

**ORIGINAL RESEARCH**

## **BARRIERS TO ADHERENCE TO EXPANDED PROGRAM ON IMMUNIZATION AMONG PARENTS IN LANA DEL NORTE, PHILIPPINES**

**Geraldine Sabate Ridad\***

College of Nursing, Mindanao State University - Iligan Institute of Technology, Philippines

**\*Corresponding author:**

**Geraldine Sabate Ridad, MAN, RN**  
College of Nursing, Mindanao State University-Iligan Institute of Technology,  
A. Bonifacio Ave., Tibanga, Philippines  
Email: [geraldineridad@gmail.com](mailto:geraldineridad@gmail.com)  
Telephone: +63 (063) 221 0744

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**Abstract**

**Background:** The Expanded Program on Immunization (EPI) was developed to ensure access of infant and children to recommended vaccines. In the Philippines, nurses are deployed in the community to ensure that children in their assigned units are fully immunized before they reach 1 year old. However, despite the various immunization campaigns, many children still remain unprotected and at-risk to life-threatening vaccine-preventable diseases. Thus, identifying the barriers that have averted parents from adhering to complete and timely immunization is important, most especially to nurses who are the primary program implementers in the community.

**Objective:** This study chiefly aimed to determine the respondents' perceived barriers along the aspects of Personal, Geographical and Social Barriers, Beliefs and Myths on Immunization, and Knowledge and Awareness on EPI and their relationship to the respondents' level of adherence to immunization.

**Methods:** Descriptive correlational design was used to explore the perceived barriers to immunization and examine its relationship to the respondents' level of adherence. A researcher-constructed questionnaire was used after being pilot tested to gather data from 352 random respondents.

**Results:** Using frequency counts, percentages, and weighted arithmetic mean, the results showed that most of the respondents considered only geographical factors as barrier along with social factors. Moreover, it has been found out that respondents lacked knowledge and awareness on the benefits of immunization, the number of vaccines their child needs to receive, site and schedule, side-effects, and contraindications. However, with mean above 2.34 indicated that respondents were informed on the appropriate interventions for side-effects of vaccines, as well as their right to refuse vaccination. The respondents' over-all level of adherence was moderate.

**Conclusion:** The identified barriers geographical, social, personal, beliefs and myths on immunization and respondents' level of knowledge and awareness have influenced respondents' level of adherence to a moderate level only. Based on the results, health care providers, especially nurses, and other concerned program implementers need to consider and address these barriers when formulating or improving strategies to increase immunization compliance. Lastly, more intentional follow-up campaign drives in spreading information about Expanded Program on Immunization using media and other ways is needed.

**KEYWORDS**

barriers to immunization; expanded program on immunization; adherence to immunization

## INTRODUCTION

Every infant is entitled to the best possible protection against diseases. Obviously, they cannot take proper precautions, so family caregivers and health professionals must be responsible for them ([Klossner & Hatfield, 2006](#)). As vulnerable group, infants and newborns need to be vaccinated at an early age since their immune system is not yet mature making them more susceptible to childhood diseases ([Ashwill & James, 2008](#); [Cuevas, 2007](#)).

Immunization, according to the World Health Organization (2013), is the process by which vaccines are introduced into the body before infection sets in. Vaccines are one of the most successful and cost-effective public health interventions that the government's health system can provide to the poor and most vulnerable populations ([World Health Organization, 2013](#)). The Expanded Program on Immunization shortly known as EPI was developed to ensure the access of infants and children to the recommended vaccines. To ensure that all children in the Philippines are Fully Immunized Child (FIC), the Department of Health utilized several strategies such as the Reaching Every Barangay (REB) strategy adapted from WHO-UNICEF's Reaching Every District (RED) strategy, Supplemental Immunization Activity (SIA) to reduce the rate of missed children or drop outs from routine immunization, and lastly through strengthened disease surveillance. In addition, Republic Act No. 10152 mandated that infants and children under 5 years old should receive basic immunization ([Department of Health of the Republic of the Philippines, 2011](#)).

