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The Predictors Influencing the Mothers Health Beliefs and Intentions Towards the Determination of their Daughter to be Vaccinated with the Human Papillomavirus Vaccine in the Indigenous Communities, St. Vincent and the Grenadines

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Abstract

Since the integration of the HPV vaccine in the National Immunization Programme in 2017, little is known regarding Vincentian mothers' health beliefs, attitudes and intentions. Human Papillomavirus (HPV) infection can cause cervical cancer however, this can be prevented with the HPV vaccine which is given to girls in grade 6. The study aimed to evaluate mother's health beliefs, attitudes and intentions towards HPV vaccine administration to their daughter and factors involved with these intentions in Indigenous Communities in St. Vincent and the Grenadines. An online-based community cross-sectional survey was conducted in the six main villages in the Indigenous Community from April to May 2020. The structured and pilot-tested questionnaire was distributed to 342 mothers who had a daughter age 7-11 years old who were not vaccinated with the HPV vaccine and the youngest daughter if the mother has more than one daughter in the age group. Bivariate and multiple logistic regression analyses were used for data analysis to investigate factors associated with mothers' intention. For health beliefs and attitudes, descriptive analysis was performed.

Majority of the respondent had positive attitudes towards the HPV vaccine and for health beliefs there was a high susceptibility, severity and benefit towards HPV and the HPV vaccine among the mothers included there was a high (95.6%) maternal intention for their daughter to received the HPV vaccine, with 9 out of every 10 mothers agreeing to have their daughter be vaccinated in the future. The factors influencing the intention of vaccinating were the source of information-health professionals (AOR=

10.14, 95% CI= 2.88-35.60), high health beliefs (AOR= 3.35, 95% CI= 1.03-12.20), knowing women with cervical cancer (AOR= 5.05, 95% CI= 1.50-16.95), education- primary and secondary (AOR= 4.62, 95% CI= 1.31-16.24) and ethnicity- Indigenous (AOR= 4.13, 95% CI= 1.02-16.69), employed mothers (AOR=2.32, 95% CI =1.36- 3.96), and high level of knowledge towards HPV and HPV vaccine (AOR=2.27, 95% CI =1.25- 4.13), employed mothers (AOR=2.32, 95% CI =1.36- 3.96) were significantly associated with mothers' health belief towards HPV vaccination (p-value<0.01). Health professionals are an important source of HPV and HPV vaccine, therefore, they must be knowledgeable with updated information to promote the HPV vaccination using a multifaceted and culturally sensitive approach among key populations to improve uptake. There will be the need for intervention to increase awareness and health education about HPV and the HPV vaccine by health professionals.

Keywords: Mothers' Intentions; Mothers' Health Beliefs; Indigenous Communities; St. Vincent And The Grenadines; HPV; HPV Vaccine

Introduction

Cervical cancer is caused by sexually acquired infection with certain types of Human Papillomavirus (HPV). Types 16 and 18 of HPV can cause cervical cancers and pre-cancerous cervical lesions up to 70% [1]. In 2018, the global estimation of new cases deaths by cervical cancer by WHO were 570,000 and more than 85% of these deaths were from low and middle- income countries [1]. The WHO also reported in 2019 that cervical cancer is the second ordinary cancer among women in less developed regions.

The Pan American Health Organization also reported that yearly, approximately 56,000 women in Latin America and the Caribbean are defined to have cervical cancer with about 28,000 deaths [2], moreover, cervical cancer was the second regular cancer among women in St. Vincent and the Grenadines by noticing from during 2012-2016, it represented 6.8% of all cancer morbidity and it was the third major cancer from 2011 to 2016 in this country [3]. The risk of HPV infections were also detected to be high when compared to other countries in the Caribbean like Barbados and Curacao for about 29.6% of sexually active women aged >30 years with the most common high-risk genotypes being 45, 35, 31, 18, and 51 [4,5]. For this reason, The World Health Organization has recommended a comprehensive cervical cancer control programme, across the life course along with the vaccination of girls 9-14 years before they become sexually active as the primary prevention [1].

