

# The Knowledge and Preparedness of Public Health Midwives of Most Affected MOH Areas in Kalutara on Maternal and Child Health During Disasters

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**Abstract:** In a disaster pregnant women and children are at a higher risk than other population, because they have special physical and psychosocial needs which require continued care despite the community circumstances. Therefore, it is essential a presence of an experienced health worker, who is more aware of disaster planning and preparedness to serve the needs of the pregnant women and children. Objectives are to assess the knowledge, preparedness and associated factors of Public Health Midwives in 3 mostly affected MOH areas on maternal and child care during disasters. Methods: Between July to September 2016, all PHM in 3 MOH areas, (total of 78) were selected for the study to collect data by a self-administered questionnaire. The participants were surveyed of their personal information, information about their field, history of disasters occurred in their field, knowledge on maternal and child care in disasters, level of disaster preparedness and trainings received on disaster management. The knowledge and preparedness were analyzed in relation to the socio-economic and demographic characteristics of the participants. Results: The study results revealed that only 47.3% of PHMs were having a good knowledge on maternal and child care during disasters and especially they need to improve the knowledge in natal care, new-born care and infant care. Relatively they had a good knowledge on antenatal care and child care. There was no significant association between the age, educational level, field experience, MOH area and facing of disasters in the past with the knowledge, which reflects that every one should have a good knowledge in disasters in spite of any circumstances. The preparedness for disasters among the study population was 33.8% and most of them didn't think of the possible disasters that can happen in their fields and didn't have a response plan. The level of preparedness was not significantly associated with other factors like age, educational level, field experience, MOH area or previous exposure to disasters. 58.1% of the participants were not learned about disaster management in any instance in their service period and 94.6% not participated in any training programme. Conclusion & Recommendation: The PHM in 3 MOH areas should be promoted to get further educational qualifications to upgrade their knowledge. They should be encouraged to gain more knowledge and preparedness on disasters by giving service appreciation and awards for that field.

**Keywords:** Disasters, Disaster Preparedness, Maternal & child Care During Disasters, Reproductive Health in Disasters, Infant Feeding in Emergencies, Grass Root Health Care Worker

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## 1. Introduction

Disaster is a serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources [1]. Between 1990 and 1999, more than 2 billion people were affected by natural or technological disasters; these disasters led to 600,000 deaths [2]. There are a variety of disasters that include drought, floods, landslides, tsunamis, and epidemic-related disasters. In Sri Lanka 2004 Tsunami killed over 35,000 people and initially displaced up to 1 million people [3]. The floods and landslides in 2014 caused 27 deaths and a total of 104,476 people (25,538 families) were affected in eleven districts [4].

When disasters strike, women are often the most affected. They account for more than 75% of displaced persons and are at an increased risk for domestic violence and sexual assault [5]. Also, the prenatal care and delivery can be challenging given the poor facilities and the lack of necessary equipment for emergencies. Pregnancy complications and childbirth in unsafe conditions increase maternal and infant morbidity and mortality. Surviving newborns and pregnant women are more vulnerable to infections, hypothermia, dehydration, and diarrheal diseases due to the disruptions in the supply of clean water for drinking and bathing, inadequate access to safe food, exposure to environmental toxins, interruption of health care, crowded conditions in shelters, and disruption of public health and clinical care infrastructure; many are traumatized by the loss of family, community, and support systems. Pregnant women may be more susceptible to premature deliveries and miscarriages as well. It is critical that support systems and supplies should be in place to meet the special needs of survivors.

Therefore, health workers with experience in maternal and newborn care should be available to serve the needs of survivors. There should be temporary health facilities stocked with supplies and necessary equipment and a good referral system to evacuate any woman or newborn displaying danger signs. In Sri Lanka the Public Health Midwife is the grass root level health care worker who provides the domestic maternal and child care and addresses the basic needs of them. In a crisis situation they need to be more aware and help to empower the pregnant women and children with knowledge of how to handle their special needs in alteration of routine setup.

