



Human Papilloma Virus Vaccination Acceptance of Elementary School Student's Parents

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Article Info

Article History:
Submitted February 2021
Accepted May 2021
Published July 2021

Keywords:
Human Papilloma Virus;
Vaccination; Student

DOI
<https://doi.org/10.15294/kemas.v17i1.29319>

Abstract

A costless vaccination program had been implemented in Badung Regency, but there were parents of elementary schoolgirls who did not give written consents to their daughters for joining the program. The research intended to determine the factors of HPV vaccination program acceptability comprised of age, education level, knowledge, perception, and doctor recommendation. The research design was quantitative-based cross-sectional from January – May 2020. The population study was elementary schoolgirls' parents in Badung Regency. The respondents were 92 parents who were selected based on two strata and using simple random sampling. The source of primary data was collected through interviews and online questionnaires. It was analyzed with descriptive and analytical techniques with a logistic regression test. The result showed that 64,13% of respondents accepted the HPV vaccination program. The multivariate analysis showed that the perceived barrier was the most influential factor towards the acceptability of the HPV vaccination program (AOR = 6,056; 95%CI 1,754-20,906). Education would be needed to decrease the barriers to the HPV vaccination program.

Introduction

Cervical cancer is the third most common disease that causes death in women. As much as 85% of deaths in women due to cervical cancer occur in developing countries (Khan, M, et al, 2021). In Indonesia, cervical cancer has an incidence rate of 23.4 per 100,000 population with an average death rate of 13.9 per 100,000 population. In 2018, the prevalence of cervical cancer in Bali Province was 2.3 per mile (Kementerian Kesehatan RI, 2018). In 2016, in Badung Regency, there were 238 new cases of cervical cancer (Dinas Kesehatan Kabupaten Badung, 2019).

Cervical cancer is the growth of abnormal cells in the lining of the cervix or cervix. Cervical cancer is caused by the Human Papilloma Virus (HPV). The main types of HPV that cause cervical cancer are types 16 and 18 causing precancerous lesions. It can be prevented with

the HPV vaccine, clinically proven to be safe and effective. The HPV vaccine has an efficacy of 96% – 98% in preventing cervical cancer caused by HPV types 16 and 18 (Siddhart, A.R., et al, 2021). HPV vaccination is recommended to be given to adolescent girls starting at the age of 11-12 years as prevention before being sexually active and potentially exposed to HPV (Escobar, B, et al, 2021).

Concerning efforts to prevent cervical cancer cases in Badung Regency, the government has held a free HPV vaccination program since 2012. In 2020, the Badung District Health Office will focus on the vaccination program only at the elementary school level. So primary school level vaccination coverage must be optimized. The target coverage of the free HPV vaccination program in Badung Regency is 99% per school (Dinas Kesehatan Kabupaten Badung, 2019).

The implementation of the HPV

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vaccination program in the Badung Regency still has problems. Even though it has been provided free of charge by the government, there are still some parents of elementary school students who do not give consent for their daughters to participate in the HPV vaccination program. For two consecutive years, in 2017 and 2018, the realization of vaccination achievements was still lower than the number of targets. In 2017 there were 6%. While in 2018 by 4% did not receive the HPV vaccination. In the South Kuta Health Center area, 11 schools have coverage below the target (< 99%). Three of them have low coverage (33.33% – 66.67%). It shows that the program has been implemented in each of these schools, but there are groups of pros and cons to the implementation of free HPV vaccination. Two schools have HPV vaccination coverage of 0% (Dinas Kesehatan Kabupaten Badung, 2019).

The non-achievement target is closely related to the lack of acceptance of HPV vaccination by parents. In the implementation of HPV vaccination, written consent is required as an acceptance of the vaccination program. At the age of elementary school children, they are classified as underage so that the decision is still in the hands of the parents. Therefore, people have a vital role (Newman, *et al* 2018). In addition, the HPV vaccination program has not yet become a mandatory vaccination program from the Ministry of Health of the Republic of Indonesia, so it requires parental consent (Dinas Kesehatan Kabupaten Badung, 2019). Parental acceptance of HPV vaccination is essential to achieve high vaccination coverage. According to research that has been done that the reason parents do not receive HPV vaccination is that they think that HPV vaccination increases early sexual activity in their daughters (Lee, *et al.*, 2018; Robbins & Timothy, 2010)

Factors that influence parental acceptance of HPV vaccination are knowledge about cervical cancer and HPV vaccination (Rodriguez, *et al.*, 2019), perceived susceptibility, perceived severity, perceived benefits, perceived barriers, the experience of obtaining doctor's recommendations, age, and level of care. parent education (Degarege, *et al.*, 2019; Newman, *et al.*, 2018; Zhang, 2013)(2. This study is based on the absence of

previous studies that have examined the factors that influence the acceptance of the HPV vaccination program by parents of elementary school students using logistic regression analysis in the South Kuta Health Center area. We used regression analysis because it has an easier mathematical calculation and does not have many assumptions that must be met. Based on this, the researchers are interested in researching logistic regression analysis of the factors that influence the acceptance of the Human Papilloma Virus (HPV) vaccination program by parents of elementary school students in the South Kuta Health Center area in 2020.

