section I of the Questionnaire including demographic characteristics of respondents were coded as nominal data except for age, which was coded as numerical data. Knowledge items from Section II of the questionnaire were coded as nominal data. The number of correct responses were tallied so that corresponding scores would reflect the numerical knowledge score of respondents regarding HPV infection, screening and vaccination. Section III and Section IV were coded as ordinal level data. Finally, Section V of the questionnaire was coded as bivariate nominal response for yes or no items and as nominal checklist data for barriers to non-compliance with HPV screening and vaccination.

Descriptive statistics, including means, was used to summarize the age of respondents, the knowledge score and the weighted average of attitude and practice of respondents. For attitude and practice items, qualitative description used for the mean score of respondents using the following ranges: 1.00-1.75 for strongly disagree/never, 1.76-2.50 for disagree/seldom, 2.51-3.25 for agree/sometimes and 3.26-4.00 for strongly agree/always. On the other hand, frequencies and percentages were used in summarizing other data sets. Note that the weighted mean for attitude and practices used reverse numerical coding for items 3, 4 and 5 for Section III and items 4 and 5 for section IV being negatively stated questions. Data scaling for the knowledge score setting a cut-off score of 13 as a satisfactory score for good knowledge based on a 3rd Quartile or 75% cut-off score given the total score of 17. Data scaling for section III and section IV was also performed for the aggregate scores of respondents based on the range descriptors provided above for individual attitude and practice scoring. Finally, data scaling for age was performed using an age range system using a three-tier system classification including 19-27 years for early reproductive, 28-36 years for middle reproductive and 37-45 years for late reproductive years.

All analytic treatment for association used chi-square test of association using the scaled data values for age, knowledge, attitude and the coded number values used for other variables in the study in association with the history of screening and vaccination and general practice of respondents regarding HPV infection, screening and prevention. Also, for data sets that do not meet the requirement for chi-square test of association, which include no cell having a count of 0 and not more than 25% of cell counts having a frequency count less than 5, data scaling including the removal of a given category was performed prior to the statistical testing. Interpretations were based on a p-value of 0.05.

RESULTS

Between August and November 2020, a total of 81 respondents participated in the study. Table 1 presents the clinicodemographic profiles of the respondents. The mean age of the participants in the study is 30.27 years, which belongs to the middle reproductive age range set in the study. Majority of the respondents are single (59.3%), had a tertiary education background (80.2%) and have a monthly salary ranging between Php. 10,000-50,000.00 (67.9%).

Among the respondents, 53.1% indicated that they have a background regarding HPV and almost at an equal rate, some respondents have not heard of any information regarding HPV. On the other hand, 77.8% of respondents were informed regarding pap-smear but only 29.4% of the respondents were able to undergo the procedure. Only 6% have availed of the HPV vaccination.

Perceived barriers on human papilloma virus screening and vaccination

Majority of the participants (36.8%) have identified fear of the procedure as the main factor for not availing the HPV screening services. In addition, 19.3% of the respondents identified inability to communicate their desire for pap smear as a reason for non-compliance (Table 2). In terms of vaccine non-compliance, lack of information about the HPV vaccine (40.0%) the cost of HPV vaccine (17.3%) were identified as the main reasons for non-compliance (Table 2).

Table 1: Clinicodemographic data of respondents.

Parameters (n=81)			Mean (±SD)/Frequency (%)
Sociodemographic profile	Age	Years	30.27 (±7.37)
	Marital status	Single	48 (59.3)
		Married	28 (34.5)
		Separated/annulled	3 (3.7)
		No response	2 (2.5)
	Educational level	Secondary education	5 (6.2)
		Vocational education	1 (1.2)
		Tertiary education	65 (80.2)
		Post-graduate studies	8 (9.9)
		No Response	2 (2.5)
	Monthly income	Php. <10,000	22 (27.2)
		Php. 10,000-50,000	55 (67.9)
		Php. 50,000-100,000	2 (2.5)
		Php. >100,000	1 (1.2)
		No response	1 (1.2)
Clinical profile	Informed about HPV?	Yes	43 (53.1)
		No	38 (46.9)
	Informed about pap smear?	Yes	63 (77.8)
		No	18 (22.2)
	History of pap smear?	Yes	24 (29.6)
		No	57 (70.4)
	History of vaccination?	Yes	6 (7.4)
		No	75 (92.6)

Table 2: Perceived barriers on HPV screening and vaccination.

