Original Article

doi:10.31674/mjn.2022.v14i01.09

MJN

Perceptions on Pediatric Vaccination and Adherence: A Study among Mothers in the Philippines

Earl Gene L. Maturan, Maria Jessica Erlinda P. Fabroa, Janet Alexis A. De los Santos*

College of Nursing, Visayas State University, Visca Baybay City, 6521 Leyte, Philippines

**Corresponding Author's Email: janetalexis.delossantos@vsu.edu.ph*

ABSTRACT

Aim: This paper aims to determine the mothers' perceptions on pediatric vaccination guided by the components of the Health Belief Model. It is likewise aimed to determine the correlation of the mother's perception to their vaccination adherence. **Methods:** This study utilized a cross-sectional design utilizing a self-report scale. Participants were mothers with children aged one year old and below, from Ormoc City, Philippines. **Results:** The study revealed that mothers' have high perceived threat (*m*=3.76, SD=0.77), perceived benefits (*m*=3.82, SD=0.84), and perceived self-efficacy (*m*=3.78, SD=0.79), towards vaccination. Similarly, cues to action revealed a high mean score of 3.86 (SD=0.88). On the other hand, factors such as financial (*m*=2.83; SD=1.06), personal (*m*=2.12, SD=1.02), Spiritual (*m*=2.29, SD=1.01), Geographical (*m*=2.172; SD=1.54), and Health Care Professional's Approach (m=2.26; SD=0.99) were not considered as a barrier among the participants. Among the perceptions identified, we found a positive correlation between a mother's perceived threat (*r*=0.290, *p*=<001), perceived benefits (*r*=0.147, *p*=0.001), and perceived self-efficacy (*r*=0.217, *p*=0.001) to their vaccination adherence. On the other hand, among the perceived barriers, only personal beliefs (*r*=1.78, *p*=<0.001) and the approach of health care providers (*r*=-0.096, *p*=0.038) revealed a significant negative relationship to a mother's adherence to vaccination. **Conclusion:** Related factors such as perceived threat, benefit, and self-efficacy are facilitative, while personal beliefs and negative approaches of health care personnel can be barriers to immunization. When a mother's perception outweighs their perceived barriers, they are more likely to submit to vaccination.

Keywords: Perceptions; Pediatric Immunization; Vaccination Adherence; Philippines

INTRODUCTION

Vaccination is a global health development initiative which aims to save lives yearly. Vaccines reduce the risks of contracting vaccine-preventable diseases by developing antibodies and strengthening the body's immune defense system. According to World Health Organization (WHO, 2020), there are approximately 146 million individuals composed of infants and children who are unvaccinated worldwide. Majority of these figures are from countries such as India, Nigeria, Congo, Pakistan, Indonesia, Ethiopia, Brazil, Angola, Mexico and the Philippines.

Remarkably, there was a notable increase in the trend of reported cases among two vaccine preventable diseases in the last two decades. The WHO Immunization dashboard reported that as of year 2020, there were 10,137, and 149,962 cases for diphtheria and measles respectively (WHO, 2022).

In the Philippines, the Expanded Program on Immunization (EPI) aims for equal access for all citizens to receive all appropriate vaccines. EPI was initiated by the WHO in collaboration with the United Nations Children's Fund (UNICEF) in the country to further develop vaccination programs all over the globe. The program's purpose is to ensure that newborns, infants and children received timely immunization to vaccine-preventable diseases in including tuberculosis, poliomyelitis, diphtheria, pertussis, tetanus, and measles (DOH, 2016).

Theoretical Framework

Anchored on the Health Belief Model (Champion

Received March 9, 2022; Received in revised form April 21, 2022; Accepted June 17, 2022

& Skinner, 2008), the nature of this study is to identify perceptions that affect mothers' adherence to the vaccination program of the DOH.

This model illustrates mothers' perceptions lead to the molding of their decision-making to admit their child for vaccination. These components are Perceived Susceptibility, Perceived Severity, Perceived Benefits, Perceived Self-Efficacy, and Cues to action. This model states that a person must believe that they are vulnerable to vaccine-preventable diseases to take action. Therefore, the importance of enforcement is calculated by the possibility that, in the mothers' opinion, compliance can minimize the perceived danger while being relatively inexpensive in terms of time, resources, and energy. As a result, the decision to take preventive measures is based on the mothers' assumption that her children are vulnerable, and that the disease's occurrence will have some profound medical implications. The premise here is that taking action decreases vulnerability.