Method

The design of this study was cross-sectional with a quantitative approach. The factors studied consisted of age, education level, knowledge, perceived vulnerability, perceived severity, perceived benefits, perceived barriers, and doctor's recommendations. The target population in this study were all parents of elementary school students in Badung Regency, while the affordable population was parents of fifth and sixth-grade elementary school students in the South Kuta Health Center area in March-May 2020.

The calculation of the minimum sample size in this study was carried out using a two-proportion hypothesis test sample determination technique, obtained 30 samples. The researcher uses the Sample Size 2.0 application. The estimated minimum total sample size is 60 samples. 10% of the total sample is added to obtain 66 samples. Researchers used 92 parents of elementary school students. The sample selection used strata based on the elementary schools, which had low and high HPV vaccination coverage. We took three schools from each stratum. The sample selection used simple random sampling using a sample frame of absenteeism for grade 5 and 6 students. We collect the data through interviews and online questionnaires. The questionnaire used in this study was modified from Dethan & Suariyani (2017) and Madhivanan, et al. (2014) which has been tested for validity and reliability on 92 respondents of parents of fifth and sixth-grade elementary

school students. Data quantitative analysis used three data analysis techniques. They are univariable, bivariable with simple logistic regression, and multivariable with multiple logistic regression tests. This research has been declared ethically worthy by the Research and Development Ethics Commission of the Unud Medical Faculty/Sanglah Hospital with the number 2020.01.1.0313 on April 17, 2020.

Result and Discussion

Based on the descriptive analysis in Table 1, we can see that respondents aged > 35 years were 71.74%. 71.74% of respondents are female, while respondents with low education amounted to 59.78%. In this study, acceptance of the HPV vaccination program may involve the female respondents (mother) participation or male respondents (father). It related to the parents' decision based on the tendency of the largest shareholder in receiving vaccines for their daughters. Based on gender characteristics, the percentage of respondents who are female in this study is 71.74%. A study by Nickel, et al. (2017) in two countries shown similar results. In the United States (USA) and the United

Kingdom (UK), the proportion of female respondents is higher than male respondents. The percentage of female respondents who live in the USA is 68.7%, while those who live in the UK are 64.4% (Nickel, *et al.*, 2017). Research conducted in Thailand by Grandahl, et al. (2018) also mentions that most respondents are mothers. Because, in Thailand, mothers are often the decision-makers on matters relating to the health of their children (Grandahl, *et al.*, 2018). It shows that mothers play a role as the front line in determining the acceptance of the HPV vaccination program to protect the health of their daughters.

The acceptance of the HPV vaccination program in this study can be influenced by several factors. Following is a further discussion of the factors that influence the acceptance of the HPV vaccination program by parents of elementary school students.

Based on the data presented in Table 2, we can see that the respondents who received the HPV vaccination program in this study amounted to 64.13% of the total respondents. It shows that the acceptance of the HPV vaccination program in this study is still lower

Table 1 Respondents' Characteristics Description

Respondents' Characteristics	Frequency (n = 92)	Percentage (%)
Age		
≤ 35 years	26	28,26
>35 years	66	71,74
Gender		
Male	26	28,26
Female	66	71,74
Education		
Low	55	59,78
High	37	40,22

Source: Primary Data, 2020

Table 2 Acceptance of HPV Vaccination Program Description

Variable	Frequence (n=92)	Percentage (%)
Acceptance of HPV Vaccination Program		
Accept	59	64,13
Not Accept	33	35,87
Total	92	100

Source: Primary Data, 2020

than the target of HPV vaccination coverage in the Badung Regency (99%) even though it has been implemented free of charge. Increasing HPV vaccination coverage is certainly still needed to achieve the expected target. The results of this study are not much different from those conducted by Fu, et al. (2019) that respondents of African and American parents who received HPV vaccination were only 54.5% (Fu, *et al.*, 2019). Also shown in a study conducted in Italy by Della, et al. (2020) that respondents whose children have been vaccinated against HPV are 57.9% (Della, *et al.*, 2020). Another study conducted in South Africa by the Senate & Dolamo (2018) also showed that 53% of respondents received HPV vaccination (Senatla & Dolamo, 2018). It shows that low acceptance of HPV vaccination by parents can occur in various parts of the world.