Parameters		Frequency (%)
Reasons for not having a pap smear (n=57)	I feel scared	21 (36.8)
	I do not know how to consult	11 (19.3)
	I feel embarrassed	9 (15.8)
	I think cytology exams hurt	9 (15.8)
	It is inconvenient	6 (10.5)
	I do not know other women who have had a cytology exam	4 (7)
	I do not need a cytology exam because my partner does not have HPV	3 (5.3)
	I could not afford to	2 (3.5)
	There is not enough privacy at the clinic	2 (3.5)

Continued.

Parameters		Frequency (%)
	My husband or boyfriends does not want me to	1 (1.8)
Reasons for not having vaccine (n=75)	I do not have enough information about the HPV vaccine	30 (40.0)
	The vaccine is too costly	13 (17.3)
	Side effects are too high	6 (8.0)
	My partner does not allow me to take it	3 (4.0)
	My parents do not allow me to take it	3 (4.0)
	My religion does not permit HPV vaccination	2 (2.7)

Table 3: Knowledge on HPV infection, screening and vaccination (N=81).

Knowledge indicators	Yes	No	Don't Know	Rank of correct items
	N (%)			
1) HPV is sexually transmitted	58 (71.6)*	6 (7.4)	17 (21.0)	3
2) HPV infections are rare	25 (30.9)	29 (35.8)*	27 (33.3)	13
3) HPV can cause cervical cancer	60 (74.0)*	2 (2.5)	19 (23.5)	2
4) HPV can infect both men and women	53 (65.5)*	7 (8.6)	21 (25.9)	4
5) HPV infection can occur without symptoms	45 (55.6)*	12 (14.8)	24 (29.6)	8
6) HPV can cause genital warts	46 (56.8)*	9 (11.1)	26 (32.1)	7
7) HPV can cause other genital cancers (e.g., penis, anus)	49 (60.5)*	5 (6.2)	27 (33.3)	5
8) Using condoms can reduce the risk of getting HPV	47 (58.0)*	9 (11.1)	25 (30.9)	6
9) HPV can be cured with antibiotics	24 (29.6)	19 (23.5)*	38 (46.9)	17
10) Pap smear is a screening test to detect cervical cancer	62 (76.6)*	1 (1.2)	18 (22.2)	1
11) Visual inspection with acetic Acid (VIA) is a screening test to detect cervical cancer	29 (35.8)*	5 (6.2)	47 (58.0)	14
12) HPV vaccine can be given to both men and women	38 (46.9)*	10 (12.3)	33 (40.8)	11.5
13) Girls who have had an HPV vaccine do not need a Pap test when they are older	6 (7.4)	43 (53.1)*	32 (39.5)	10
14) HPV vaccines offer protection against most cervical cancer	44 (54.3)*	5 (6.2)	32 (39.5)	9
15) The HPV vaccine requires three doses	21 (25.9)*	10 (12.3)	50 (61.8)	16
16) The HPV vaccine is only for people who are sexually active	15 (18.5)	38 (46.9)*	28 (34.6)	11.5
17) HPV vaccines are most effective is given to people who never had sex	17 (21.0)	24 (29.6)*	40 (49.4)	15

*Expected Correct Response.

Table 4: Attitude towards HPV infection, screening and vaccination (n=81).

Indicators	Mean	Qualitative interpretation
1) A person with HPV infection should have same rights for care as anyone else	3.70	Strongly agree
2) It is safe for people who have HPV infection to work with children	2.57	Agree
3) People who have HPV infection should be isolated	2.06	Disagree
4) People who have HPV infection don't observe personal hygiene	1.98	Disagree
5) People with HPV should be avoided	1.85	Disagree

Continued.

Indicators	Mean	Qualitative interpretation
6) All sexually active women should have a regular pap smear or Visual inspection with Acetic Acid (VIA)	3.35	Strongly agree
7) Pap smears or VIA should be part of the annual physical examination of government employees	3.33	Strongly agree
8) Introduction of HPV vaccine by the government is highly recommended	3.49	Strongly agree
9) HPV vaccine should be given to boys and girls between 10-12 years old	2.72	Agree
10) HPV Vaccine is safe	3.10	Agree
11) HPV vaccine is costly	3.05	Agree
12) It is necessary to see a physician in order to get the HPV vaccine	3.17	Agree
Weighted mean	3.13*	Agree

*Items 3, 4 and 5 coded in reverse to adjust for negative statement.

Table 5: Practices of respondents in line with HPV Infection.