Objectives of the Study

This study aims to determine mothers' perception in submitting their child for vaccination using the constructs of the health belief model. Additionally, it is aimed to assess the relationship between the mothers' perception towards vaccination and their vaccination adherence.

METHODOLOGY

Research Design

This study utilized a cross-sectional design using a self-report questionnaire.

Locale

This study was conducted in the City of Ormoc in Leyte, Philippines. Mothers with a child of one year old and below in their family were selected as respondents. Inclusion criteria also include at least five years residing to ensure they are familiar with the city's vaccination policies and guidelines.

Mothers diagnosed with mental disorders were excluded due to possible incoherence, posing invalid answers. Additionally, mothers with severe disabilities were excluded, as in most cases, the responsibility of accompanying their child for vaccination is relayed to others within their family relations.

Sampling

The researchers used a staged cluster sampling to gather the participants. The Ormoc City Health Office records served as bases in selecting our locale as the first stage of sampling. The districts which recorded the highest number of populations were included in the sample locale. To determine the samples, the given population of the selected communities using Slovin's formula were 229, and 238 were required from Linao and Valencia, respectively. All in all, the researchers had 467 samples for this study.

Research Instruments

Due to the lack of an existing scale specificity to the study, the researchers developed an instrument to gather the necessary data. Anchoring on the health belief model components, the literature was extensively reviewed to populate items in the scale. The raw scale underwent subject matter expert (SME) validation for face and content validity tests. It revealed an acceptable average scale validity index (S-CVI) of 0.82, suggesting the scale is composed of relevant and valid items. After which, the validated scale was pilot tested and revealed a high internal consistency based on the Cronbach alpha score of 0.90.

Data Analysis

Descriptive statistics was done using mean and standard deviation to quantify mothers' perceptions towards vaccination. Spearman rho correlational analysis was also performed to determine the strength of the relationship between the study variables.

Ethical Considerations

This study underwent technical and ethical review from the Visayas State University-College of Nursing Research Review Committee and was granted clearance to proceed with the code: RES-CON-S2020.02 issued on March 8, 2021. Each participant received a packet information sheet and an informed consent form. Respondents who were inclined to participate in this research signed their consent in the form and then were thoroughly briefed about the study's purpose, methods, privileges, advantages, and risks before data collection began and withdrawing their participation at any point during the interview. The participants were given a chance to contact the interviewer before the interview to settle any questions or concerns.

RESULTS

As evident from Table 1, mothers' perceived threat, perceived benefits, and perceived self-efficacy towards vaccination have a high mean value of 3.76 (SD=0.77), 3.82 (SD=0.84), and 3.78 (SD=0.79), respectively. Similarly, cues to action revealed a high mean score of 3.86 (SD=0.88). It can be understood from these findings mothers' perceptions of threat as to the susceptibility of their children and the severity of danger of these vaccine-preventable diseases. The participants consider themselves able to take their children for vaccination considering the beneficial effects it can afford. There are existing social sources that provide a positive view of vaccination.

On the other hand, the table presents the different perceived barriers to vaccination which include financial (m=2.83; SD=1.06), personal (m=2.12, SD=1.02), Spiritual (m=2.29, SD=1.01), Geographical (m=2.172; SD=1.54), and Health Care Professional's Approach (m=2.26; SD=0.99). Based on the results, most of the perceived barriers do not exist because of the low mean scores except for financial barriers, which were found to be midline.

Table 1: The Perceptions of Mothers on Vaccination Using the HBM Components

HBM Components	*M*	*SD*
Perceived Threat	3.76	0.77
Perceived Benefits	3.82	0.84
Perceived Self-efficacy	3.78	0.79
Perceived Barriers		
Financial	2.83	1.06
Personal	2.12	1.02
Spiritual	2.298	1.01
Geographical	2.172	1.54
Health Care Professional's approach	2.268	0.99
Cues to Action	3.86	0.88

The results of the correlation analysis revealed that there is a positive correlation between a mother's perceived threat (r=0.290, p=<001), perceived benefits (r=0.147, p=0.001), and perceived self-efficacy (r=0.217, p=0.001) to their vaccination adherence. On the other hand, among the perceived barriers, only personal beliefs (r=1.78, p=<0.001) and the approach of health care providers (r=-0.096, p=0.038) revealed a significant negative relationship to a mother's adherence to vaccination (Table 2).