Based on the results of the bivariable analysis in Table 3, four variables have a significant relationship with the acceptance of the HPV vaccination program, namely age, knowledge, perceived benefits, and perceived barriers ($p < 0.05$). Based on the age variable, parents aged > 35 years were 5.9 times more likely to receive the HPV vaccination program than those aged 35 years (OR = 5.90; 95%CI 2.20-15.80). Similar research results were also shown by Lee, et al. (2017) that age was significantly associated with acceptance of HPV vaccination ($p = 0.046$) (Lee, *et al.*, 2017). The same thing in the research conducted by Siamanta, et al. (2018) found age is significantly associated with receipt of HPV vaccination ($p = 0.01$) (Siamanta, *et al.*, 2018).

A person's age can cause differences in their experience of health problems or diseases and decision-making (Noor, 2000). The results of this study indicate that older respondents have a higher acceptance of the HPV vaccination program than those who are younger. It can happen because with the increasing age, the experience, knowledge, and wisdom in making decisions are getting better. This statement is in line with Hudhah (2017) that the age of the respondent who has increased can increase the experience in parenting so that it affects the prevention and control of disease (Hudhah, 2017). The study's results also showed that the percentage of parents aged > 35 years was more

than those aged 35 years, which was 71.74%. It is in line with research conducted by Saqer, et al. (2017) that respondents aged > 35 are 64% (Saqer, *et al.*, 2017). It shows that most respondents' parents have more experience and knowledge in preventing cervical cancer through HPV vaccination.

Based on the knowledge variable, parents who have a good level of knowledge about cervical cancer and the HPV vaccine are 4.21 times more likely to receive the HPV vaccination program (OR = 4.21; 95%CI 1, 70-10.43). Respondents with good knowledge have a higher probability of receiving the HPV vaccine than respondents with poor knowledge. Aligned with the research conducted by Yuen, et al. (2018) showed parents who have good knowledge of cervical cancer have a 1.88 times greater tendency to receive HPV vaccination (OR = 1.88, 95%CI 1, 22 - 2.90) (Yuen, *et al.*, 2018). A similar study conducted by Nickel, et al. (2017) also proved that the knowledge that parents have about HPV is a factor that influences vaccination acceptance ($p < 0.001$). Similar to the study conducted by Wang, et al. (2018) that parents of daughters with good knowledge of HPV were 4.97 times more likely to receive HPV vaccination than those who had less (OR = 4.97; 95%CI = 1.35 - 18.37) (Wang, *et al.*, 2018). A study conducted in Yogyakarta Province, Indonesia by Sitaresmi, et al. (2020) showed that knowledge about cervical cancer and HPV vaccination had a significant relationship with acceptance of HPV vaccination ($p < 0.001$) (Sitaresmi, *et al.*, 2020). It shows that the better the knowledge and understanding possessed by the respondents, the greater awareness of the importance of taking preventive measures and the motivation to accept the HPV vaccination program.

The interviews with several respondents shown they got health education or promotion held in schools before the HPV vaccination program was carried out. Most parents understand that cervical cancer can be prevented with HPV, thus increasing interest and becoming the basis of motivation to take a stand to accept the HPV vaccination program. However, some indicators have not been properly understood by parents. The indicators like the number of doses received,

the recommended age for receiving the vaccine, the type of vaccine, and the side effects caused. Based on the results of the distribution of answers in the questionnaire.

Based on one of the theories that underlie this research, the HBM theory stating that knowledge exists before perception formation and can have an indirect effect on attitudes by influencing perceptions of vulnerability, perceived severity, perceived benefits, and perceived barriers (Snelling, 2014). The additional analysis showed that there was a significant relationship between knowledge and perceived severity and knowledge and perceived barriers. Respondents having good knowledge tend to be 2.59 times higher to have a high perception of severity (OR = 2.59; 95% CI 1.11-6.03). Meanwhile, respondents who have good knowledge tend to be 7.88 times higher to have a low perception of barriers (OR = 7.88; 95% CI 2.76-22.48). It suggests that it is possible to describe the relationship between knowledge and attitudes towards the acceptance of the HPV vaccination program not only as simple as logistic regression analysis but requires an analysis that considers the direct and indirect relationships between variables.

Based on the analysis results, the respondents' parents' good knowledge about cervical cancer and HPV vaccination was 55.43%. It shows that the proportion of respondents with good knowledge and poor knowledge is almost equal in proportion. It shows that although health promotion efforts have been carried out, the percentage of respondents with good knowledge is not too high. So, health education is still needed with materials and media easily understood by ordinary people and, of course, interesting.

Based on the perceived benefit variable, it was shown that parents who had a high perceived benefit were 4.05 times more likely to receive the HPV vaccination program compared to those with a low perceived benefit (OR = 4.05; 95% 1.22-13). ,37). The variable perception of benefits regarding HPV vaccination was significantly associated with acceptance of the HPV vaccination program. Respondents who have a high perceived benefit are more likely to receive the HPV vaccination program. These results are aligned with The

Health Belief Model (HBM) theory proposed by Rosenstock (1974) explaining that individual perceptions of the benefits or benefits obtained affect the choice of healthier behavior, namely in this study acceptance of the HPV vaccination program (Snelling, 2014).