Practices	Mean	Qualitative interpretation
1) If you were at risk of HPV infection how often would you seek guidance and counseling?	3.77	Always
2) If you were to engage in sex, how often will you use a condom?	2.99	Sometimes
3) Do you attend sex education/ lectures/ seminars whenever advertised?	2.25	Seldom
4) If you were an alcoholic beverage drinker, how often will it influence you to sleep with multiple sexual partners?	1.22	Never
5) How often have you had sexual intercourse under the influence of alcohol?	1.31	Never
Weighted mean	3.29*	Always

*Items 4 and 5 coded in reverse to adjust for negative statement.

Table 6: Association of factors to pap-smear, vaccination and infection practices.

Parameters		Pap-smear history		x^2-val	Vaccine history		x^2-val	Infection practices*		x^2-val
		Yes	No		Yes	No		A	S	
Age (n=59)	Early Rep. (19-27 yrs.)	19 (32.20)	6 (10.17)	0.02	1 (1.69)	24 (40.69)	---	4 (6.78)	21 (35.59)	12.54^+
	Middle Rep. (28-36 yrs.)	17 (28.81)	5 (8.48)		1 (1.69)	21 (35.59)		13 (22.03)	9 (15.25)	
	Late Rep. (37-45)	9 (15.25)	3 (5.09)		1 (1.69)	11 (18.65)		8 (13.56)	4 (6.79)	
Marital status (n=76)	Single	34 (44.74)	14 (18.42)	2.17	4 (5.26)	44 (44.98)	0.03	32 (42.10)	16 (21.06)	4.11^+
	Married	24 (31.58)	4 (5.26)		2 (2.63)	26 (34.21)		12 (15.79)	16 (21.05)	
Salary (n=77)	Php. <10,000	16 (20.78)	6 (7.79)	0.79	1 (1.30)	21 (27.28)	0.77	16 (20.78)	6 (7.79)	3.56
	Php. 10,000-50,000	45 (58.44)	10 (12.99)		6 (7.79)	49 (63.63)		27 (35.06)	28 (36.37)	
Knowledge score (n=81)	Satisfactory (Score: ≥13 pts)	19 (23.46)	2 (2.47)	2.64	2 (2.47)	19 (23.46)	0.19	15 (18.51)	6 (7.41)	2.89
	Unsatisfactory (Score <13 pts.)	44 (54.32)	16 (19.75)		4 (4.94)	56 (69.13)		30 (37.04)	30 (37.04)	
Attitude of respondents (n=80)	Strongly agree (4.00-3.26)	45 (56.25)	15 (18.75)	0.86	5 (6.25)	55 (68.75)	0.24	35 (43.75)	25 (31.25)	0.52
	Agree (3.25-2.51)	17 (21.25)	3 (3.75)		1 (1.25)	19 (23.75)		10 (12.5)	10 (12.5)	

Note: Educational Attainment cannot be scaled meet the requirement for chi-square test-statistic, hence, omitted.
* A=Always; S=Sometimes;--- unable to meet statistical requirement, +p-val<0.05.

Knowledge of respondents

The mean score of respondents in the 17-item quiz provided to them regarding HPV yielded to a score of 8.74 (±4.57) points which is relatively low given the 3rd quartile mark for satisfactory rating. In further analysis, only 21 (25.6%) of respondents have a satisfactory knowledge regarding HPV gaining a score of 13 or higher in the administered questionnaire (Table 3). As seen from table 3, item analysis leads to items 1, 3 and 10 as the items with the highest correct answers, with more than 70% of the respondents getting the items right. On the other hand, items 9, 15 and 17 are items with the least number of respondents (30%) getting the answer right.

Attitude of respondents

Respondents have a generally positive outlook, as indicated by a mean of 3.13, regarding patients with HPV (Items 1-5), use of VIA or pap smear for HPV screening (Items 6-7) and HPV vaccination (Items 8-12). In terms of respondents' attitudes, four items yielded to a strongly agree response including items 1, 6, 7 and 8. Items 3, 4 and 5 all pertain to negative attitudes regarding HPV patients which includes perception regarding isolating patients, patient's practice of personal hygiene and avoiding patients with HPV.

These items yielded to a disagree response and have been viewed negatively by respondents (Table 4). Table 4 also shows that participants have a positive attitude towards the use of screening methods or pap smear with/without VIA as indicated by items 6 and 7. Consequently, participants also harbored a general agreement with the use of vaccination as seen from items 8-12 which all yielded to an agree to strongly agree response among respondents. Also, in Item 8, the act of government promoting the use of vaccine generally improves the attitude of respondents regarding the HPV vaccine.