## 2. Justification

Bulthsinhala, Palindanuwara and Madurawala are the most affected and highly vulnerable MOH area in Kalutara district for floods even with small scale rain fall (disaster management plan, RDHS – Kalutara 2015/16). As it is highly identified and prioritized in all agendas of my area government institutes, providing health services become top of the list concerning the impact that hampered to people by disasters. Similar type of

research study was previously conducted by a Post graduate trainee in Health sector disaster management in NIHS training area, we are using that questionnaire, which had been developed for her study. Using the similar questionnaire in our instance gives us an additional advantage, where we can compare our level of knowledge among PHM with model area in training institute of NIHS.

## 3. General Objective

To assess the knowledge and preparedness of Public Health Midwives in 3 highly affected MOH areas of Kalutara, in maternal and child care during disasters.

### Specific Objectives

To assess the knowledge of Public Health Midwives in maternal and child care during disasters.

To assess the preparedness of Public Health Midwives during disasters.

To describe selected factors associated with knowledge and preparedness on maternal and child care during disasters of Public Health Midwives.

## 4. Literature Review

In this chapter, published literature on different type of disaster preparedness, knowledge on disasters and maternal and child care services during disasters had been reviewed. Key words used for literature searching included; Disasters, Disaster preparedness, maternal care during disasters, child health during disasters.

Many define disaster as a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources [6, 7]. Disasters are often described as a result of the combination of: the exposure to a hazard; the conditions of vulnerability that are present; and insufficient capacity or measures to reduce or cope with the potential negative consequences. Disaster impacts may include loss of life, injury, disease and other negative effects on human physical, mental and social well-being, together with damage to property, destruction of assets, loss of services, social and economic disruption and environmental degradation. UNISDR states disaster preparedness as the knowledge and capacities developed by governments, professional response and recovery organizations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions [8]. Preparedness action is carried out within the context of disaster risk management and aims to build the capacities needed to efficiently manage all types of emergencies and achieve orderly transitions from response through to sustained recovery.

During a Disaster situation, emergency IEF is mainly concerned with, early initiation of exclusive and continued breastfeeding in breast fed infants, minimising the risks of

artificial feeding in non-breast-fed infants, appropriate and safe complementary feeding in all infants and young children and nutritional, mental & physical well-being of mothers [8]. According to WHO “The fundamental means of preventing malnutrition among infants and young children is to ensure their optimal feeding and care” [9]. Usually, no food or liquid other than breast milk is required to meet an infant’s nutritional requirements during the first 6 months of life. After this period, infants should be given a variety of foods rich in energy, in addition to breast milk, to meet their changing and increasing nutritional requirements. Breast milk provides protection from infection and its consequences, which is really important in environments like a camp site with inadequate basic facilities (water supply, sanitation, shelter etc).

Following are the 10 WHO guiding principles for feeding infant and young children during an emergency [9].

Infants born into populations affected by emergencies should normally be exclusively breastfed from birth to 6 months of age.

The aim should be to create and sustain an environment that encourages frequent breastfeeding for children up to two years or beyond.

The quantity, distribution and use of breast-milk substitutes at emergency sites should be strictly controlled.

To sustain growth, development and health, infants from 6 months onwards and older children need hygienically prepared and easy to eat and digest foods that nutritionally complement breast milk.

Caregivers need secure uninterrupted access to appropriate ingredients with which to prepare and feed nutrient-dense foods to older infants and young children.

Because the number of caregivers is often reduced during emergencies as stress levels increase, promoting caregivers coping capacity is an essential part of fostering good feeding practices for infants and young children.

The health and vigor of infants and children should be protected so they are able to suckle frequently and well and maintain their appetite for complementary foods.

Nutritional status should be continually monitored to identify malnourished children so that their condition can be assessed and treated, and prevented from deteriorating further malnutrition’s underlying causes should be investigated and corrected.

