

# Does the Decision to Avail HPV Vaccine Depend on the Level of Knowledge of Women Ages 25-35 Residing in Metro Manila on HPV and Cervical Cancer

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**Abstract:** - Cervical cancer ranks as the 2<sup>nd</sup> leading cause of cancer among Filipino women wherein 70% of cervical cancer cases worldwide is caused by the human papillomavirus also known as HPV. Because of this, the HPV vaccine was made to protect people from getting infected with the said virus. However, despite the vaccine's availability, women still die from and are being diagnosed with cervical cancer every year. This may be due to other factors that could influence one's decision to get vaccinated or not. The study aimed to determine the relationship between the level of knowledge of women ages 25-35 in Metro Manila on HPV and cervical cancer and their decision to get immunized with HPV vaccine. The study utilized a correlational approach in collecting and analysing the data. A total of 65 respondents were included in the study wherein all of these respondents fit the inclusion criteria of being healthy, Filipino women who are 25-35 years old, and permanently residing in Metro Manila. An online survey through Google forms was deployed online through different social media platforms such as Facebook, Instagram, Discord, and Twitter. The survey focused on testing the respondents' knowledge on HPV, Cervical Cancer, and the HPV vaccine as well as asking about their disposition on HPV vaccination. The data from the study were subjected to Spearman's rho correlation coefficient. The respondents are predominantly "knowledgeable" of HPV, Cervical cancer, and HPV immunization based on their recorded composite score (>50%) wherein more than half of the population were found to have high knowledge on HPV (98.5%), Cervical cancer (93.8%), and HPV vaccine (84.6%). Majority of the respondents (96.9%) also expressed their willingness to be inoculated with the HPV vaccine if it is available, contrary to those who are reluctant with acquiring the said vaccine (3.1%). There is no significant relationship ( $p>0.05$ ) was found between the level of knowledge of women on HPV, cervical cancer, HPV immunization and their disposition on HPV vaccine acceptance. Results of this study showed that there was no correlation between the knowledge of the respondents on HPV, Cervical Cancer, and HPV Vaccine and their willingness to get inoculated with the HPV Vaccine. The findings of this study show that most of the respondents are knowledgeable about HPV, cervical cancer and the HPV vaccine. The majority of the participants are also willing to take the HPV vaccine if it is available to them. Several limitations that may have contributed to the results and findings of this study include the use of convenience sampling and the limited number of respondents. This study is expected to provide information regarding HPV and Cervical cancer which may be beneficial in strengthening, promoting and implementing programs that are related to cervical cancer prevention and awareness.

**Key Words:** — *Human papillomavirus, Cervical cancer, Knowledge, Vaccine.*

## I. INTRODUCTION

Cervical cancer ranks as the 2<sup>nd</sup> leading cause of cancer among Filipino women (Bruni et al., 2019). There are several risk factors attributed to the development of cervical cancer, however. According to the HPV Information Centre, 70% of cervical cancer cases worldwide are caused by the human papillomavirus also known as HPV, specifically types 16 and

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18, which can be transmitted through sexual contact with an individual who is infected with the virus. Because of this, the HPV vaccine was created to protect people against HPV types 16 and 18, HPV types 6 and 11 which cause 90% of genital warts cases, and HPV types 31, 33, 45, 52, and 58 which can lead to cervical cancer, anal cancer, vaginal cancer, penile cancer, and throat cancer (National Cancer Institute). Specifically, HPV vaccines stimulate the body to produce antibodies that prevent the virus from infecting other cells as it binds to it whenever the body comes in contact with HPV. As recommended by the World Health Organization (WHO), young adolescent girls, specifically ages 9-14 years old are encouraged to be vaccinated before becoming sexually active as this vaccine would be most effective to those who have not been previously exposed to the virus. The vaccine is recommended to be given in a series of shots wherein it is given in 3 separate shots for individuals who are of 15-45 years of age. The second shot is given 2 months after the first shot while the third shot is given 4 months after the second shot. For people ages 9-14, on the other hand, are expected to receive 2 shots. The second shot is given 6 months after the first shot (Centers for Disease Control and Prevention). 15 With this in mind, the Centers for Disease Control and Prevention (CDC) stated that getting vaccinated for the Human Papillomavirus is a very safe and highly effective method for the prevention of the disease as more than 120 million doses of the vaccine have already been administered in the United States since it was established in the year 2006. In fact, Bruni et.al had estimated that in 2019, about 15% of girls and 4% of boys had been vaccinated with the full course of vaccine globally. On the other hand, they had also estimated that about 20% and 5% of girls and boys respectively had received at least one dose respectively. In the case of the Philippines, on the other hand, in 2016, the Department of Health (DOH) included the HPV vaccine as part of their National Immunization Program and has launched a school-based HPV vaccination program which enables the HPV vaccine to be readily available to female students. Despite the vaccine being made available in the Philippines, women still die from and are being diagnosed with cervical cancer every year as the numbers are estimated to be at 4088 and 7190 respectively as predicted by ICO/IARC in 2019. This may be due to a lot of factors. In fact, a very significant factor in implementing a vaccination program related to HPV and cervical cancer is the acceptance of the vaccine from the target population (Dwi Endarti et.al., 2017). In addition to that, the World Health Organization (WHO) in 2014 stated the importance of increasing the knowledge and awareness of