St. Vincent and the Grenadines is a multi-island country established in the Eastern Caribbean with a total area of 389 km^2 and contained 32 islands, inlets, and cays. It was free from the British Dependency in 1979. The population account for approximately110,211 persons. Six main villages were found in the Indigenous Communities and the indigenous people were the third-largest population group in St. Vincent and the Grenadines [6]. Like other Caribbean Islands, this small island is found to have an epidemiological transmission of chronic non- communicable diseases such as neoplasms which killed 21% of people in 2015. In St. Vincent and the Grenadines, health care services accessibility such as the HPV vaccine is cost-free for the primary level (by forty health centers) and is with a minimal fee for the secondary care (by one main hospital) [6] corresponed to the high unemployment rate at 25.8% in 2017 [7] while the tertiary care services are provided by a modern diagnostics center.

To prevents the occurrence of cervical cancer to the target population in the future, the HPV vaccine must be administered to them. Inaccordance with the World Health Organization, the HPV vaccine was seen as worldwide enormous public health discovery which many countries have implemented it into their National Immunization program in both girls and boys [8,9] and up to 270 million doses were carried out [10]. Likewise 17 countries in the Caribbean sub-region, the HPV vaccine was administered throughout health-care and school-based facilities at the end of 2017 by using a gender-neutral strategy [11]. In the Vincentian context in 2017, the HPV vaccine was targeted at the girls in grade 6 after the consultations and sensitization, however, the coverage throughout the country still minimal (9.5%) [11]. Although childhood vaccinations in this place are cost-free with an estimated coverage of over 95% [12]. This might be because parents play a key role for the decision of their daughter to be vaccinated with the HPV vaccine principally mothers when compared to fathers [13-16]. Therefore, the understanding of mothers' health beliefs and attitudes regarding HPV vaccination is crucial to be used for the predictor of the HPV vaccine vaccination. From the report of some studies, parents who had foreseen the benefits of the vaccine against the disease were more likely to have their child be vaccinated [13,17,18], moreover, their attitudes also affected their intentions towards the HPV vaccine

[19-21]. Worlwide different findings were reported about factors influence mothers' intention on the HPV vaccination included knowledge, beliefs and health behaviours [22-26].

For this study, the Indigenous Communities were selected to conduct the study owing to the communities were geographically located in the country's extreme northeast tip and they were vulnerable to the country's La Soufriere volcano, for these reasons, the HPV vaccine was low coveraged in these areas [27].

The studies of mothers' health beliefs, attitude and intention involved with the decision of their daughter to be vaccinated by the HPV vaccine were conducted in many countries, however, not any study was investigated in St. Vincent and the Grenadines. Therefore, appropriate intervention is needed to be carried out in the local condition. The aim of the study was to determine mothers' health beliefs, attitudes and intentions towards the decision of their daughter to be vaccinated by the HPV vaccine in Indigenous communities in St. Vincent and the Grenadines and the factors involved with their intentions.

Materials and Methods

Theoretical Framework

Health Belief Model (HBM) was applied in this study to evaluate the health beliefs of the mothers regarding HPV and the HPV vaccine. This theory suggests that individual who gives the value of being healthy and willing to avoid illnesses will accept the health behaviors which prevent illness or reduce the risk of being ill through personal action. When an individual is willing to make change of their behaviors, they must confront with a health threat and find out the severity of the threat then they will discover that some exclusive health actions will bring many benefits to them but with little barriers such as the feeling of the recognition to maintain the internal or external behavior with the support [24-28]. For this study, this model gives a considerable concept for mothers' intention to have their daughter vaccinated against the cervical cancer which six main constructs were applied, include perceived susceptibility, perceived severity, perceived benefit, perceived barrier ,cues to action and modifying factors [29].

Study Design, Sample and Setting

This study was conducted in rural communities which were a main position of the Georgetown Health District. This is a cross-sectional descriptive study with inclusion criteria that are mothers who pleased to attend the study and had a daughter with aged between 7 and 11 or the youngest daughter (with aged between 7 and 11) in case the mother had more than one daughter with 7-11 years of age and the daughter had not yet be vaccinated with the HPV vaccine as well as their dwellings were in Indigenous communities.The study is not include mothers with a mental disability and mothers who had a daughter with aged between 7 and 11 but had alteady received the HPV vaccine. To suit the purpose of the study, to minimize the selection bias and due to the small sample size, all six villages contained 342 qualified households were chosen in the study.The data was collected by using a self-reported questionnaire and a Google E form between April and May 2020 owing to COVID 19 situation.