Practices of respondents

Participants are least likely to engage in certain practices that may increase the chance for HPV infection as indicated by a mean practice score of 3.29. Participants also identified that being at risk for HPV would actually increase their chance for guidance and counselling, with a mean score of 3.77. However, it can be seen that participants generally indicate a disinterest in attendance to advertised sex education, lectures and seminars as indicated by a mean score of 2.25 (Table 5).

Associated factors to human papilloma virus infection, screening and vaccination practice of patients

Table 6 presents the associated factors to infection, pap-smear and vaccination practices of respondents. All data computation were scaled to meet the requirement for chi-square test of association, however, educational attainment failed to provide a data set that can be subject to statistical treatment, hence, not included in the association testing. Age group and marital status yielded a significant association with infection practices. Pap smear and vaccination practices were not associated with demographic variables, knowledge and attitudes of respondents.

DISCUSSION

HPV infection is the most common sexually transmitted disease worldwide and the most common viral infection of the reproductive tract, with more than 100 types of HPV, classified as either low risk or high risks/oncogenic types.[8] According to the Philippine Cancer Society Manila Cancer Registry, high risk HPV types such as 16 and 18 are consistently identified as a predisposing factor to cervical cancer in women and penile and anal cancer in men.[9] The Philippines, being both an Asian and a developing country, is socioeconomically predisposed to incur high rates of mortality brought about by cervical cancer. This is compounded by the fact that the Philippines has a population of 34.30 million women aged 15 years and older who are at risk of developing cervical cancer.[3] Although cervical cancer has been proven to be totally preventable through periodic screening, treatment of pre-cancerous lesions and administration of available vaccine, recent reports show that cases of cervical cancer incidence is constantly increasing among women belonging to 15 up to 44 years age range.[3] In Baguio General Hospital and Medical Center, an increasing trend of cervical cancer cases was evident from 2015, 2016 and 2017 with 109, 128 and 202 cases respectively.[4] The current study was targeted towards the general population with the ultimate aim to increase intent to screen and vaccinate. Despite the vast amount of information and statistics regarding HPV, knowledge on the disease remains to be poor. This study showed that a considerable number of respondents have poor knowledge regarding HPV with only 53% indicating that they have a background regarding HPV. This finding is consistent with a study done in Metro Manila on Obstetrics and Gynecology residents which revealed that the knowledge about HPV was generally poor to fair.[2] However, respondents are generally knowledgeable about the mode of transmission and the cancer potential of HPV. This contradicts the study conducted by Koshiol et al, in 2009 showing that only 36.1% of respondents is knowledgeable about the ability of HPV to cause cancer and only 47.4% of respondents is knowledgeable about the sexual transmission of HPV.[10] The result, on the other hand, supports a more recent literature claiming that a general improvement on women's knowledge regarding the nature of HPV have generally improved throughout the years primarily due to improved campaigns regarding the said disease entity.[11]

On the other hand, 77.8% of respondents were informed regarding HPV screening through pap smear and VIA. This study proved that there is a general improvement in the knowledge of respondents on the role of pap smear in screening for HPV and cervical cancer. This contradicts a

recent study showing that only 21.3% of women are aware regarding the role of pap smear in screening for HPV infection and cervical cancer.[11]

While only 29.4% were able to avail of HPV screening procedures, this study found a higher number of pap smear rate as compared to the national prevalence of 7.7–9.3% and is more consistent with existing studies abroad claiming that 20-25% of individuals voluntary request for pap-smear services.[3,13] This indicates an improved number of women availing for HPV screening procedures. This better score among respondents may be attributed to the improved educational attainment among respondents as it was noted that majority of respondents are college graduates.[14]

The low rate of voluntary request for pap smear procedures can be explained by various factors and most important of which are factors relating to fear of procedure and the process entailed in consulting. This finding is consistent with the qualitative report by Adolfsson et al, Paulson et al who identified the factors of communication, treatment and subterfuge (reasons or excuses for not participating) as factors for women's compliance to pap smear screening. In this study, communication, which includes the ability of the patient to ask their physician, has been seen as a major factor and is related to the factor of treatment, which includes the arousal of emotions by patients such as anxiety.[15] The study's findings are also consistent with a study done by the University of the Philippines–Department of Health Cervical Cancer Screening Group who identified that the causes of failure of cervical cancer screening methods include lack of knowledge about symptoms associated with cervical cancer, lack of awareness that cervical cancer is curable, lack of cytologic screening facilities and treatment facilities in rural areas and lack of patient compliance with follow up and treatment.[4] In terms of these, healthcare professionals have a huge role in ensuring that patients feel a sense of trust and confidence in the health care system. It is suggested that physicians should be able to create an atmosphere that promotes openness among patients, give detailed information regarding the procedure and improve access of patients to the said procedures.