Table 2: The Relationship of The Mothers' Perception of Vaccination and their Vaccination Adherence

	Perceived Threat	Perceived Benefits	Perceived Self-efficacy	Perceived Barriers				
				Financial	Personal Beliefs	Spiritual Beliefs	Geographical Location	Approach of Health Care Providers
VACCINATION ADHERENCE (*n*=467)	0.290**	0.147**	0.217**	0.059	-0.178**	-0.073	-0.087	-0.096*
	0.000	0.001	0.000	0.203	0.000	0.117	0.059	0.038

It can be seen that neighbors (r=0.144, p=0.002) and health care providers (r=0.132, p=0.004) are positively correlated with a mothers' vaccination adherence.

Table 3: The Relationship Between the Four Identified Cues to Action and Vaccination Adherence

Vaccination Adherence (*n*=467)	Cues to Action			
	Social Media	Family	Neighbors	Health Care Providers
Coefficient	0.019	0.010	0.144**	0.132**
***p*-value**	0.678	0.831	0.002	0.004

DISCUSSION

This paper aims to determine the perception among mothers to pediatric immunization and assess its relationship to their vaccination adherence.

The high mean scores in the participants' perceived threat indicate that they are concerned about their child's condition if they do not admit them for immunization. The participants are conscious of their child's susceptibility and the severity of these vaccine preventable infections. This finding is indicative of enough knowledge on the benefits as well as the ill effects of not getting their child vaccinated. This finding

is similar to the results of Alshammari *et al.*, (2018) which revealed that in most cases, the awareness of the dangers of getting sick from vaccine-preventable diseases improves the sense of danger and increases the likelihood of people complying with the vaccination program. This can be supported further by the study of Sunny *et al.*, (2018), which found how mothers become more inclined to get vaccinations when they have acknowledged the risks and dangers of vaccine-preventable diseases. In line with this behavior reflects mothers' high perceived benefits of vaccination. It can be understood from these findings that mothers' perception regarding vaccination as something beneficial for their children and should be given attention. These findings are further confirmed by Lee *et al.*, (2018), who claimed that when parents are well informed of the pros and potential benefits of vaccines, they display confidence and trust in the vaccine to get their child vaccinated. Once parents are made aware of the potential benefits, they are more likely to increase compliance with their child's immunization schedules.

Similarly, the high sense of self-efficacy indicates that the participants display a sense of control and commitment to accomplish vaccination for their children. This finding is similar to Mendel-Van Alstyne *et al.*, (2017) and Wani (2017), stating that instilling or strengthening parents' confidence in vaccines would increase their adherence to vaccination. Findings from the present study implies that vaccine-related information may influence parents' trust in vaccines. It can be said that the mothers know the importance of vaccinating their children from this data.

On the contrary, as seen from the table among perceived barriers, only the financial category is neutral compared to the other factors. Although not that remarkably high, finances may be a factor which may require further investigation to provide a possible issue as it may indicate loss of daily income. Nevertheless, these finding is like that of Gennaro *et al.,* (2021), where it was found that mothers' decisions may vary in considering finances as a factor in vaccination adherence.

The low mean score in personal belief indicates that the mothers do not have personal beliefs against vaccination. From this data, it can be said that the mothers do not believe that the vaccination is not safe for their child. This finding is in agreement with Wani, (2017), that showed that most mothers have a positive personal opinion on vaccination as both practical and necessary for their children's health. Moreover, our findings support the findings of Mendel-Van Alstyne *et al.*, (2017), who claimed that most mothers submit their children for vaccination on the belief that it is effective and safe for their children.

The component of spiritual belief as a barrier to vaccination was low in this study. It can be understood from these findings that the mothers do not have any spiritual beliefs that hinder them from adhering to vaccination. This is similar to the study of Bangura *et al*., (2020), which found that mothers' vaccine adherence is unaffected by their spiritual or religious beliefs because most religions promote vaccination. Thus it was inferred that the mothers' religions allow vaccination. In the participants' faith and spirituality, which is predominantly Roman Catholic, vaccination is not a prohibited practice. Understandably, most religions embrace vaccination and are believed to be beneficial and safe for children (Bangura *et al*., 2020).