A study by Wang, et al. (2018) proved that parents with a high perceived benefit were 1.48 times more likely to receive HPV vaccination than those with a low perceived (OR = 1.48; 95%CI 1.18-1.85) (Wang, *et al.*, 2018). Similar results in a study by Degarege, et al., (2019) finding that parents who had a high perceived benefit were 1.48 times more likely to receive the HPV vaccine compared to parents who had a low perceived benefit (= 0.39, OR = 1.48, $p < 0.001$) (Degarege, 2019). Research conducted by Madhivanan, et al. (2014) also stated that parents who considered HPV vaccination the right way to protect their daughters from cervical cancer were 8.95 times more likely to receive the HPV vaccine (OR = 8.95, 95%CI 3.15-25,45) (Madhivanan, et al., 2014). Research by Yuen, et al. (2018) mentioned parents who consider the benefits of the HPV vaccine to protect their daughters from HPV infection are 3.16 times more likely to receive HPV vaccination than those who do not, to protect their daughters from HPV infection (OR = 3, 16, 95%CI 1.39-7.15) (Yuen, et al., 2018). It shows that the more benefits parents and their daughters got when vaccinating against HPV, the greater the desire to receive the HPV vaccination program. In this study, the benefits obtained may include the effectiveness of the HPV vaccine, the assurance of the safety of the HPV vaccine, and the ease of accessing the program in schools Particularly, when the program is implemented free of charge. It aligned with the research of Lin, et al. (2020) that parents' desire to vaccinate HPV is higher in those who perceive that HPV vaccination has satisfied effectiveness. Therefore, the perception of the benefits of HPV vaccination to prevent cervical cancer is a primary factor influencing parents' willingness to vaccinate their daughters (Lin, et al., 2020).

The perceived barrier variable showed that parents who had low perceived barriers were 5.21 times more likely to receive the HPV vaccination program than those with high

barriers perceptions (OR = 5.21; 95%CI 1.99-13.65). The variable perception of barriers to cervical cancer is significantly related to the acceptance of the HPV vaccination program. Respondents with low perceived barriers are more likely to receive the HPV vaccination program. The results are following The Health Belief Model (HBM) theory proposed by Rosenstock (1974). It explains that an individual's perception of performing a certain behavior will result in a negative impact that can affect individual behavior change (Snelling, 2014).

Based on qualitative research conducted in Utah, United States by Warner, et al. (2014), parents who are respondents feel they are not informed about the HPV vaccine. The lack of information obtained by parents is an obstacle to vaccinating their children. In addition, the majority of parents perceive that the vaccine can cause serious complications or side effects. Parents are worried that their children will have free sex as a consequence of the HPV vaccine. So they are reluctant to receive the HPV vaccine. On the other side, the views and emotional side of teenagers are considered. Some who do not participate in the HPV vaccination program are reported to be afraid of the pain caused by injections. It has a vital role in influencing parents' decisions (Yuen, et al., 2018). This study shows that the greater the number of obstacles and negative impacts obtained when vaccinating HPV, the lower the desire to receive the HPV vaccination program. In this study, these barriers could include side effects after HPV vaccination, discrepancies with beliefs, too young a child, and concerns about injections. This statement is also supported by research by Warner, et al. (2014) and Grandahl, et al. (2014) that the higher and more barriers parents perceived, the more reluctant they are to receive HPV vaccination for their children (Grandahl, et al., 2014; Warner, et al., 2014).

Based on the results of the bivariable analysis in Table 3, four variables do not have a significant relationship with the acceptance of the HPV vaccination program, namely education level, vulnerability perception, severity perception, doctor's recommendation ($p > 0.05$). The education level variable showed no significant relationship with the acceptance

of the HPV vaccination program. In a study conducted by Saqer, et al. (2017) also showed that education level was not correlated with willingness to receive the HPV vaccine ($p > 0.05$) (Saqer, et al., 2017). The research conducted by Zhang, et al. (2013) obtained different results that education level was associated with acceptance of HPV vaccination ($p = 0.009$). In this study, respondents with low levels of education do not necessarily have broad insights. Insights, information, and knowledge can be obtained not only through formal but can also from non-formal education. Nowadays, it is easy to access reliable information through the internet and mass media. The research of Grandahl, et al. (2017) also shows a similar event that the internet is the primary source of information for parents to obtain information about HPV (Grandahl, et al., 2017). Based on the results of this study, it is also shown that the percentage of respondents with higher education is less than those with low education, which is 40.22%. A similar study, also shows that higher education has a lower percentage, which is 29.1% (Maric, 2018).