To minimize an emergency’s negative impact on feeding practices, interventions should begin immediately. The focus should be on supporting caregivers and channeling scarce resources to meet the nutritional needs of the infants and young children in their charge.

Promoting optimal feeding for infants and young children in emergencies requires a flexible approach based on continual careful monitoring.

There are several manuals released by IFE core group on infant feeding in emergencies. Which consists of WHO Guiding Principles for Feeding Infants and Young Children during Emergencies (2004), Infant Feeding in Emergencies–Module 1 for emergency relief workers (2008) [10], Infant Feeding in Emergencies-For Health and Nutrition Workers in

Emergency Situations-Module 2 (2007) [11], UNHCR Guidance on Infant feeding and HIV in the Context of Refugees and Displaced Populations (2008), HIV and Infant Feeding: New Evidence and Programmatic Experience (2006). These itself highlight the real importance of infant feeding in emergency/disaster situations with special emphasis on HIV related problems.

Although much less have been published literature on maternal and child care during disasters, several studies on disaster preparedness among various types of health workers have been done all over the world. A study done in US after the Hurricane Katrina in 2005 on “Health Concerns of Women and Infants in Times of Natural Disasters: Lessons Learned from Hurricane Katrina” states that the Percent low birth weight, very low birth weight, percent preterm is high in Hurricane affected areas [12]. Post-Hurricane Katrina surveillance in Colorado found that 3% of emergency room visits by Katrina evacuees were for obstetric reasons and 13–15% of evacuee households were in need of services related to the special supplemental nutrition program for Women, Infants, and Children (WIC), birth control and reproductive health, and child care.

## 5. Methodology

Study design: Descriptive cross-sectional study

Study setting: Bulathsinhala, Palindanuwara, Maduarawala MOH areas.

Study period: July to September 2016

Criteria for eligibility: The Public Health Midwives in all 3 MOH areas

Exclusion and inclusion criteria:

Inclusion criteria: All Public Health Midwives in above mentioned MOH areas having at least 6 months service period in public health

Exclusion criteria: And Public Health Midwives in 3 MOH areas who are on leave for more than 1 month at the time of data collection

Sampling method: No specific sampling method. All the PHMs in 3 MOH areas was recruited for the study.

Sample size: All Public Health Midwives in 3 MOH areas were recruited for the study. There were 87 PHMs in that area.

Study Instrument: A pre tested self-administered questionnaire was used.

Validation of the questionnaire: Questions were constructed to achieve the specific objectives. Questionnaire was designed by the principal investigator according to the guidelines issued by the Ministry of Health and the other experts of the subject. Questionnaire was designed to be simple, precise and clear containing separate questions on knowledge and preparedness. Questions were arranged in a way to maintain the best possible flow. Most of the questions in the questionnaire were close ended. A few were open ended where the anticipated variability of responses was high.

Language of the instrument: The study instrument was originally constructed in English language. It was then translated to Sinhala by the principal investigator and re

worded to suit the local audience. It was given to an independent translator to assess whether the translation remained similar with the original version. The questionnaire was only translated in to Sinhala language as there were no other languages speaking PHMs in the area. The Sinhala translation was used for the data collection.

Study variables in the questionnaire: The following variables were assessed in the questionnaire that was organized in 3 parts.

Personal information

Knowledge on infant feeding during disasters

Attitudes on infant feeding during disasters

Pretesting of the questionnaire: Pre testing of the study instrument was done by the principal investigator among 10 PHMs in Agalawatta MOH area. It was located in the Kalutara district, belongs to Kalutara RDHS area, which shares much closer socio-demographic and geographic characteristics in study proper areas. A different area was selected to prevent the “rippling effect” among the study population due to their prior knowledge about the study [13].

Following the pre-testing, some wording, structure and the sequence of questions were changed to make it more understandable and to maintain the flow in the questionnaire.