Ethical Consideration and Procedure

Ethics approval (Protocol Number MU-SSIRB: 2020/064.2503, dated March 25) were granted from the Committee for Research Ethic, Social Sciences, Mahidol University and permission was allowed from the Research and Ethics Committee in St. Vincent and the Grenadines prior to study onset. After receive the approval from the Mahidol University Committee Board, the researcher ditributed a study concept to the Research and Ethics Committee in St. Vincent and the Grenadines for an allowance to perform the study.

Data collection procedure was began by three well-trained research assistants carried out the pilot study within the study area started with 30 qualified mothers from 342 qualified households were selected by simple random sampling to attend the research. Before the data collection was took place, the researcher must be certained that all mothers were willing to participate in the study and the questionnaires were revision and correction to ensure the credibility, then, the participants were notifed that they can withdraw from the study at any stage without any consequence and they were received informed consent and they were described about the study content included the questionnaire will be answered in the English language via Google E form and the completed questionnaire was able to return on their own or to return automatically. However, mothers who did not have mobile phone or the internet, the research assistants would take an interview and complete the questionnaire at the study site by using social distancing. All information was kept confidential to protect their privacies.

Questionnaire

A structured questionnaire consisted of four sections with a total of 55 questions adapted and modified from the previous relevant published studies and survey instruments was utilized [17,24,30]. The content validity of the instrument was also validated by three public health experts who are

university lecturers. The first part: socio-demographic characteristics included childhood recommended vaccine and importance of religion (11 items), the second: internal characteristics included knowledge (11items), the third part external characteristics included preventive services utilization and source of information consisted of 6 questions. The final part consisted of health beliefs (14 items), and attitudes (11 items) towards HPV and HPV vaccine and intention to vaccinate 1 item.

A 5 point Likert scale was used for those questions regarding health beliefs about HPV and the HPV vaccine using the Health Belief Model, answers were ranged from 1 as "strongly disagree" to 5 as "strongly agree". A 7 point Likert scale was also used for the questions involved with attitude towards HPV and HP vaccine ranged from 1 as "strongly disagree to 5 as "strongly agree". For concerning knowledge, there were 11questions which the possible answers were true, false, and don't know. The "correct" answer was coded as '1' while "incorrect" and "don't know" answers got a score of '0', therefore,the propable total scores were between 0 and 11. Questionnaire reliability was computed by using Cronbach's alpha coefficient, consequently, the reliability scores of knowledge, health beliefs, and attitude were0.802 0.833, 0.802 respectively.

Measurement

For socio-demographic, recorded age of all mothers and their daughters were categorized into two groups based on the mean cut point while all marital status included single, married, separated /divorced, widow, and cohabiting were grouped into married and not married. Four groups of mothers 'occupations namely: Government Employee, Self-employed, Unemployed, Domestic Worker and Private Sector worker were categorized as employed and unemployed while educational levels were grouped into Primary and Secondary and College and higher. Ethnicity was classified as Indigenous and Non-indigenous and religion was classified as Traditional and Non-Traditional Christian whilst important and not important were identified for the issue of importance of religion to guide daily decisions. Childhood vaccine administration was categorized as all or some and none.

To determine health belief, the cut point was calculated using the mean score and the questions raised for health beliefs were susceptibility to HPV infection (2 items), severity to disease (2 items), perceived benefit (3 items), and perceived barriers (7 items). The average score and above demonstrated high health beliefs of HPV and HPV vaccination. For knowledge, three levels score were categorized including high (≥10), moderate (8-9) and low (< 7.). For attitude, the mean score was used to calculate the cut point and the numerical value from each mother was established. To determine an average score, the sum score was separated by all questions. The average score and over demonstrated a positive attitude towards the HPV vaccine vaccination. On the issue of intention towards vaccination 1 question was raised and the answer was restricted to Yes or No. Yes, meant a positive intention towards vaccination, while no meant a negative intention.