In the Philippines, nurses are deployed in rural and urban health units as key implementers of these strategies to ensure that children in their assigned areas are fully immunized. However, despite these efforts many children still remain unprotected and at-risk to life-threatening vaccine-preventable diseases. In fact, The United Nations International Children's Emergency Fund (2018) reported an alarmingly low and declining immunization coverage rates in the Philippines, from 89% in 2013 to 62% in 2015. The report revealed that increased incidence of rubella in 2011 and measles in 2014 were attributed to low immunization rates ([United Nations International Children's Emergency Fund, 2018](#)). In Lanao del Norte, a number of barangays have been noted to have low compliance to EPI ([Bacolod City Health Office, 2013](#); [Municipal Health Center of Kolambugan, 2013](#); [Municipal Health Center of Linamon, 2013](#)).

To improve adherence and expand EPI coverage is the utmost goal of the program, thus, identifying the specific factors that have averted parents from adhering to complete and timely immunization or the obstacles to immunizations inherent in a locality is important. Hence, this study chiefly aimed to determine the respondents' perceived barriers along the aspects of Personal, Geographical and Social Barriers, Beliefs and Myths on Immunization, and Knowledge and Awareness on EPI and their relationship to the respondents' level of adherence to immunization. Understanding and highlighting these barriers will guide the health care providers, especially community or public health nurses as the key and primary program

implementers, in formulating better strategies to increase immunization compliance.

## METHODS

### Study design

This study employed non-experimental research design, using descriptive quantitative design to describe the variables of the study. Correlational design was also used to examine the relationship between the respondents' perceived barriers and their level of adherence to immunization.

### Setting

This research was conducted in three (3) selected municipalities in Lanao del Norte, specifically, Linamon, Bacolod and Kolambugan. The researcher selected the top barangays of the respective municipalities with low compliance to EPI. This research was conducted between September – November 2013.

### Samples

The respondents of the study were parents residing in the selected municipalities of Lanao del Norte with low compliance to EPI. They have child/children aging one to three (1-3) years old. The respondent was either the mother or the father whoever is available during the data gathering process. There were a total of 2900 households or families with child/children aging one to three (1-3) years old from all the three (3) selected municipalities; 791 households from Linamon; 533 families from Bacolod; and 1576 from Kolambugan ([Bacolod City Health Office, 2013](#); [Municipal Health Center of Kolambugan, 2013](#); [Municipal Health Center of Linamon, 2013](#)). Sloven's formula was used to calculate the appropriate sample size of 352 total respondents from all the three (3) municipalities. Proportional stratified random sampling method was then used in selecting the final number of respondents per municipality. The researcher gathered 96 respondents from Linamon, 65 respondents from Bacolod and 191 respondents from Kolambugan. The feasibility of the barangays was also considered, like transportation means and safety.

### Instruments

A researcher-constructed questionnaire, based on related literature and studies, was used and served as the main instrument of the study. The sets of questionnaires were written in Cebuano and English. A pilot study was conducted to a smaller scale of respondents (10 respondents) with a questionnaire consisting of three parts. The first part is the Parent's Demographic Profile; the second part is the Barriers which include five subsets: (1) Personal, (2) Geographical, (3) Social Barriers to Immunization, (4) Beliefs and Myths on Immunization, (5) Knowledge and Awareness on the Adherence to EPI; and the third or last part comprises the Adherence of Parents towards EPI. The Cronbach's alpha ranges from 0.80-0.85 which indicates good level of internal consistency. The Personal, Geographical and Social Barriers, Beliefs and Myths on Immunization, as well as Adherence to

EPI were determined using a 4-point Likert Scale (1- Never, 2- Sometimes, 3- Often, 4- Always). The respondents' Knowledge and Awareness on EPI were determined using a 3-point Likert Scale (1- Undecided/ No Idea at all, 2- Disagree, 3- Agree).

#### Data analysis

Frequency counts and percentages were used to quantitatively describe the responses given by the respondents on the independent and dependent variables. The weighted arithmetic mean was used to determine the average value of the responses in each of the given questionnaire on the independent variables such as the barriers to adherence to immunization; and the dependent variable which is the adherence of parents to EPI. Pearson Product- Moment Correlation (Pearson  $r$ ) was used to determine the degree or extent of correlation between respondent's perceived barriers: personal, geographical and social barriers, beliefs and myths on immunization, and knowledge and awareness on EPI towards their adherence to immunization. Lastly, T-test was used to determine if the Pearson's correlation is significant or not. The null hypothesis: there is no significant relationship between the identified barriers and their adherence to Expanded Program on Immunization (EPI) was tested at 0.05 level of significance.