cervical cancer prevention in order to achieve a successful program implementation. That being said, it is best to know that knowledge is a collection of various things such as appropriate information, experience, and skilled insight. These things, in turn, offer a person a structure for them to be able to estimate and integrate new experiences as well as new information (Mohajan, 2016). In relation to this, Cvjetkovic, et.al (2017) presumed that with better knowledge about immunization comes a 16 positive attitude based on the theory that one of the crucial sources of attitude is said to be cognitive information regarding the target topic. With that, this study aimed to determine the level of knowledge of the women ages 25-35 permanently residing in Metro Manila and observe if this would have any effect on their decision to be immunized with the HPV vaccine. Furthermore, with this study, the information drive for doctors regarding both HPV and cervical cancer can be bolstered so that further awareness and prevention of these diseases and the risk factors that lead up to it can be promoted and prioritized more.

## II. THEORETICAL STUDIES

This study was based on the theory that knowledge and beliefs regarding vaccines is a contributing factor, which influences the attitude towards vaccination and the intention of an individual to be immunized (Handy L.K., et al. 2017). According to Cvjetkovic S.J., et al (2017), better knowledge on immunization would project increased positive attitudes on vaccine acceptance. Thus, this presumption necessitates sufficient and appropriate education regarding a specific topic in order to direct a positive attitude towards the aforementioned. Various correlational studies that indicate positive and negative perceptions towards HPV vaccine further strengthen this theory. Multiple studies have shown that knowledge is significantly associated with vaccine acceptance. Several studies state that higher knowledge about Human Papillomavirus and HPV vaccination is significantly associated with increased willingness to be vaccinated (Chang, I., et al., 2013 & Oz, M., et.al., 2018). On the other hand, low vaccine acceptance can be attributed to factors such as lack of knowledge about the disease as well as lack of knowledge on the safety profile and efficacy of HPV vaccine (Lopez, N., et al., 2020). With these related studies as a framework, the researchers want to determine if there is a significant relationship that exists between the level of knowledge of the subjects on Human Papillomavirus and cervical cancer and their willingness to be vaccinated against HPV. As future

medical professionals, this correlational research would be a beneficial foundation as a basis for further related studies in HPV vaccine hesitancy.

### III. METHODOLOGY

#### A. Research Design

This study utilized a correlational approach in collecting and analyzing data. The researchers have defined the extent of knowledge of women ages 25-35 on the Human Papillomavirus (HPV) vaccine and Cervical cancer as the exposure variable and the disposition of women ages 25-35 on their willingness to be immunized with the Human Papillomavirus (HPV) vaccine as the outcome variable. In relation to the study, the knowledge of 25-35-year-old females residing in Metro Manila regarding the Human Papillomavirus and cervical cancer and their willingness to acquire the HPV vaccine was used as the primary data. The correlational approach allowed the researchers to determine the possible relationship between the exposure and outcome variables. An online survey through Google forms was used to gather the data needed to address the research problem and objectives. The questionnaire was adapted by the researchers from existing online surveys from different journals to gather data needed for the study. The respondents of the survey consisted of women who are within the specific parameters, which include the age range of 25 to 35 years old. The survey was deployed online and was disseminated among women who are residing in Metro Manila. In addition, the survey was deployed through different social media platforms such as Facebook, Instagram, Discord, and Twitter. Quantitative data was collected from all the respondents and were interpreted statistically to get results.

#### B. Subject and study site

The sampling technique conducted in this study is convenience sampling, which was used in the selection of the respondents. The population was selected primarily based on their availability as well as their ability to access the online survey. Furthermore, the researchers chose the sample according to the eligibility of the participant based on the inclusion and exclusion criteria. Inclusion Criteria: - Healthy, Filipino women - Within the age range of 25-35 years old - Permanent residents of Metro Manila Exclusion Criteria: - Women residing outside Metro Manila - Cancer patients - Medical professionals - Women who are already vaccinated with the HPV vaccine the criteria for withdrawal, on the other hand, included those who do not wish to further participate in

the study. The respondents participated in the study through an online survey deployed using different social media platforms such as Facebook, Instagram, and Twitter. In addition, the surveys contained various questions that aided the researchers in data gathering. Even though the data gathering would be conducted online, the study site of the research was located in Metro Manila, where the chosen respondents are permanently residing. Metro Manila was chosen as the study site for this research because the PCS-MRC in Metro Manila is considered as the lead organization that is partnered with DOH in terms of the Cancer incidence, survival as well as the implementation of cancer control programs in the Philippines hence, the data on cervical cancer as well as HPV immunization has been made accessible for the researchers. In determining the minimum number of respondents required, a related study done by Ning et al., (2019) was used as a reference to determine the sample size.