Data Management and Analysis

Data were firsly checked to see the integrity and conformity.SPSS 21.0 was used to access, clean and explore the data as well as analyze the data statistically. Sample characteristics were described by descriptive statistics included number and percentage for qualitative data. Mean, standard deviation or median, interquartile range for quantitative data. Bivariate analysis: chi-square test was utilized to determine the relationship between each independent variable and mother's intention regarding the HPV vaccination while multiple logistics regression was applied to indicate adjusted association among influencing factors and mother's intention regarding the HPV vaccine administration to their daughter.

Results

Demographic Characteristics

The total number of 342 mothers who had daughters age between 7 and 11 completed the questionnaire making the response rate 100% and Table 1 shows these findings. At baseline, the mean age of the young group of sample studied were 34 years. Most of the mothers were married (78.7%) and employed (76.8%). All (100%) of them were Christians and 56.4% viewed the religion as the consideration to make the decision. Among studied mothers, 79.5% were obtained primary or secondary education, while 20.5% had college and higher level of education. The distribution into ethnic groups showed 56.4% of Non- Indigenous and 42.7% of Indigenous. The majority (99.1%) mentioned that their daughter was vaccinated with all or some childhood vaccine. In terms of monthly income just over half (51.5%) of the mothers obtained low income while the others received high income as shown in Table 1.

Characteristics n=342	Number n=342	Percentage %
Mother age		
<34	167	48.8
≥34	175	51.2
Mean(SD)=34 (6), Min=20 Max=50		
Daughter age		
7 to 8	160	46.8
9 to 11	182	53.2
Mean(SD)=8 (1.4) Range =7-11		
Marital status		
Married	73	21.3
Not Married	269	78.7
Occupation		
Unemployed	79	23.1
Employed	263	76.9
Religion		
Non-Traditional Christian	204	59.6
Traditional Christian	138	40.4
Importance of religion (Christianity)		
Important	193	56.4
Not important	149	43.6
Education		
Primary and secondary level	272	79.5
College and higher degree	70	20.5
Ethnicity		
Indigenous	146	42.7
Not Indigenous	196	56.4
Daughter childhood vaccine		
Yes	339	99.1
No	3	0.9
Income		
< 700 (low income)	176	51.5
700 and more (high income)	166	48.5
Median(IQR)=700EC$(1000), Min=100EC$, Max=5000EC$		
Number of children		
1	82	24
2	128	37.4
3	132	38.6
Knowledge level		
High (≥8 score)	174	50.9
Low(< 8 score)	168	49.1
Mean(SD)= 8, (1.4) Min=0 Max=11		
Health Belief		

High (more than 3.5)	210	61.4
Low (< 3.5)	132	38.6
Mean 3.5		
Attitude		
Positive (more than 4.5)	227	66.4
Nagative (< 4.5)	115	33.3
Mean (4.5)		
Source of Information		
Health professional	267	78.1
Non health professional	75	21.9
Preventative Service Utilization Last medical check-up		
1-2 year interval	206	60.2
2-5 year interval	98	28.7
More than 5 year	38	11.1
Last papsmear		
1-2 year interval	128	37.4
2-5 year interval	141	41.2
More than 5 year	73	21.3
Diagnosis with cervical cancer		
No	339	99.1
Yes	3	0.9
Abnormal Pap smear		
Yes	30	8.8
No	312	91.2
Female relative with cervical cancer		
No	235	68.7
Yes	107	31.3
Knowing women with cervical cancer		
Yes	277	81
No	65	19

†1US$=2.67EC (monthly household income)

Table 1: Distribution of respondents according to Demographics and HPV-related Characteristics.

Description of Health beliefs and Attitude

Table 2 shows high mean score of mothers' health beliefs on the issue of susceptibility, severity, benefit and barrier for HPV and the HPV vaccine which were 4.39, 4.47, 4.31, 2.18, respectively.