One good thing noted in this study is the lesser concern for justifying factors, such as patient priorities and financial consideration among patients, which were identified in a lesser degree amounting to 10.5% and 3.5% respectively of those respondents who did not avail of screening procedures for cervical cancer.

Aside from regular screening, vaccination has been proven to prevent the development of HPV-related cancers. This study shows that only 6% have taken vaccination for HPV which reflects the same extremely low number of women availing for HPV vaccination in other studies. This extremely low rate of access for vaccination services is much more drastic as compared to current literatures concerning other countries where it was reported that at most 29.9% voluntarily request for vaccination services.[16] This indicates that vaccination is still not widely practiced within the context of the study. Lack of information and the cost associated with the HPV vaccine are the major reasons for non-compliance. This finding is again consistent with various studies that have established factors for non-compliance, most commonly the cost and limited knowledge about HPV. Other factors to non-compliance include low perceived risk of HPV infection, no immediate need for vaccination and fear of pain or injections.[17,18]

In terms of the effectivity of the vaccines, this study exclusively found that there is a general misconception that vaccines are only effective to individuals who never had sex. Also, knowledge on the needed dose of HPV vaccine is reflective of the general low degree of completion of HPV vaccines worldwide.[19,20] While no existing reason exist, it can be inferred from this study that the erroneous knowledge of respondents regarding the required number of doses or HPV vaccine may be the reason behind the inability of respondents to comply with the required number of doses. In relation to this, a large part of the burden of vaccine acceptance rests on the shoulders of health care professionals since they play a key role in providing accurate information regarding HPV and vaccination. Another finding of this study is the decreasing concern for women autonomy as only 2.7-4.0% of women who do not comply with HPV vaccination identify religion, parental and spouse control over their decision-making as a barrier to HPV vaccine. This contradicts the common constraint relating to the control of other people over decision-making skills of women which was found to be overwhelmingly significant in various studies.[21,22] Among the people who exert major influence in the decision of women in taking the vaccine, it was identified that school, peers and parents' influence are the strongest influence affecting almost 72.0%, 58.5% and 48.8% of patients respectively. This is much lower than the ability of doctors to influence patients accounting only to 24.4% of patients who take the advice of doctors to get vaccinated against HPV.[23,24] However, given the lower rate of patients identifying such as barriers, this means that the population of women in this study have better autonomy regarding their decision to avail HPV vaccination.

As such, it can be seen from this study that there are still generally low rates of women who avail for pap smear services mostly due to fear of the procedure and inability to communicate desire to avail of such services. The rates for women getting HPV vaccination is also much lower and major factors related to this includes the cost of the vaccine and lack of information regarding the vaccine. In both instances, the ability of the doctor to communicate to patients is extremely important to overcome these barriers. Enhancement of information dissemination programs and improvement of access to screening procedures and vaccination are also important elements in increasing the uptake of screening and vaccination services. Finally, respondents scored least in terms of their ability to

recognize the lack of role of antibiotics in treating a viral infection such as HPV. This is not only true in terms of HPV but for almost all viral infections. A common practice noted in the Philippines is the inappropriate use of antibiotics in any type of infection. As noted in various studies, it is common for Filipinos to use antibiotics for all types of infections, hence, the increasing need for better monitoring of dispense and sale of antibiotics.[25,26]