The variable perception of susceptibility to cervical cancer does not have a significant relationship with the HPV vaccination program acceptance. Similar results in a study conducted in Alabama by Litton, et al. (2011) that the perception of susceptibility does not have a significant relationship with the desire to receive HPV vaccination ($p > 0.05$) (Litton, et al., 2011). In a study conducted by Madhivanan, et al. (2014), the items on the perception of susceptibility were not significantly related to the acceptance of HPV vaccination. Namely the belief in the likelihood that their daughters would be exposed to HPV in the future (OR = 1.31; 95%CI 0.78-2.22), belief in the probability that their daughter will be at risk of HPV infection (OR = 1.07; 95%CI 0.66-1.74), and belief in the probability that their daughter will develop cervical cancer one day (OR = 1.47; 95%CI 1.09-2.32) (Madhivanan, et al., 2014) 530,000 women are diagnosed with cervical cancer and 275,000 die annually. India bears the greatest burden of the disease with 132,000 cases and 74,000 deaths yearly. Widespread uptake of human papillomavirus (HPV). Research by Grandahl, et al. (2017) also

showed that the perception of susceptibility was not significantly associated with acceptance of HPV vaccination ($p > 0.05$) (Grandahl, *et al.*, 2017). There are also different research results, namely a study conducted by Degarege, *et al.*, (2019) which stated that parents who believed that their daughters were susceptible to HPV infection and cervical cancer were significantly associated with the desire to receive HPV vaccination ($p < 0.01$) (Degarege, *et al.*, 2019).

The absence of a relationship between perceived susceptibility and acceptance of the HPV vaccination program in this study could be due to the respondent's lack of understanding about the susceptibility of his daughters to HPV and cervical cancer, as evidenced by the low percentage of respondents with good knowledge in this study. Based on the results of the analysis, it was shown that there were quite some respondents who had high susceptibility perceptions, but among them still did not receive the HPV vaccination program (30.87%). It allows for other factors to be considered by parents in accepting the program. Even though in the bivariable analysis, the perception of vulnerability did not have a significant relationship, the p-value of the perceived vulnerability variable was still eligible to be included in the multivariable analysis ($p < 0.25$).

The severity perception variable about cervical cancer does not have a significant relationship with the acceptance of the HPV vaccination program. In a study conducted in Alabama by Litton, *et al.* (2011) that perceived severity has no significant relationship with the desire to receive HPV vaccination ($p > 0.05$) (Litton, *et al.*, 2011). In a study conducted by Madhivanan, *et al.* (2014) also stated that the item in the perception of severity, namely the belief that cervical cancer is a dangerous disease, was not associated with receiving HPV vaccination (OR = 1.42, 95% CI 0.74-2.72) (Madhivanan, *et al.*, 2014) 530,000 women are diagnosed with cervical cancer and 275,000 die annually. India bears the greatest burden of the disease with 132,000 cases and 74,000 deaths yearly. Widespread uptake of human papillomavirus (HPV). Research conducted by Grandahl, *et al.* (2017) also showed similar results that perceived severity was not

significantly associated with acceptance of HPV vaccination ($p > 0.05$) (Grandahl, *et al.*, 2017). Other studies show different results, namely one conducted by Wang, *et al.* (2018) that parents with a high level of severity perception are 1.39 times more likely to receive HPV vaccination compared to parents with a low level of severity perception (Wang, *et al.*, 2018).

The absence of a relationship between perceived severity and acceptance of the HPV vaccination program in this study could be caused by the respondent's lack of understanding about the cervical cancer severity, as evidenced by the low percentage of respondents with good knowledge in this study and that knowledge affects perceptions of severity. The analysis results show that there were quite some respondents who had a high perception of severity. But some of them still did not receive the HPV vaccination program (32%). It allows for other factors to be considered by parents in accepting the program.

The absence of a relationship between doctor's recommendations and acceptance of the HPV vaccination program in this study could occur because nowadays in obtaining sources of information, especially health, of course, it does not only come from doctor's recommendations. In a study by Saqer *et al.* (2017), respondents consider media such as TV, the internet, and the work or school environment to be the largest sources of information. The highest source of information was from TV, such as knowledge about cervical cancer (51.6%), HPV (35%), and HPV vaccine (34.5%) compared to other sources of information (Saqer, *et al.*, 2017). A study conducted by Grandahl, *et al.* (2017) also mentioned that parents use mass media and the internet as the primary source of obtaining information about HPV vaccination (Grandahl, *et al.*, 2017). Therefore, there is a possibility in this study that the same thing happened, namely more respondents and trusting information obtained through the internet and mass media.