Health Beliefs	n=342	
	Mean	Standard Deviation
Susceptibility of HPV and the HPV vaccine	4.39	0.87
Severity of HPV and the HPV vaccine	4.47	0.87
Benefit of HPV and the HPV vaccine	4.31	0.89
Barrier of HPV and the HPV vaccine	2.18	0.74

Table 2: Mothers'health beliefs in HPV and the HPV vaccine from the use of Health Belief Model.

For mothers'attitude towards the HPV vaccination, nearly to two-thirds of them had a positive attitude by noticing from the percentage of disagreement with the remarks No.1-4 in Table 3. Nonetheless, 69.9 considered the vaccine should be given at a later age and 22.2% still concerned about adverse effects of the vaccine. Sufficient information was also important for receiving the vaccine.

No.	Attitude Statement	Attitude		
		Diasagree	Uncertain	Agree
		%	%	%
1	I am opposed to vaccination in general (any Vaccine)	89.2	6.1	4.7
2	I am opposed to the HPV vaccination	86.8	6.4	6.7
3	I am concern if the vaccine has any adverse (harmful) effects	71.6	6.1	22.2
4	Having the HPV vaccine implies that my daughter will have more partners/ unprotected sex.	89.2	2.9	7.9
5	My daughter will be protected against cervical cancer after vaccination	14.6	4.7	80.7
6	It is necessary to also vaccinate boys with the HPV vaccine	11.7	6.4	81.9
7	The HPV vaccine should be given at a later age	22.5	7.6	69.9
8	If my daughter's doctor or nurse recommend the vaccine I will vaccinate her	7.3	5	87.7
9	The media influences my decision towards the HPV vaccination	17.3	6.4	76.3
10	Preventing HPV infection is important for my daughter	6.1	4.4	89.5
11	I have sufficient information about the HPV vaccine to decide whether my daughter will receive the vaccine	8.2	5.3	86.5

* p-value < 0.05 ** p-value < 0.01 *** p-value < 0.001

Table 3: The percentage of Mothers'attitude towards HPV vaccination.

Table 4 shows bivariate analysis results of independent variables and mothers' intention regarding the HPV vaccine. According to the results, education, source of information, knowing women with cervical cancer and low income were associated with mothers' intention regarding the HPV vaccine.

Variables	Intention to vaccinate						
	Yes		No		COR	95% CI	p-value
	n	%	n	%			
Education							
College and higher degree	63	19.3	7	46.7	1		
Primary and secondary level	264	80.7	8	53.3	1.28	(0.71-2.31)	0.015*
Source of Information							
Non health professional	64	19.6	11	73.3	1		
Health Professional	263	80.4	4	26.7	11.3	(3.49-36.64)	<0.001***
Knowing women with cervical cancer							
No	57	17.4	8	53.3	1		
Yes	270	82.6	7	46.7	5.41	(1.89-15.53)	0.002**
Ethnicity							

Non Indigenous	184	56.3	12	80	1		
Indigenous	143	43.7	3	20	3.11	(0.86-11.22)	0.083
Occupation							
Unemployed	76	23.2	3	20	1		
Employed	251	76.8	12	80	0.826	(0.23-3.00)	0.771
Income							
700 (High income)	154	47.1	12	80	1		
< 700 (low income)	173	52.9	3	20	4.49	(1.24-16.22)	0.022*
Attitude							
Negative	108	33	7	46.7	1		
Positive	219	67	8	53.3	1.77	(0.63-5.02)	0.28
Health Belief							
Low	123	37.6	9	60	1		
High	204	62.4	6	40	2.49	(0.87-7.16)	0.091
Knowledge							
Low	158	48.3	10	66.7	1		
High	169	51.7	5	33.3	2.14	(0.72-6.40)	0.174
				Last medical check-up			
1-2 year interval	198	60.6	8	53.3	1.38	(0.28-6.74)	0.695
2-5 year interval	93	28.4	5	33.3	1.03	(0.19-5.57)	0.97
More than 5 year	36	11	2	13.3	1		
Last papsmear							
1-2 year interval	124	37.9	4	26.7	1.8	(0.44-7.41)	0.417
2-5 year interval	134	41	7	46.7	1.11	(0.31-3.92)	0.872
More than 5 year	69	21.1	4	26.7	1		
Abnormal Pap smear							
Yes	29	8.9	1	6.7	1		
No	298	91.1	14	93.3	0.734	(0.09-5.78)	0.769
Female relative with cervical cancer							
Yes	104	31.8	3	20	1		
No	223	68.2	12	80	0.536	(0.148-1.94)	0.342

*p-value<0.05; ***p-value<0.001

Table 4: Bivariate analysis of explanatory variables and mothers' intention.