The formula that was used may be seen below:

$$n_r = 4pq / d^2$$

$n_r$  = required sample size

4 = rounded Z 2 value of 1.96 at 95% confidence level

$p$  = proportion of the population having the characteristic; in Ning et al. 2020, 20% knew about HPV Vaccine = 0.20

$$q = 1 - p = 1 - 0.20 = 0.80$$

$d$  = the degree of precision (margin of error); set at 10%

$$n_r = 4 * 0.20 * 0.80 / (0.1)^2 = 0.64 / 0.01 = 64$$

#### C. Data measure/instrumentation

The researchers applied the method of convenience sampling in gathering the respondents for the reason that the selection of the target population was more convenient for the group considering the constraints brought upon by the pandemic. For the instrumentation, the researchers utilized a survey questionnaire as a tool to determine the knowledge of women on HPV and Cervical cancer and its correlation to their willingness to procure the HPV vaccine. The survey was further divided into four sections, which were written in both English and Filipino language. The sections of the questionnaire were focused on the personal consent of the respondent, the socio-demographic portion, knowledge part regarding HPV, Cervical Cancer, and the HPV Vaccine, and the Disposition on HPV immunization. The survey deployed was a guided-response-type of questionnaire that allowed the participants to respond on polar type of questions that were answerable by true or false,

in which the “correct” answer corresponded to 1 while the “incorrect” answer is coded as 0. This format was observed throughout the knowledge part of the survey while the consent and Disposition on HPV Immunization was answerable by yes or no. The sociodemographic part, on the other hand, was answered through a multi select type of choices. The knowledge of the participants is evaluated by utilizing a composite score. If the participants have scored a composite score of greater than or equal to 50%, the participants were considered to be knowledgeable (Gatumo et al., 2018). The questionnaire consisted of questions that were adapted from the studies of Gatumo, et al. (2018), Mbachu C., Dim C., and Ezeoke U. (2017), Sherman S. M., et al. (2018), and Xue L., et al. (2017). However, other questions from those studies were not included in the survey for the reason that these questions were not related anymore to the study at hand.

The adapted questionnaire from the aforementioned multiple studies were validated through face validity wherein the survey questions were peer reviewed by experts. This measure was done to ensure that the questions included in the survey are well structured, appropriate and within the scope of the study. These experts included members of specialist doctors from Antique Medical Center and Anghel Salazar Memorial General Hospital. For ethical concerns, the questions that were conveyed in the survey were consulted with the research ethics committee.

*Consent Section.* The survey allotted a consent section for the purpose of obtaining informed consent among its respondents. This section involved questions regarding the voluntary participation of the respondent in the study. In addition, the respondents were asked for permission to use the data generated from this survey according to the researcher’s purpose and nature of the study.

*Socio-demographic section.* The questionnaire from this segment was adapted from the study of Gatumo, M., Gacheri, S., Sayed, AR. et al. (2018), Mbachu C., Dim C., and Ezeoke U. (2017), Sherman S. M., et al. (2018), and Xue L., et al. (2017). This part included survey questions about basic socio-demographic information such as name of the respondent (optional), age, civil status, and parity. Objective questions on multiple pregnancy were inquired in this section to further determine the associated risk factors of HPV vaccination and Cervical cancer. The queries included in this survey section were in multiple choice.

*Knowledge Section.* This part consisted of questions adapted from the study of Sherman S. M., et al. (2018) and

Gatumo, M., Gacheri, S., Sayed, AR. et al. (2018), which pertained to the level of knowledge and awareness of the respondents on HPV, Cervical cancer, and HPV vaccination. The questions ranged from general to some in-depth information about the aforementioned in order to assess the participants’ extent of knowledge about the topic of the study. This section contained questions answerable by true or false.

*Disposition on HPV Immunization.* This section included the final question that assessed the disposition or willingness of the respondents to be immunized with HPV vaccine. The question was adapted from the study of Xue L., et al. (2017). With that, the researchers administered the survey on selected women who met the specific criteria as eligible respondents of the study. The survey was deployed online by utilizing Google forms at its main platform of dissemination and was shared through different social media platforms such as Facebook, Instagram, and Twitter as well as Discord.

#### *D. Data gathering procedure*

The researchers have asked for the approval of the ethics review board in line with the ethical considerations of the study. Upon approval, the researchers started to disseminate the survey forms. Considering the current situation, with the on-going pandemic, data gathering process was done through a Google Form link that has been sent out. Selection of participants was done through convenience sampling. Forms were shared through different social media platforms by posting on different Facebook research groups as well on Discord servers, Twitter posts, and Instagram stories. The questionnaires were answered by willing participants that belong to the inclusion criteria.

The whole data gathering process was conducted in a span of a month. In the Google Form, the researchers have emphasized the purpose and the significance of the study including the possible risks in answering the survey. An informed consent for the participants' permission to continue on with the survey was also included in the form. The forms were strictly answered by the willing participants that had met the inclusion criteria for this study. Researchers have officially closed the form and ended the data gathering process when the total number of responses counted has already met the designated sample size for the study.