Based on the bivariable analysis described earlier, five factors met the requirements to be included in the multivariable analysis consisting of age, knowledge, perceived vulnerability, perceived severity, and perceived benefit ($p < 0.25$). Based on the results of multivariable analysis using the forward variable selection

Table 3 Bivariabel Analysis of Factors Affecting HPV Vaccination Program Acceptance

Variable	HPV Vaccination Program Acceptance			OR	95%CI	p Value
	Accept (n=59)	Not Accept (n=33)	Total			
Age						
≤ 35 years	9 (34,62%)	17 (65,38%)	26	Ref		
> 35 years	50 (75,76%)	16 (24,24%)	66	5,90	2,20-15,80	0,00
Education Level						
Low	37 (67,27%)	18 (32,73%)	55	Ref		
High	22 (59,46%)	15 (40,54%)	37	0,71	0,30-1,69	0,44
Knowledge						
Poor	19 (46,34%)	22 (53,66%)	41	Ref		
Good	40 (78,43%)	11 (21,57%)	51	4,21	1,70-10,43	0,00
Vulnerability Perception						
Low	16 (53,33%)	14 (46,67%)	30	Ref		
High	43 (69,35%)	19 (30,87%)	62	1,98	0,81-4,86	0,14
Severity Perception						
Low	25 (59,52%)	17 (40,48%)	42	Ref		
High	34 (68%)	16 (32%)	50	1,45	0,61-3,40	0,40
Benefit Perception						
Low	5 (35,71%)	9 (64,29%)	14	Ref		
High	54 (69,23%)	24 (30,77%)	78	4,05	1,22-13,37	0,02
Barrier Perception						
Low	10 (37,04%)	17 (62,96%)	27	Ref		
High	49 (75,38%)	16 (24,62%)	65	5,21	1,99-13,65	0,00
Doctor Recommendation						
Accept	22 (59,13%)	15 (40,54%)	37	Ref		
Not Accept	37 (67,27%)	18 (32,73%)	55	0,71	0,30-1,69	0,44

Source: Primary Data, 2020

method ($p = 0.25$), the results are presented in Table 4 which shows that three factors influence the acceptance of the HPV vaccination program, namely age, perceived susceptibility, and perceived barriers. Based on the age factor, parents aged > 35 years were 6,044 times more likely to receive the HPV vaccination program compared to parents aged 35 years (AOR = 6,044; 95%CI 1,824-20,021). Similar research results were shown by Lee, et al. (2017) that age was significantly associated with acceptance of HPV vaccination ($p = 0.046$) (Lee, et al., 2017). The same thing in the research conducted by Siamanta, et al. (2018), age is significantly

associated with receipt of HPV vaccination ($p = 0.01$) (Siamanta, et al., 2018). A person's age can cause differences in their experience of health or disease problems and decision-making. The results of this study indicate that older respondents have a higher acceptance of the HPV vaccination program. It can happen due to the increasing age, experience, knowledge, and wisdom in better decisions making. This statement is in line with Hudhah (2017) that the age of the respondent who has increased can increase the experience in parenting so that it affects efforts to prevent and control the disease (Hudhah, 2017).

Based on the bivariable analysis described earlier, five factors met the requirements to be included in the multivariable analysis consisting of age, knowledge, perceived vulnerability, perceived severity, and perceived benefit ($p < 0.25$). Based on the results of multivariable analysis using the forward variable selection method ($p < 0.25$), the results are presented in Table 4 which shows that three factors influence the acceptance of the HPV vaccination program, namely age, perceived susceptibility, and perceived barriers. Based on the age factor, parents aged > 35 years were 6,044 times more likely to receive the HPV vaccination program compared to parents aged ≤ 35 years (AOR = 6,044; 95%CI 1,824-20,021). Similar research results were shown by Lee, et al. (2017) that age was significantly associated with acceptance of HPV vaccination ($p = 0.046$) (Lee, et al., 2017). The same thing in the research conducted by Siamanta, et al. (2018), age is significantly associated with receipt of HPV vaccination ($p = 0.01$) (Siamanta, et al., 2018). A person's age can cause differences in their experience of health or disease problems and decision-making. The results of this study indicate that older

respondents have a higher acceptance of the HPV vaccination program. It can happen due to the increasing age, experience, knowledge, and wisdom in better decisions making. This statement is in line with Hudhah (2017) that the age of the respondent who has increased can increase the experience in parenting so that it affects efforts to prevent and control the disease (Hudhah, 2017).