Predictors of Mothers Intention and Mothers' Health Beliefs Regarding the Administration of the HPV Vaccine to their Daughter

All related predictors were analized by using multiple logistic regression. The explanatory variables were keyed into the full model by using a backward method. As presented in Table 5, the significant factors were manifested with less than 0.05 p-value after OR was adjusted at 95% confidence interval. The predictors of mothers' intention in the final model were ethnicity, health beliefs, and sources of information, education, and knowing women with cervical cancer. And mothers' knowledge level towards HPV and HPV vaccine, employed mothers were significantly associated with mothers' health belief towards HPV vaccination.

Variables	AOR	(95% CI)		P-value
Mothers' intention to HPV Vaccination				
Knowing women with cervical cancer				
No	1			
Yes	5.05	1.5	16.95	**0.009****
Education				
College and higher degree	1			
Primary and secondary level	4.62	1.31	16.24	**0.017***
Ethnicity				
Non-Indigenous	1			
Indigenous	4.13	1.02	16.69	**0.047***
Health beliefs				
Low	1			
High	3.35	1.03	12.2	**0.044***
Source of information				
Non-health professional	1			
Health professional	10.14	2.88	35.6	**<0.001*****
Mothers' health beliefs towards HPV vaccination				
Knowledge level				
Low	1			
High	2.32	1.36	3.96	**0.002****
Occupation				
Unemployed	1			
Employed	2.27	1.25	4.13	**0.007****

* p-value < 0.05 ** p-value < 0.01 *** p-value < 0.001

Table 5: The prediction for mothers intention and mothers' health beliefs regarding the decision of their daughter to get vaccinated with the HPV vaccine by using multiple logistic regression. (The final model).

Discussion

Despite the fact that most HPV infections are able to get rid of on their own, the risk for all HPV infected women still be left over that lead them to have lesion of pre-cancerous and will proceed to have cervical cancer. For this issue, the WHO has suggested a universal method to deal with cervical cancer throughout the life course one of them is the primary prevention vaccination among the girls with aged 9-14 years [1]. This is the first study to the best of the investigators' knowledge to be done since the introduction of the HPV vaccine in St. Vincent and the Grenadines in 2017. The results of this study enhanced the understanding of mothers' health beliefs, attitudes, and intentions regarding the administration of the HPV vaccine to their daughter in Indigenous communities in St. Vincent and the Grenadines corresponded to the aim of the study.

For health beliefs of the HPV issue, the results were shown that there was a significant relation between mothers' intentions regarding the HPV vaccine and health beliefs and there was a high susceptibility, severity and benefits to HPV and the HPV vaccine among the mothers. Based on the result, mothers who had high health beliefs were able to have more 5 times of intention towards the HPV vaccine than those with low health beliefs since health beliefs of the vaccine protection cervical cancer in their daughter's directed them to have higher intentions. This finding was also corresponded to the existing studies conducted in Thailand, Korea and Japan [24,31,32]. Furthermore, the majority had a positive attitude regarding the vaccine, so it could be estimated that attitude also affected their intentions. These findings were similar to the previous studies conducted in Taiwan, Poland and Argentina which reported [19-21].

When viewed intention rate of mother regarding the HPV vaccine, the results were shown that intention rate in this study was ultimately high [12] which might be correlated with the campaign that enhanced the HPV vaccine vaccination in St. Vincent and the Grenadines and which was corresponded to other studies such as in China, 83.3% of mothers had intention to have their daughter be vaccinated with the HPV vaccine [33] while in Poland 85.1% of parents approved HPV vaccine vaccination [20] in the same way of Argentina which 90% of mothers approved this vaccine [34]. Moreover, in the existing studies mothers usually had the major role of the HPV administration to their daughter [35,36].