#### *E. Ethical considerations*

The researchers devised a survey form in which the purpose of such was explained in full detail in order to inform the subjects of the implications of answering the survey. In

addition, the survey was accompanied with a consent form for subjects to fill out before continuing on to the actual survey questions. People who were deemed fit to be subjects in the study were not barred from participating in the survey unless the existing exclusion criteria matched them. The identities of the subjects were kept confidential. The identities were only shared between the researchers and the subjects involved through coding measures. The survey did not require the subjects to undergo any tasks and was purely answered voluntarily by the subjects without any stipends nor monetary exchange. The researchers did not practice any biases in conducting the study wherein all results that were generated from the study was only based on the data that was gathered from the surveys conducted online.

#### *F. Data analysis*

Data gathered were encoded in Microsoft Excel and were analyzed using a software called IBM Statistical Package for Social Science (SPSS) through descriptive and correlational statistical methods in which the alpha level was set at 0.05. Descriptive statistics was utilized to analyze all the data collected showing the number of responses, percentages, the mean and standard deviation of the participant's age and the scores that they have attained for each section.

In addition to that, Spearman's rho correlation coefficient was utilized to investigate the relationship between the level of knowledge of women ages 25-35 residing in Metro Manila on HPV and cervical cancer and their willingness to be vaccinated with the HPV vaccine. Spearman's rho correlation coefficient, a nonparametric test, was found to be more appropriate in analyzing the data for this study as compared to Pearson's correlation coefficient because of the consideration that the data collected was categorical, specifically the 'true' or 'false' and the 'yes' or 'no' choices while Pearson's correlation coefficient uses continuous data.

## IV. RESULTS AND DISCUSSION

### *A. Results*

#### *Socio-demographic:*

Overall, a total of 86 responses were gathered but 21 participants were excluded for not being able to meet some of the inclusion criteria. Specifically, the excluded participants were not residing in Metro Manila or did not meet the age range of 25-35 years. Another reason for the exclusion is because other participants have already been vaccinated or are working

in the field of medicine. With the consideration of the inclusion and exclusion criteria, a total of 65 respondents are used in the study to assess their level of knowledge with regards to Human Papilloma Virus (HPV).

Table.1. Sociodemographic profile of the respondents (n=65)

Characteristics	n	(%)
Age in years, mean (SD)	28.4	3.2
<b>Marital Status</b>		
Single	56	86.2
Married	9	13.8
<b>Parity (Number of Pregnancies)</b>		
0	51	78.5
1	8	12.3
2	4	6.2
3	2	3.1
<b>Number of children</b>		
0	51	78.5
1	9	13.9
2	4	6.2
3	1	1.5



<b>Occupation</b>		
Employed/Self-employed	58	89.3
Housewife	1	1.5
Student	4	6.2
Unemployed	2	3.1
<b>City Residence</b>		
Caloocan	1	1.5
Las Pinas	3	4.6
Makati	6	9.2
Mandaluyong	2	3.1
Manila	15	23.1
Marikina	2	3.1
Muntinlupa	6	9.2
Paranaque	4	6.2
Pasig	3	4.6
Quezon	17	26.2
San Juan	2	3.1
Taguig	4	6.2

Table.1. shows that the mean average Age computed for a total of 65 respondents is 28.4 years. Out of the 65 participants who have completed the survey, the marital status of the majority of the participants are single (86.2%). On parity, the highest percentage of the respondents show that 78.5% had 0 number of pregnancies. In addition, the results on the number of children indicate that 78.5% of the participants have no children. Furthermore, on occupation, a total of 89.3% of the respondents are either employed or self-employed. The statistics on the characteristics of the participants based on their permanent residence show that most of the respondents reside in Quezon City (26.2%).

*Knowledge on HPV, Cervical Cancer and HPV Vaccine:*

Table.2. HPV, Cervical cancer and HPV vaccine knowledge questions.

	<b>Correct Response N (%)</b>
<b>HPV Knowledge and Awareness</b>	
HPV can cause cervical cancer	54 (83.1)
Having many sexual partners increase the risk of getting HPV	62 (95.4)
HPV can be passed on during sexual intercourse	55 (84.6)
A person could have HPV for many years without knowing it	61 (93.8)
HPV always has a visible signs and symptoms	45 (69.2)
HPV is very rare	52 (80.0)
There are many types of HPV	59 (90.7)
Men cannot get HPV	53 (81.5)
Using condoms reduces the risk of getting HPV	52 (80.0)
HPV can be passed on by genital skin-to-skin contact	45 (69.2)
HPV can be cured with antibiotics	44 (67.7)
HPV can cause HIV/AIDS	25 (38.5)
HPV can cause genital warts	59 (90.7)