#### Ethical consideration

The researcher ensured that ethical protocols were followed before and during the data gathering process. Data gathering started after the approval of College Research and Ethics Committee (CREC). Communication letters were given to each selected barangays and Municipal Health Office in the selected municipalities of Lanao del Norte. This study utilized respondents that were amenable to be part of the study after voluntarily signing the informed consent form given during orientation. The respondents were assured that the data collected will be treated with full confidentiality and that it cannot be disclosed elsewhere, except for the intended study and indeed will not be used against them.

#### RESULTS

Majority of the respondents (75.28%) were females or mothers. The male population was only 24.72%. All of them belonged to the reproductive age; most (46.31%) belonged to the age bracket of 21-30 years old while those parents who were 31-40 years old composed 36.93% of the total respondents' population.

**Table 1** Respondents' Perception on Personal, Geographical, Social Barriers, Beliefs and Myths on Immunization as Barriers to their Adherence to EPI

Barriers to Adherence to EPI	Average Mean	Standard Deviation	Descriptive Rating
Personal Barriers	1.70	0.8625	Never
Geographical Barriers	2.07	0.9445	Sometimes
Social Barriers	1.81	0.8552	Sometimes
Beliefs and Myths on Immunization	1.68	0.9325	Never

Always 3.28-4.00 Often 2.52-3.27 Sometimes 1.76-2.51 Never 1.00-1.75

**Table 1** above summarizes the barriers to respondents' adherence to EPI. Among all the identified barriers, only the geographical and social barriers were considered by the respondents as hindrance to their full adherence to EPI. Under the geographical barriers, respondents perceived the lack of security guards or any local authorities on health centers raises safety concerns. Some respondents were afraid of going anywhere far away from their home or to the rural health unit because of clan feuds. Other factors identified were distance of the health center from respondents' house, problems with transportation, and that health centers being non-operational or closed most of the times. Among all the social factors, the respondents perceived the unavailability or lack of vaccines, especially the Rotavirus vaccine, and lack of financial sources as barriers.

Although beliefs and myths on immunization was not perceived as a barrier by most of the respondents, few of them oftentimes

believed that febrile child should not be immunized; a child may die due to immunization; and in what some elderly says that immunization is not effective since during their time it was not available yet they did not acquire life- threatening illnesses.

It is also important to take note that although the results revealed that majority never considered the issue of being guilty or ashamed going to the health center without money for donation as a personal barrier to their adherence, still few of the respondents were concerned on that aspect.

**Table 2** shows that the respondents' lack knowledge and awareness on the benefits of immunization, number of vaccines, site and schedule, side-effects and contraindications of immunization is considered a barrier to their full adherence to EPI. On the other hand, they are informed and knowledgeable on the acceptability and interventions for the Side-effects of Immunization.

**Table 2** Respondents' Knowledge and Awareness on EPI

Knowledge and Awareness on EPI	Average Mean	Standard Deviation	Descriptive Rating
Benefits of Immunization	2.01	0.9249	Disagree
Number of Vaccine, Site and Schedule of Immunization	2.20	0.8785	Disagree
Side-effects of Immunization	2.14	0.7633	Disagree
Contraindications of Immunization	1.92	0.7922	Disagree
Interventions for the Side-effects of Immunization	2.44	0.7680	Agree
Acceptability of Immunization	2.48	0.7820	Agree

**Table 3** Summary of the Respondents' Level of Adherence to EPI

Indicators	Mean	Standard Deviation	Descriptive Rating
Geographical, Social and Personal Aspects	2.87	0.9286	Often
Knowledge and Awareness Aspects	2.85	1.0176	Often
Acceptability Aspects	2.80	0.9731	Often
<b>Average</b>	<b>2.84</b>	<b>0.9731</b>	<b>Often</b>

Always 3.28-4.00 Often/ Moderate 2.52-3.27 Sometimes/ Low 1.76-2.51 Never/ None 1.00-1.75

**Table 3** portrays the respondents' level of adherence to EPI. The over-all mean of 2.84 means that the respondents' over-all level of adherence was moderate. This implies that most of the respondents' children have delayed or missed immunizations. Along the geographical, social, and personal aspects, most of the respondents' children were immunized in the health center regardless of completeness and timeliness and some often go to a private clinic or doctor for their children's immunization. Under the acceptability aspect, survey revealed that not all of

the respondents were willing to have their children immunized and health workers respected their decision. However, there were also few respondents that reported health workers being forceful and too persuasive. On the knowledge and awareness aspects, most of the respondents always bring their children's immunization record during each visit, many respondents have gaps or delays in their children's immunization, had their children fully immunized only after more than 1 year of age, and only a few children were immunized with Rotavirus.