Ethnicity was found to be related to mothers' intention towards the HPV vaccine which 42.7% of mothers were Indigenous ethnicity**.** For multivariate analysis which compared Indigenous mothers with Non- Indigenous mothers (the major group), it was found that Indigenous mothers were able to have more 4 times of intention towards the HPV vaccine that was similar to the study from the United States which manifested the correlation between Hispanic ethnicity and intention amongst teenagers who did not get vaccinated [37]. The description for this result was those mothers were more susceptible to cervical cancer and they had little assess ability to high level of medical care. Apart from ethnicity, knowing women with cervical cancer was also involved with mothers' intentions. It was found that mothers who was acquainted with people who had cervical cancer were able to have more 5 times of an intention towards the HPV vaccine owing to they concerned their daughter with the exposure or vulnerability of cervical cancer.

This finding corresponded to some studies [31,38]. The result was also shown that the source of information was related to mothers' intention. Health care professionals' information and confirmation of the vaccine were made mothers probably had 10 times to have intention of having their daughter got vaccinated than information received from other sources which were corresponded to other studies from the United States [18,39,40]. Moreover, for bivariate and multiple logistic regression analyses, it was shown the relation between educational level and mothers' intentions. Mothers who completed higer education (college and higher degree) were able to have less 4 times of intention than those who completed lower education (primary or secondary level; 79.5%) owing to they proned to receive more information of HPV against HPV vaccine vaccination intentions that was corresponded to a study from the United States [37].

Strengths and Limitation

This study had many strenghts included this is the first study conducted in St. Vincent and the Grenadines to investigate mothers' intention regarding the HPV vaccine administration to their daughter according to the introduction of the HPV vaccine in 2017. A structured questionnaire and the theoretical Health Belief Model were used as research tools to evaluate the health beliefs of the mothers regarding HPV and the HPV vaccine to enhance the credibility of the results, moreover, all of the mothers who met the study criteria were selected as the sample and mothers had the rights of decision-making for their daugther to get vaccinated with the HPV vaccine. Nontheless, limitations were in sight in this study included this was a cross-sectional study, morever, this study investigated mothers who had daugther with age between 7 and 11, for this reason, the study results were not be able to generalize to other studies which investigated the mothers who had daugthers with younger or older age. In addition , owing to it was self-report, some incorrect information or over-reporting of sensitive facts and health behaviours such as income, pap smear screening and medical check-up were received from the participants.

Conclusion

From the research findings, it can be seen that intention from mothers in Indigenous communities towards HPV vaccine administration to their daughter in this study involved with ethnicity, education, health beliefsm, the source of information, and knowing women with cervical cancer. Moreover, most of them had high knowledge and health beliefs of the HPV and HPV vaccine, as well as positive attitudes towards the HPV vaccine. According to the ultimate prevalence (95.6%) of this intention from mothers, it can be summarized that maternal acceptance for the HPV vaccine is exceeding.

Recommendation

For the future researches, both the HPV vaccine coverage and educational intervention in the Indigenous communities and other rural areas are needed to be focused and coordinated by the Ministry of Health, Wellness, and the Environment as well as health professionals to increase awareness and to assess the advantage of health promotion on HPV and the HPV vaccine not just among mothers but all levels of influence–individual, family, community, and country and it should be done by using a multifaceted culturally sensitive approach to strengthen awareness, improve health knowledge, reduce HPV infections and HPV related cancer, and eventually influence behavior change to maintain the HPV vaccine uptake. Furthermore, a qualitative research should be investigated amongst mothers in Indigenous communities and other region of the country to have more comprehension about the obstacies and challenges regarding the HPV vaccine.

The Ministry of Health must also ensure that Health professionals keep scientific information up-to-date for general public to seek medical advice as our study revealed that most respondents trust their information. There also remains the need to develop/ review national HPV guidelines to ensure that they are based on the latest scientific evidence in agreement with WHO recommendation and to ensure that they meet the needs of key populations and other vulnerable groups like boys. Finally, a regular supply of the HPV vaccine must continue to be available at all health centers.

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