Most sexually active people will get HPV at some point in their lives	45 (67.7)
Having sex at an early age increases the risk getting HPV	47 (72.3)
HPV usually doesn't need any treatment	17 (26.2)
<b>Cervical Cancer Knowledge and Awareness</b>	
Cervical cancer is preventable	63 (96.9)
Having many different sexual partners is a risk for cervical cancer	50 (76.9)
Oral contraception is a risk factor for cervical cancer	29 (44.6)
Smoking is a risk factor for cervical cancer	48 (73.8)
HIV is a risk factor for cervical cancer	50 (76.9)
Cervical cancer is more likely to be diagnosed when you have a family history of cervical cancer	56 (86.2)
Giving birth to many babies is a risk factor for cervical cancer	24 (36.9)
HPV is a risk for cervical cancer	56 (86.2)
<b>HPV Vaccine Knowledge and Awareness</b>	
The HPV vaccines are most effective if given to people who have never had sexual intercourse	34 (52.3)
The HPV vaccine offers protection against most cervical cancers	60 (92.3)
Someone who previously had HPV vaccine cannot develop cervical cancer	49 (75.4)
The HPV vaccine offers protection against genital warts	52 (80.0)
The HPV vaccine offers protection against all sexually transmitted infections	31 (47.7)
The recommended vaccine doses is three	32 (49.2)
Women who previously had the HPV vaccine do not need to undergo smear test in the future	61 (93.8)

Shown in Table.2, the total number and percentage of respondents who were able to answer correctly in each question listed. The researchers, with the help of a statistician, had computed the mean scores of the participants in each part. Those who had a composite score of greater than or equal to 50% were considered to be knowledgeable. In the 16-point set of questions about HPV knowledge and awareness, the mean score of the participants is  $11.9 (\pm 2.2)$ . From the results of the participants in this part of the survey, it is noted that 64 had gotten at least 8 items correct hence it can be said that 98.5% of the respondents are considered to be knowledgeable about HPV. In the case of the participants' knowledge and awareness of Cervical Cancer, the mean score in the eight-point questionnaire is  $5.8 (\pm 1.5)$ . For the HPV vaccine knowledge and awareness, the mean score in the seven-item survey is  $4.9 (\pm 1.1)$ . From this, it can be said that 93.8% and 84.6% of the respondents are considered knowledgeable in cervical cancer and in HPV vaccine respectively the respondents had garnered a minimum of four points and above in the sections of the questionnaire on cervical cancer and HPV vaccine.

#### *Disposition on HPV Vaccination:*

Figure.2. Willingness to take the HPV vaccine

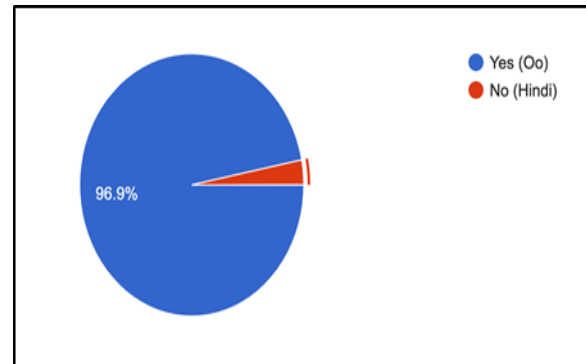


Fig.2. shows that a total of 63 or 96.9% of the respondents are willing to be immunized with the HPV vaccine.

#### *Correlation:*

The data collected from the survey was subjected to statistical analysis using Spearman's Rank Order Correlation since the data gathered is considered as categorical data wherein questions in the survey were answerable by either "True" or "False". The analysis was done in order to assess the correlation between the level of knowledge of the participants on HPV, Cervical Cancer, and HPV vaccine and their disposition on getting vaccinated against HPV.

Table.3. Spearman's Rank Order Correlation between the level of knowledge and awareness of respondents and their disposition on HPV immunization (n=65)

			Willingness to take HPV Vaccine
Knowledge and awareness on	HPV	Correlation Coefficient	.127
		Sig. (2-tailed)	.312
	Cervical Cancer	Correlation Coefficient	.225
		Sig. (2-tailed)	.072
	HPV Vaccine	Correlation Coefficient	.178
		Sig. (2-tailed)	.157

\*\* Correlation is significant at the 0.01 level (2-tailed)

\* Correlation is significant at the 0.05 level (2-tailed)

Table.3. shows the results of the statistical analysis using Spearman's rho correlation. From the results, it can be seen that the p-values calculated from each section of the survey regarding knowledge and awareness on HPV, Cervical Cancer, and HPV Vaccine were not significant. With this, it can be inferred there is no correlation between HPV knowledge and awareness and the willingness of the participants to get vaccinated ( $r_s = .127$ ,  $p = .312$ ). Similarly, there is no correlation existing as well between the knowledge and awareness on cervical cancer and the participants' inclination to get inoculated with the HPV vaccine ( $r_s = .225$ ,  $p = .072$ ). There is also no correlation found between HPV vaccine knowledge and awareness, and the disposition of the respondents to get HPV inoculation ( $r_s = .178$ ,  $p = .157$ ).

### B. Discussion

#### Socio-demographic factors:

In this study, 65 out of 86 respondents were included while 21 respondents were excluded due to not being able to adhere to the inclusion criteria. As the researchers assess the knowledge of the respondents, sociodemographic factors were also reviewed since they contribute to the prevalence of Human papillomavirus and cervical cancer and can also influence the willingness of participants to acquire HPV vaccination.