**Table 4** Relationship between Geographical, Social, Personal Barriers, Beliefs and Myths to Respondents' Level of Adherence to EPI

Barriers	Adherence			
		Geographical, Social, and Personal aspects	Acceptability aspects	Knowledge and Awareness aspects
Geographical	r	0.12	0.12	0.12
	t-test	0.26	0.26	0.26
	interpretation	significant	significant	significant
Social	r	0.13	0.13	0.13
	t-test	2.45	2.45	2.45
	interpretation	significant	significant	significant
Personal	r	0.14	0.14	0.14
	t-test	2.65	2.65	2.65
	interpretation	significant	significant	significant
Beliefs and Myths	r	0.13	0.13	0.13
	t-test	2.45	2.45	2.45
	interpretation	significant	significant	significant

Level of Significance: 0.05

Critical Value: 1.98

As revealed on **Table 4**, the geographical, social, personal barriers, as well as the beliefs and myths were significantly related to respondents' level of adherence to EPI. This was because the r values ranged from very low to low correlation

and; when tested at 0.05 level of significance, the t-test values obtained were greater than the critical value of 1.98. This implies that the extent or level of respondents' adherence to EPI

was affected by geographical, social, and personal barriers; as well as beliefs and myths of respondents on immunization.

As reflected on **Table 5**, the respondents' knowledge and awareness on EPI were significantly related to their level of

adherence along the aspects of geographical, social, and personal; acceptability; and knowledge and awareness. Their lack of knowledge and awareness on EPI has influenced their level of adherence to a moderate level.

**Table 5** Relationship between Respondents' Knowledge and Awareness on EPI to their Level of Adherence

Knowledge and Awareness on EPI	Adherence								
	Geographical, Social, and Personal aspects			Acceptability aspects			Knowledge and Awareness aspects		
	r	t-test	interpretation	r	t-test	interpretation	r	t-test	interpretation
<b>Benefits</b>	0.17	3.23	significant	0.12	2.26	significant	0.13	2.45	significant
<b>Number of Vaccines</b>	0.12	2.26	significant	0.12	2.26	significant	0.12	2.26	significant
<b>Side-effects</b>	0.12	2.26	significant	0.12	2.26	significant	0.12	2.26	significant
<b>Contraindications</b>	0.13	2.45	significant	0.13	2.45	significant	0.13	2.45	significant
<b>Intervention</b>	0.11	2.07	significant	0.11	2.07	significant	0.11	2.07	significant
<b>Acceptability</b>	0.11	2.07	significant	0.11	2.07	significant	0.11	2.07	significant
Level of Significance: 0.05			Critical Value: 1.98						

## DISCUSSION

In this study, only the geographical and social factors were perceived by the respondents as barriers to their full adherence to EPI. However, all the four barriers: Geographical, Social, Personal, as well as the beliefs and myths on immunization were significantly related to respondents' level of adherence to EPI. Under the geographical barriers, respondents perceived the lack of security guards or any local authorities on health centers raises safety concerns. Some respondents were afraid of going anywhere far away from their home or to the rural health unit because of clan feuds. In the complex web of violence in Mindanao, people were more concerned on the prevalence of clan feuds or "*rido*". In fact, Lanao del Norte is one of the top four provinces with the highest number of rido incidence

(Torres, 2014). Another study affirms that lower levels of full age-appropriate immunization were found in children in whom the regular EPI schedule could likely not be followed due to specific war-related events impacting on the community. Such delays or misses in immunization represent an additional threat to children living in conflict areas (Senessie et al., 2007). Other factors identified were distance of the health center from respondents' house, problems with transportation, and that health centers being non-operational or closed most of the times; leaving the respondents no other choice than to go to the Municipal Health Center, which is kilometers away from them, if they wanted to have their children immunized. According to previous study, distance discourages future attendance (Schwarz et al., 2009).

Among the social factors, the respondents considered the lack of Rotavirus vaccine stock in the health center as the major factor that hampered them to avail complete immunization. Rotavirus vaccination was included in the routine immunization since 2012 in accordance to Republic Act 10152 to solve the problem of infants and toddlers dying from most severe episodes of rotavirus infection ([Department of Health of the Republic of the Philippines, 2012](#); [Palangchao, 2013](#)).