Respondents have a generally positive outlook regarding HPV, screening and vaccination. Perceptions regarding isolating patients, patient's practice of personal hygiene and avoiding patients with HPV are viewed negatively by respondents indicating that a more positive attitude towards patients with HPV is now an accepted view by the respondents. This could be related to respondents' view that patients with HPV infection should be afforded the same amount of care. It can also be seen that the respondents have a positive attitude towards the use of screening methods such as pap smear and VIA and its inclusion in annual physical examination of government employees. This can possibly explain the reason for a relatively higher number of respondents who underwent screening procedures. Consequently, respondents also harbored a general agreement with the use of vaccination. Also, the act of government promoting the use of HPV vaccine generally improves the attitude of respondents regarding HPV vaccine. This improved attitude of women towards HPV vaccination when promoted by the government is consistent with the finding of a previous study revealing that government recommendation has the highest impact towards women's choice to avail for HPV vaccine among other factors such as family, peer and church recommendations.[24] In relation to this, it is suggested that screening and vaccination programs be incorporated in government health programs and policies to increase coverage for these. The study showed good practices in terms of consult for individuals at risk for HPV. Being at risk for HPV increased the chances for guidance and counselling. However, the respondents generally indicated a disinterest in attendance to advertised sex education, lectures and seminars. This result may be explained by the fact that attendance to advertised sex education, lectures and seminar associated to disease, such as mental health, may relate to the stigma associated by people to such events.[27]

In terms of sexual practices, it can be seen that respondents are generally now accepting to the practice of use of condoms which contradicts the general disagreement towards use of condom in the previous decades.[28] Also, respondents expressed that they are least likely to practice sex under the influence of alcohol, which may explain why men have higher risk for HPV infection as men are more likely to engage in sex under the influence of alcohol as compared to women.[29,30]

In sum, the general findings of this study support practices that prevent HPV among the respondents. Although, the role of sex education, lectures and seminar is still an undervalued practice by the respondents and requires a general improvement in practice. Among the tested factors, only age group and marital status yielded a significant association with infection practices. As noted, much older population group and single individuals are more likely to practice preventive measures towards HPV infection which may be explained by the role of being more at risk towards the potential effects of HPV.[31]

In terms of pap-smear and vaccination practice, no significant association with demographic variables and knowledge and attitude of respondents were noted. The findings were consistent with other studies showing lack of association between knowledge, attitudes and practices, although one major factor in this study is the limitation in terms of respondents.[31-33]

Amidst the lack of association, it was noted that the role of improving knowledge and attitude towards HPV is still crucial towards ensuring a good practice among respondents.[31] To note, the lack of association may be indicative of recall bias among respondents as it can be noted in table 1, a considerable number of respondents identified "Don't Know" as a response to knowledge questions asked.

This study is the first research endeavour to determine the knowledge, attitude and practices (KAP) on HPV infection, screening and vaccination involving Women in the Cordillera region. A strong point of this study is its ability to create an original, valid and reliable questionnaire to assess the KAP of respondents which may be used by future researchers attempting to expand on this topic. Likewise, this questionnaire can be adopted by our health and epidemiological organizations to assess the status of the KAP among the population to address the gaps.

At present, there has been an increasing trend in the number of HPV and cervical cancer cases and a low uptake of screening and vaccination services, hence, this research endorses the need to strengthen primary prevention efforts by aiming at educating the general population, including males and adolescents about HPV, cervical cancer prevention, screening and vaccination. The researchers recommend that health care providers, in coordination with appropriate government offices, spearhead the information dissemination programs.

One major limitation of this study concerns the number of respondents which may not be representative of the entire municipality or region. As it was noted, multiple data scaling were performed to meet the required number of respondents to perform statistical treatment, as such, it is suggested that further studies expanding the number of respondents be performed to accurately answer the objectives in this paper. It is also suggested that the knowledge, attitudes and practices of men be explored in future studies since HPV has implications towards their reproductive health as well. Also, a more detailed

consideration into other factors may be required to fully understand the reluctance of respondents towards pap-smear and HPV vaccination.

CONCLUSION

This study reports that the knowledge of respondents revealed a generally poor score, thus, requiring the need for more information dissemination especially concerning treatment of HPV and nature of vaccination. The score of respondents were relatively higher for the nature of HPV infection and pap-smear screening. In terms of attitudes, respondents show a positive attitude to both people with HPV, the use of screening procedure and the use of vaccination.

Majority of respondents have not yet undergone a pap-smear screening test and HPV vaccination, although the rate of pap-smear locally is greater as compared to both local and international estimates. Likewise, the rate of HPV vaccinations remains to be consistent low. Major reasons identified for such low prevalence of screening and vaccination practice center on the feeling of anxiety and inability to communicate the desire to be screened, the cost of vaccine and lack of information regarding the vaccine, respectively. In terms of practices towards prevention of infection, it can also be noted that respondents have good practice that promotes the general prevention of HPV infection. However, association testing revealed that no significant association between demographic variables, knowledge and attitude of respondents to HPV infection, screening and vaccination practice of respondents. Although marital status and age were noted to be significantly associated with respondents' practice against HPV infection.

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