Age is one of the significant factors of HPV infection and cervical cancer as it can be an indicator of prevalence. This can also be a predisposing factor to HPV vaccine acceptance. Young women more than 18 years of age are more likely to have HPV infection while older women have less prevalence than younger women. This is said in a study by Andersen, B., et al. in 2019 and the study reports that the prevalence of HPV decreases slightly as the age increases. This pattern of decreased prevalence can also be seen in a study by Krashias, G., et al. in 2017, which tested 596 women for HPV prevalence and type distribution. It stated that the HPV prevalence is dependent on age and this prevalence decreases until the age of 45 years. Its results show that the highest prevalence is seen in women ages 25 and below, followed by women ages 26 – 35 as well as women ages 46 and below and lastly, the lowest prevalence is seen in women who are within the ages of 36 – 45 years old. Additionally, in a study by Brotherton, J. M., et al. in 2019, an HPV based cervical screening was conducted among 116, 052 women ages 25 – 74, its results showed that HPV prevalence reaches its peak at the ages of 25 – 29. In the researchers' study, the results show that the mean age of the participants is 28.4, which is within the age range of peak prevalence, which can impact their disposition on HPV immunization.

In the survey conducted by the researchers, the majority (86.2%) of the respondents are married while 13.8% are single. Relationship status is another sociodemographic factor which is to be considered. Although there are no known studies that correlate relationship status and HPV prevalence, it can be associated with HPV vaccination uptake and various studies assess the impact of relationship status on vaccination. A study by Thompson, E., et.al. in 2016 stated that women living with a partner and single women have more interest in HPV vaccine than married women. Furthermore, in another study by Thompson, E., et al in 2019, women in committed relationships see themselves as having low risk for HPV. However, another study conducted a study regarding HPV infection in early pregnancy and the results show that in the population, women with longer married life as well as high



BMI are more frequently confirmed with HPV positive status, which can have an indirect correlation with years of sexual activity (Pandey, D. et al., 2019). Based on the studies, the relationship status of the participants may be a factor to their decision to avail vaccination as majority of the participants have chosen 'Yes' on their disposition on HPV immunization.

Majority of the respondents in this study have no pregnancies while others have one (12.3%), two (6.2%) and three (3.1%) number of pregnancies, respectively. Parity can also be associated since HPV can be presented in early pregnancy due to changed hormonal milieu and immune response. HPV infection can also be attributed to preeclampsia, placental abnormalities, preterm deliveries and other pregnancy adverse outcomes (Pradhan, S. R., et al., 2020). In study by Pandey, D., et al. in 2019, the researchers discussed about HPV infection in early pregnancy, the results have shown that in African pregnant women, the prevalence of HPV DNA was 33.3% and the researchers also mentioned that in Brazil, there is a higher prevalence of HPV in pregnant women as compared to non-pregnant women. As there are participants in the study who have multiple pregnancies, parity may play a role in their willingness to be vaccinated.

Lastly, it has been stated in this study that sociodemographic factors such as employment and residential setting can affect HPV knowledge and awareness of participants. This can be supported by a study conducted by Cimke, V. S., et al. in 2019 as they conducted interviews with 753 women in various professions regarding early diagnosis of cervical cancer. In the study, the researchers stated women who have good education and income level and women who live in the city are considered as knowledgeable in HPV, HPV vaccination, Pap smear test, and cervical cancer. The study reported that doctors have the highest knowledge level while homemakers have the lowest. Although, in another study which consists of homemakers and unqualified workers as participants, it produced higher results than the previous study mentioned (Raychaudhuri & Mandal, 2012). In our study, employment can be considered as a factor in willingness to be vaccinated since the majority of our participants are employed which could mean that they have possible financial capability as well as an educational attainment. However, income level and educational attainment were not included in our study and could be further investigated in future studies regarding their association in the participants' willingness to be vaccinated. The focus of the researchers' study are respondents living in Metro Manila, which is the largest urban area in the Philippines.

Residential setting is also considered as a factor associated with HPV and HPV vaccine knowledge, as shown in a study by Fernández-Feito, A., et.al. in 2020, which conducted a questionnaire among a sample of Spanish women and analyzed their level of knowledge in relation to education level and residential setting. The results stated that women living in rural areas are associated with having little or no knowledge whereas, women who are living in more urban areas are associated with having more knowledge about HPV infection and HPV vaccine. Based on this study, it can be inferred that the participants in the study may be knowledgeable since they live in an urban area.

In this study, the researchers focused more on the level of knowledge of the respondents on HPV, cervical cancer and HPV vaccine and its association to the respondents' willingness to be immunized with HPV vaccine. The sociodemographic factors were only identified as predisposing indicators that may influence the rate of HPV vaccine acceptance among the respondents.