The geographical location, which is considered a factor that could impact vaccination, was low among the participants in this study. It can be understood from these findings that the mothers have no problem regarding their geographical location in connection to their adherence to vaccination. A previous study by Eboreime *et al.*, (2015) demonstrated no significant link between geographical location and vaccination adherence. The findings suggest accessible and functional health facilities that offer vaccination in the participants community. This finding is in contrast with a study which found problems in vaccination compliance because of distant locations of health facilities in residential areas (Muathe *et al.*, 2020). According to the results of the Power (2009) study, most health centers provide immunization for children.

Lastly, it can be seen in the table that the health care professional's approach during vaccination is not perceived as a hindrance nor as a barrier to having their child vaccinated. The present finding is similar to that of Ridad, (2019) and Singh *et al.*, (2019) which found that the health care workers' approach and dedication to their work can increase the mothers' adherence to vaccination. It can be said that the health professionals are doing well with their roles as care providers.

Moreover, the results in Table 2 on the correlation of the key variables in the study mean that the perceived threat, perceived benefits, and self-efficacy are facilitative to a mother's compliance and adherence to vaccination. At the same time, a mothers' personal

beliefs and approaches of health care providers pose an inverse relationship to a mother's compliance with immunization.

This result is similar to that of the study by Jung *et al.*, (2021), which highlights that increasing levels of a perceived threat from illness often prompt compliance towards childhood immunization. It can be understood how mothers are aware of the risks and severity of the vaccine-preventable diseases, which prompts them to secure vaccination for their children.

Additionally, when mothers believe in the vaccine, they are more likely to comply with their vaccination schedules than their counterparts (Ulfah *et al.*, 2020). This behavior was found in the participants of this study. The mothers' perceptions of the vaccine's benefits increase their desire to have their child vaccinated. They are more inclined to give their children the vaccine upon knowing how it contributes to their children's health through immune system boosting.

The significant relationship as observed between perceived self-efficacy and vaccination adherence is similar to that of the study by Wang *et al.*, (2020), which found how perceived self-efficacy of the parents is contributory to their acceptance of vaccination. This suggests that compliance and adherence to vaccination schedules are relative to the mother's ability to perform such action. When mothers are confident in themselves and believe that they can devote time and effort to have their children vaccinated, they will be more likely to submit for vaccination.

Among the perceived barriers, only two were found to have a significant relationship: personal beliefs and health providers' approaches. The former suggests that when mothers set aside their personal beliefs, especially their biases against vaccination, they are more likely to adhere to their child's vaccination. This is similar to the study by Majid & Ahmad (2020) who found some in their research where parents at some point have doubts about the vaccine and have specific issues needing to be resolved, especially on matters relating to the safety of the product.

Similarly, the inverse correlation between the health care professional's approach towards the mothers' vaccination adherence was found to be significant. This suggests that when mothers feel that the health providers are unapproachable and uncaring, they are less likely to submit for vaccination. Other literature revealed that the critical role of health workers and their significant influence on people's vaccination decision-making (Tate *et al.*, 2019; Butt *et al.*, 2020). The attitude of the healthcare provider may influence the mothers' vaccine compliance.

This finding is somehow related to the results obtained in the relationship between healthcare providers as a cue to action on vaccination adherence. The positive relationship between these two factors indicates that health workers contribute to the likelihood of a mother getting their child vaccinated. Providing health education addresses questions that can even clear doubts and misconceptions. On the other hand, neighbors have a highly significant role in influencing a mother to submit to vaccination. Other parents' perceptions on vaccination has an influence and a deciding factor for a mother to submit to vaccination (Majid & Ahmad, 2020). Peers and actual people who share the same experience are vital in developing confidence and having their child vaccinated.

CONCLUSION

This study presented factors influencing mothers' perceptions (facilitators and barriers) and the different cues to action are related to their decision to vaccination. Related factors such as perceived threat, benefit, and self-efficacy are facilitative, while personal beliefs and negative approaches health care personnel can be barriers to immunization. When a mother's perception outweighs their perceived barriers, they are more likely to submit to vaccination. This implies the need to strengthen and sustain educational intervention through information drive on the advantages of vaccination. However, it is also necessary to implement strategies for minimizing barriers if not eradicated.

Conflict of Interests

The authors declare that they have no conflict of interest.

ACKNOWLEDGEMENT

This study would not be possible with only the labors of the researchers themselves, but also to the people who extended a helping hand in the process of making this study a reality. Firstly, a profound gratitude is expressed to the participants for their generosity in time to participate in the study. Second, to the barangay health workers for the assistance in locating research participants. Most of all, we would like to thank the VSU College of Nursing for the technical support and guidance for the completion of this study.

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