Most of the respondents never believed on beliefs and myths on immunization. This positive response can be attributed to the efforts of the barangay health workers, especially the community health nurses, who have pursued on —house-to-house visits in promoting the EPI in conformity to PD 996 and Republic Act 10152 ([Department of Health of the Republic of the Philippines, 2012](#)). Although beliefs and myths on immunization were not perceived as a barrier by most of the respondents, yet few still have misconceptions as mentioned above. This necessitates health teaching reinforcement. Vaccine myths influence parents' behavior and perception that vaccines are unsafe. It erodes confidence, causing them to refuse to have their children vaccinated ([Oidwai et al., 2007](#)).

Under Personal barriers, few of the respondents were concerned on the practice of giving donations in the health center. The need to protect one's pride and dignity is also affected by criticism from neighbors for seeking free services and by the type of reception clients are given at a health care facility. The long waits, the impersonal and sometimes disrespectful treatment from insensitive staff, the patronizing attitude conveyed in many health education messages, can all lead clients to feel they have to pay an emotional price for health care ([Coreil et al., 1994](#); [Topuzoğlu et al., 2006](#)).

The respondents' knowledge and awareness on immunization was also significantly related to their level of adherence. They are informed and knowledgeable on the acceptability and interventions for the Side-effects of Immunization. Health workers who educate parents on the side-effects and the corresponding suitable interventions would prevent panic, fear and confusion on the part of the parents and would promote independence ([Centers for Disease Control and Prevention, 2013](#)). The results of the study also indicate that respondents were aware of their right to refuse vaccination, however few reported that some health workers are being forceful and too persuasive. This implies the need of an in-depth study to explore this aspect of vaccination. Respecting a parent's decision with regards to immunization strengthens the bond of trust between provider and the parent ([Gesmundo, 2010](#)). However, strong objection of a parent against immunization perhaps indicate poor communication on the part of the health worker. Communication that is respectful, nonpatronizing, and nonconfrontational can help reassure parents and reduce vaccine hesitancy ([Harrington, 2011](#)).

Most of the respondents lack knowledge on the benefits of immunization, the number of vaccines, site and schedule, the side-effects, and contraindications of vaccines. This implies the need for exhaustive and clear education by health workers

regarding immunization. Mothers who have less health education from caregivers are less likely to have fully immunized children ([Tadesse et al., 2009](#)). Bondy et al. recommends improvement of knowledge transfer to mothers to increase immunization coverage ([Bondy et al., 2009](#)). As primary source of information, nurses and other health workers need to know how to access appropriate, factual or research-based information when recommending various immunizations to parents ([Ashwill & James, 2008](#)). Health workers frequently refuse to immunize children eligible to receive one or more immunizations, because of various fears and false beliefs -- that a sick child should not be vaccinated, that a child should not receive multiple vaccinations on the same visit, etc. This creates false contraindications causing delayed or missed immunization ([World Health Organization, 2009](#)).

## CONCLUSION

The identified barriers geographical, social, personal, beliefs and myths on immunization, and level of knowledge and awareness have influenced respondents' level of adherence to a moderate level only. Based on the results, health care providers, especially the nurses who are the key implementers of EPI in the community, and other concerned program implementers need to consider and address these barriers when formulating or improving strategies to increase immunization compliance. Despite the current efforts and strategies employed by the Department of Health, these barriers still occur, which implies the need to review these programs as well as extensive monitoring and surveillance of under-immunized or non-immunized children especially in the far-flung or conflict-affected zones as well as non-operational health stations. This entails government support in terms of manpower and other resources, which needs to be looked into. An in-depth study is also recommended to determine the factors or reasons why some health workers were perceived as being too forceful and persuasive on vaccination. The results also imply community health nurses' commitment to continuing professional development through trainings and such in order to boost their confidence in giving health education and provide reliable information on EPI; as well as in dealing with parents' reluctance, myths and misconceptions on vaccination. Lastly, more intentional follow-up campaign drives in spreading information about Expanded Program on Immunization using media and other ways is needed.

## Declaration of Conflicting Interest

None

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#### Author Contribution

This study is an original work of the corresponding author.

#### ORCID

Geraldine Sabate Ridad <https://orcid.org/0000-0003-3616-8676>

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