Based on perceived barrier factors, parents with low perceived barriers were 6,056 times more likely to receive the HPV vaccination program than parents with high perceived barriers (AOR = 6.056; 95%CI 1.754-20.906). There is a study that shows similar results, namely one conducted by Degarege, et al., (2019), stating that parents who have a low perception of barriers have a 1.67 times greater tendency to receive HPV vaccination compared to parents who have the perception of a high barrier (Degarege, 2019) "ISSN" : "18732518", "abstract" : "The study examined factors that affect parental intention-to-vaccinate adolescent daughters with HPV vaccine in Mysore district, India. A cross-sectional study was conducted among 1609 parents of

Table 4 Multivariable Analysis of Factors Affecting HPV Vaccination Program Acceptance

Variable	Final Model			p Value
	Adjusted OR	95% CI for AOR		
		Lower	Upper	
Age				
≤ 35 years	Ref			
> 35 years	6,044	1,824	20,021	0,003
Knowledge				
Poor	Ref			
Good	1,236	0,385	3,972	0,721
Vulnerability Perception				
Low	Ref			
High	3,179	1,007	10,030	0,048
Benefit Perception				
Low	Ref			
High	2,667	0,604	11,789	0,196
Barrier Perception				
High	Ref			
Low	6,056	1,754	20,906	0,004

Source: Primary Data, 2020

adolescent girls attending schools in Mysore District between February 2010 and October 2011. A validated questionnaire was used to assess parental attitudes, beliefs related with HPV infection, cervical cancer, HPV vaccine and vaccination in general. Structural equation modeling was used to estimate parameters and assess whether a model based on the integrative behavior theory would fit the current data. More than two-thirds (78.0%). In this study the greater the number of obstacles and negative impacts obtained when vaccinating HPV, the lower the desire to receive the HPV vaccination program. These barriers in this study could include side effects after HPV vaccination, discrepancies with beliefs, too young a child, and concerns about injections. This aligned with Warner, et al. (2014) and Grandahl, et al. (2014). The higher and more barriers parents perceived, the more reluctant they are to receive HPV vaccination for their children (Warner, et al., 2014; Grandahl, et al., 2014).

From the factors mentioned, the perceived barrier variable is the most influential in the HPV vaccination program acceptance. The factors in this study affect the HPV vaccination program acceptance by 26.13%. While 73.87% were by other factors. The limitations of this study are the data collection process using online questionnaires causing the possibility of information bias. There is also the possibility of recall bias, namely errors in remembering and reporting experiences that respondents have experienced, such as their daughter's HPV vaccination status and experience receiving doctor's recommendations.

Conclusion

Based on the characteristics of the respondents, the percentage of respondents aged > 35 years was 71.74%. Female respondents are 71.74%. Respondents with low education amounted to 59.78%. The percentage of respondents who received the HPV vaccination program was 64.13%. There are three factors that affect the acceptance of the HPV vaccination program, namely age, perceived susceptibility, and perceived barriers. The most influential factor in the acceptance of the HPV vaccination program is the perception

of barriers.

References

- Degarege, A., Krupp, K., Fennie, K., Srinivas, V., Li, T., Stephens, D.P., & Madhivanan, P., 2019. An Integrative Behavior Theory Derived Model to Assess Factors Affecting HPV Vaccine Acceptance Using Structural Equation Modeling. *Vaccine Journal*, 37(7), pp.945–955.
- Dinas Kesehatan Kabupaten Badung., 2019. *Cakupan Kegiatan Vaksinasi di Kabupaten Badung*. Kabupaten Badung.
- Escobar, B., Amboree, T.L., Sonawane, K., Deshmukh, A.A., McGee, L.U., Rodriguez, A.M., Jibaja-Weiss, M.L., 2021. Human Papillomavirus Awareness among Foreign- and US-born Hispanics United States 2017-2018. *Preventive Medicine Reports*, 22, pp.1–6.
- Fu, L.Y., Zimet, G.D., Latkin, C.A., & Joseph, J.G., 2019. Social Networks for Human Papillomavirus Vaccine Advice Among African American Parents. *Journal of Adolescent Health*, 65, pp.124–129.
- Grandahl, M., Paek, S.C., Grisurapong, S., Sherer, P., Tydén, T., & Lundberg, P., 2018. Parents' Knowledge, Beliefs, and Acceptance of The HPV Vaccination in Relation to Their Socio - Demographics and Religious Beliefs : A Cross - Sectional Study in Thailand. *PLOS ONE Journal*, 13(2), pp.1–17.
- Grandahl, M., Tydén, T., Westerling, R., Nevéus, T., Rosenblad, A., Hedin, E., & Oscarsson, M., 2017. To Consent or Decline HPV Vaccination : A Pilot Study at the Start of the National School-Based Vaccination Program in Sweden. *Journal of School Health*, 87(1), pp.62–70.
- Kementerian Kesehatan RI., 2018. *Laporan Hasil Riset Kesehatan Dasar (Riskesdas) Indonesia Tahun 2018*. Riset Kesehatan Dasar 2018, pp.182–183.
- Khan, M., Zafar, A., Muneer, R., Siddiqui, A., Khan, S.A.K., & Zafar, A., 2021. Knowledge, Attitude, and Practices Regarding Cervical Cancer and Human Papilloma Virus (HPV) Vaccination. *Pakistan Journal of Medicine and Dentistry*, 10(2), pp.94–100.
- Lee, Y.M., Riesche, L., Lee, H., & Shim, K., 2018. Parental HPV Knowledge and Perceptions of HPV Vaccines Among Korean American Parents. *Applied Nursing Research*, 44, pp.54–59.
- Lin, Y., Su, Z., Chen, F., Zhao, Q., Zimet, G.D., Alias, H., He, S., Hu, Z., & Wong, L.P., 2020. Chinese