#### *Knowledge on HPV, Cervical Cancer and HPV Vaccine:*

Furthermore, the findings in this study showed that 93.8% of our respondents are knowledgeable in cervical cancer and 84.6% of the respondents are knowledgeable in HPV vaccine. This is based on the criteria that the respondent must have a composite score greater than or equal 50% in order to be considered as knowledgeable. The focus of this study is on the correlation of the level of knowledge on HPV, cervical cancer and HPV vaccine and the willingness of the participants to be immunized with HPV vaccine. Many studies show that knowledge level significantly impacts the disposition on HPV immunization. Different studies report varying results in regards to the association of knowledge and HPV immunization. A study by Oz, M., et al. in 2018 reports the high knowledge levels are related to increased willingness to be vaccinated. On the other hand, a study by Lee, Y. M., et al. in 2018 shows that lack of knowledge about HPV as well as negative perceptions on HPV vaccination becomes a barrier in appropriate information and this lowers vaccination rates. These studies strengthen the association of level of knowledge and the willingness to be vaccinated.

#### *Willingness to take the HPV vaccine:*

In accordance with the conducted survey on the willingness of women aged 25-35 with regards to taking the HPV vaccine, its results show that the majority of the respondents, which comprised of 96.9% of the total

respondents, showed willingness to be immunized with the vaccine if it is available, while 3.1% respondents expressed their hesitancy in acquiring the said vaccine as per the results of the conducted online survey. Vaccine hesitancy is an arising global concern wherein the public refuses vaccine inoculation despite its availability which is commonly influenced by factors such as complacency, overconfidence, and unawareness. Accordingly, this attitude is observed in the topic of HPV vaccination in several studies. A study done by Dwi Endarti et.al. (2018) determined that women in Yogyakarta Province in Indonesia perceive HPV vaccination in a negative manner due to the price of the vaccine and the lack of information regarding the HPV and cervical cancer. Results of the study also showed a low percentage of vaccinated individuals among the population used by the researchers. A study conducted by Decena & Benavides (2017) also expounded the different factors that hinders obstetrics and gynecology residents in prescribing and vaccinating their patients. The most common reasons include safety concerns and lack of information as well.

Despite the growing hesitancy among the public, several studies have shown that communities still exhibit a high acceptance rate of acquiring the HPV vaccine, which is reflected by the results garnered in this study. The finding of a high acceptance rate is similar to the result of the research done by Dwi Endarti et.al. (2018) wherein 92% of female adolescents, 90% of adult women, and 91% of parents included in the population were willing to take the HPV vaccine. Despite the unsatisfactory level of knowledge and awareness of the participants regarding HPV and cervical cancer, an opposite reaction from the participants was observed when asked if they are willing to be vaccinated. Based on the data the authors acquired from the survey, the efficacy of HPV vaccine and screening was the main factor that enhanced the acceptance of the respondents to the said vaccine. The results from the study by He & He (2016) are comparable with the finding of a high acceptance rate since half of the respondents in the Health Management Center of West China Hospital of Sichuan University were willing to take the HPV vaccine upon awareness of its effectiveness against HPV infection. The authors of the study concluded that the willingness of the respondents rely upon their age and family history of cervical cancer where women aged 18-29 and women with known history are more accepting. Another study that demonstrated a high acceptance rate of the vaccine in a certain population was done by Baloch et al. (2017). The study was conducted in Yunnan Province, China and the researchers recruited women who frequent the outpatient department of the First People's

Hospital of Yunnan. 38% of the participants were aged 31-40 who are mostly married and with children. The results featured a low awareness regarding the availability of the vaccine, however, the majority of the participants at 82.7% were willing to vaccinate their children when they are of age. A study conducted by Zhang et al. (2020) also exhibited a high acceptance rate of HPV vaccination among Chinese adolescents studying in urban and rural schools. Out of the 4,062 respondents, 2,733 were willing to be vaccinated with the HPV vaccine wherein 72.6% are female Chinese students.

The respondents of this study are healthy women aged 25-35 who permanently reside in Metro Manila. Health-allied professionals, cancer patients, and women who are already vaccinated with the HPV vaccine are excluded from the study. The researchers did not expound on the factors that can be significantly associated with the willingness of the respondents to have the vaccine. However, potential relationships between the inclusion criteria of the target population and the acceptability of the respondents can be further investigated in future studies. The possible determinants that resulted in a 96.9% acceptance rate of the vaccine which are not stated in the inclusion criteria are most likely the educational attainment, knowledge about the efficacy and safety of vaccines, frequency of sexual activity, and recommendations from different sources such as doctors, family, and peers. Further studies regarding these factors should be done to gain sufficient data to establish a rationale pertaining to the high acceptance rate of the respondents.

Regardless of the high level of willingness of the participants to receive the vaccine, the researchers acknowledge the limitations of the study that may have partaken in the outcome of the results. The 65 respondents from this study cannot represent the totality of women aged 25-35 living in Metro Manila since convenience sampling was utilized. Aside from the method of sampling, online surveys also hinder possible respondents from answering the survey since it is inaccessible to those who lack internet connectivity and are unfamiliar with the use of Google Forms and e-mails. Further studies may be done to address the limitations mentioned above.