- Mothers' Intention to Vaccinate Daughters Against Human Papillomavirus (HPV), and Their Vaccine Preferences: A Study in Fujian Province. *Hum Vaccin Immunother*, 17(1), pp.1–12.
- Litton, A.G., Desmond, R.A., Gilliland, J., Huh, W.K., & Franklin, F.A., 2011. Factors Associated with Intention to Vaccinate a Daughter against HPV: A Statewide Survey in Alabama. *Journal of Pediatric and Adolescent Gynecology*, 24(3), pp.166–171.
- Madhivanan, P., Li, T., Srinivas, V., Marlow, L., Mukherjee, S., & Krupp, K., 2014. Human Papillomavirus Vaccine Acceptability Among Parents of Adolescent Girls: Obstacles and Challenges in Mysore, India. *Preventive Medicine*, 64, pp.69–74.
- Maric, G., Birčanin, Đ., Kisić, V., Dotlić, J., Zarić, M., Kisić-Tepavčević, D., & Gazibara, T., 2018. Parental Perspective on Human Papillomavirus (HPV) Vaccination in Serbia: Knowledge, Attitudes, and Practice. *Sexual and Reproductive Healthcare Journal*, 16, pp.192–198.
- Newman, P.A., Logie, C.H., Lacombe-Duncan, A., Baiden, P., Tepjan, S., Rubincam, C., Doukas, N., & Asey, F., 2018. Parents' Uptake of Human Papillomavirus Vaccines for Their Children: A Systematic Review and Meta-Analysis of Observational Studies. *BMJ*, 8(4), pp.1–15.
- Polla, G.D., Pelullo, C.P., Napolitano, F., & Angelillo, I.F., 2020. HPV Vaccine Hesitancy Among Parents in Italy: A Cross-Sectional Study. *Human Vaccines & Immunotherapeutics*, 16(11), pp.1–8.
- Rodriguez, S.A., Mullen, P.D., Lopez, D.M., Savas, L.S., & Fernández, M.E., 2019. Factors Associated with Adolescent HPV Vaccination in The U.S.: A Systematic Review and Multilevel Framework to Inform Intervention Development. *Sensors & Actuators: B. Chemical*, 131, pp.127–177.
- Saqer, A., Ghazal, S., Barqawi, H., Babi, J.A., AlKhafaji, R., & Elmekresh, M.M., 2017. Knowledge and Awareness about Cervical Cancer Vaccine (HPV) Among Parents in Sharjah. *Asia Pacific Journal of Cancer Prevention*, 18(5), pp.1237–1241.
- Senatla, K.T., & Dolamo, B., 2018. Knowledge Attitudes and Behavior of Parents towards Human Papillomavirus (HPV) Vaccine in Prevention of Cervical Cancer in Adolescent Girls in Botswana. *Virology and Immunology Journal*, 2(10), pp.1–9.
- Vengadassalopathy, S., 2021. Assessment of Knowledge, Attitude and Practice regarding HPV Vaccination and Cervical Cancer Among Medical Students of a Tertiary Care Hospital in Chennai, Tamil Nadu. *Annals of Romanian Society for Cell Biology*, 25(4), pp. 13714–13725.
- Sitairesmi, M.N., Rozanti, N.M., Simangunsong, L.B., & Wahab, A., 2020. Improvement of Parent's Awareness, Knowledge, Perception, and Acceptability of HPV Vaccination After An Educational Intervention. *BMC Public Health*, 20(1836), pp.1–18.
- Snelling, A., 2014. *Introductions to Health Promotion*. San Fransisco, AA., USA: John Wiley and Sons.
- Wang, Z., Wang, J., Fang, Y., Gross, D.L., Wong, M.C.S., Wong, E.L.Y., & Lau, J.T.F., 2018. Parental Acceptability of HPV Vaccination for Boys and Girls Aged 9–13 Years in China – A Population-Based Study. *Vaccine Journal*, 36(19), pp.2657–2665.
- Warner, E.L., Lai, D., Carbajal-Salisbury, S., Garza, L., Bodson, J., Mooney, K., & Kepka, D., 2014. Latino Parents' Perceptions of the HPV Vaccine for Sons and Daughters. *Journal of Community Health*, 40(3), pp. 387–394.
- Yuen, W.W.Y., Lee, A., Chan, P.K.S., Tran, L., & Sayko, E., 2018. Uptake of Human Papillomavirus (HPV) Vaccination in Hong Kong: Facilitators and Barriers Among Adolescent Girls and Their Parents. *Plos One*, 13(3), pp.1–15.