#### *Correlation:*

The researchers proposed to correlate the data on the level of knowledge of the respondents to their disposition on HPV immunization which was obtained from the conducted survey. Although the level of knowledge of the participants regarding HPV, Cervical Cancer, and HPV vaccination as well

as the willingness to vaccinate were considerably high, a correlation between these two variables were found to be insignificant. Determining the relationship between knowledge and choice is a frequent topic of study in the fields of psychology and behaviour. A theory by Handy et al. (2017) stated that knowledge and beliefs directly affect the attitude and intention of a person towards the idea of vaccination. The researchers established the main objective of this study in order to investigate whether this idea is applicable with HPV knowledge and vaccine.

Various studies also tested the association between these two variables and came to a conclusion based on the data they acquired. These studies showed no correlation or relationship between the level of knowledge and willingness or attitude of the participants to the vaccine, which is significantly observed in the study. Comparable to the findings of the study is research done by Zouheir et al. (2016) wherein the data presented suggests that knowledge about HPV did not have a significant impact or association with vaccine acceptance. The level of knowledge from the respondents who were mainly adolescents and young adults were found to be unsatisfactory as well as the acceptance of the HPV vaccine despite the high prevalence of this disease in Morocco. The authors suggested that the low levels of these variables are most likely because of the predominant culture present in Morocco. Moroccan culture is deemed to be more sexually conservative as compared to western countries, hence, topics such as HPV and HPV vaccination is considered a taboo topic, affecting the knowledge and awareness of young adults (Zouheir et al., 2016). Association between the knowledge and attitude towards the HPV vaccine is also absent in the systematic review of Prue et al. (2016). This review focused on studies dealing with the knowledge and acceptance of adolescent boys towards HPV and HPV vaccination in the US and Europe. The authors established that knowledge does not predict the willingness of adolescent boys to have the vaccine as seen in high quality studies included in this review such as the study by Moss et al. (2015) which does not support the hypothesis about the possible correlation between the two variables. The results in this review are in line with the findings of the main study and were able to support the claim of Prue et al. regarding the lack of correlation, however, the study focused more on middle aged women rather than adolescent boys. Further studies with Filipino adolescents may be done to ensure the reliability of Prue et al.'s claims.

Contrarily, several studies found that there is a correlation between the extent of knowledge about HPV and the

willingness to be vaccinated. Cvjetkovic et.al. (2017) stated that a higher level of knowledge is most likely predictive of high acceptability towards HPV vaccination. The authors also mentioned similar studies where a significant relationship is found between the two variables. Although, part of the limitations of this study is that Cvjetkovic et al. only garnered respondents that are students of medicine, law, and technical engineering from University of Belgrade in Serbia, therefore, the results cannot represent the total population of students who were members of an official online student groups. The authors recommended further research with a larger sample size to acquire more specific data. Another study showing a significant correlation is conducted by Adesina et.al. (2018) wherein the authors were able to demonstrate a relationship between HPV knowledge and HPV vaccine acceptability. Adesina et.al. concluded that the level of knowledge of mothers in Ilorin, Nigeria is a crucial determinant of their willingness to vaccinate their daughters. The possible reasons that led to this result are differences in prior knowledge and varying populations as stated by the authors. Implications were still made regarding HPV knowledge and vaccination despite the lack of correlation between the two. Adesina et.al. (2018) recommended that public campaigns and programs specific for HPV, Cervical Cancer, and HPV vaccine should be implemented in Ilorin, Nigeria, as well as including the vaccine to the National Immunization Program.

The researchers also acknowledge the limitations that may have affected the outcome of the study. A huge percentage of the participants responded as willing to be vaccinated in contrast to the 3.1% who refused the vaccination despite its availability. A correlation cannot be made since the difference between the two variables were too distant to establish a relationship. One of the potential factors that led to this outcome is the sampling method utilized by the researchers. Since convenience sampling was used, the respondents cannot represent the totality of the population regardless of the objectivity of the inclusion criteria. Further studies may be done to address the limitations mentioned above.

## V. CONCLUSION

The study at hand was conducted for the sole purpose of determining whether or not a relationship exists between the level of knowledge of women ages 25-35 in Metro Manila on HPV and cervical cancer and their decision to get immunized with HPV vaccine. Based on the results from the statistical analysis, it is evident that there was no correlation at all existing

between the knowledge of the respondents on HPV, Cervical Cancer, and HPV Vaccine and their willingness to get inoculated with the HPV Vaccine. The findings of this study suggest that most of the respondents are knowledgeable about HPV, cervical cancer and the HPV vaccine. In addition to this, the majority of the participants are also willing to take the HPV vaccine if it is available to them. Several limitations such as the sampling method utilized and the limited number of respondents may have contributed to the results and findings of the study. The results of this study may provide further insight regarding the current situation of the level of knowledge of women ages 25-35 permanently residing in Metro Manila and their decision to get vaccinated with the HPV vaccine. This study is also expected to give information that may be appropriate and beneficial in strengthening, promoting and implementing programs related to cervical cancer prevention and awareness. Lastly, this may be used as a reference for future studies in the Philippines that will discuss the relationship between the level of knowledge of women on HPV and Cervical cancer and their decision to get vaccinated.

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