Method of data collection: Data collection was carried out by the principal investigator and questionnaires were given to every PHM in three MOH areas at the monthly conference of each MOH area with prior permission from the 3 MOHs. After selecting the PHMs fulfilling the eligibility criteria, the information sheet and consent form was given. Once they agreed to participate in the study, the questionnaire was given to all PHMs and asked them to fill it individually, without looking into any reference or discussions and hand over back to the Principal Investigator. Other Officials who participated for the conference (MOH, AMOHs, SPHI, SPHM, PHNS, PHI... etc) and PHMs excluded from the study were asked to be stayed away from the vicinity of the participants considering it might affect the responses.

Data entry and analysis: Statistical Package for Social Sciences (SPSS) version 16 software was used to enter the data. Responses were coded and entered in the software. All the data was manually checked and entered by the principal investigator.

Data was statistically analyzed using Statistical Package for Social Sciences version 16 software. Descriptive statistics included quantitative data described in median and inter-quartile range and qualitative data in proportions and frequencies. Chi Square test was used to assess the statistical significance of observed associations and p value of 0.05 was considered as the limit for statistical significance.

Administrative requirements: Informed and written permission to conduct the research in 3 MOH areas was obtained from the Regional Director of Health Services, Kalutara. Permission to participate in the monthly conference was obtained by the 3 MOOH.

Ethical issues and clearance: Ethical clearance was obtained from the ethical review committee of National Institute of Health Sciences. Informed written consent was obtained from the participants prior to the data collection after explaining

verbally and providing an information sheet on all the details of the study. Participants were given adequate opportunities to ask questions. Participants were allowed to refrain from answering any question if they refused and withdraw from the study at any moment.

They were informed that in order to maintain confidentiality their name will not be included in the questionnaire and reference will be made by the index no, data set will be kept under lock and key and restricted access to the database with password protection will be used. They were informed that the information collected will only be used for research purpose and informed consent will be obtained if data is used for some other purposes, the data and ascertainment of outcome of this research will be presented and published as group data locally or internationally and not as individual data. Research team ensured the minimum disturbance to their work while distributing and collecting the questionnaire.

The study findings were planned to be communicated to the relevant authorities to conduct training programs for this population to improve their knowledge and preparedness in maternal and child care in disasters.

## 6. Results

At the time of the data collection there were 80 PHMs who were eligible for the study. 2 of them were not participated and the final number of study participants was 78 giving a response rate of 97.5%.

Characteristics of the study population

Demographic and socio-economic characteristics

The following table shows the age distribution of the study participants.

*Table 1. Age distribution of the study participants.*

Age category (years)	No	%
21 – 30	24	32.1
31 – 40	16	19.2
41 – 50	21	25.6
51 – 60	17	23.1
Total	78	100.0

Among the PHM in 3 MOH areas (n=78), 51.3% (n=40) were ≤ 40 years of age while 38.7% (n=38) were aged > 40 years. Age was normally distributed with a median of 38 years (Inter quartile range: 25% - 29, 50%- 38, 75% - 50 years).

The following table shows the other demographic and socio-economic characteristics of the study sample.

*Table 2. Other Socio demographic characteristics of the study participants.*

Socio demographic characteristic	No	%
Race		
Sinhala	78	100
Religion		
Buddhist	78	100
Marital status		
Married	64	83.3
Unmarried	11	12.8
Widowed	3	3.8
Total	78	100.0

All the study participants (100%, n=78) were Sinhalese and Buddhists. Among them, 83.3% (n=65) were married.

#### Occupational training and field experience

The following table shows the occupational profile of the study participants.

**Table 3.** Occupational profile of the study sample.

Occupational profile	No	%
Year of enrollment		
1981 - 1990	5	5.1
1991 - 2000	30	39.7
2001 - 2010	15	17.9
2011 - 2018	28	37.2
Field PHM experience		
< 10 years	21	25.6
10 – 19years	32	42.3
20 – 29 years	24	29.5
30 –39 years	1	2.6
Total	78	100.0

Majority (39.7%, n=30) of the study participants were enrolled into the nursing field between 1991 to 2000 and 32.1% (n=25) participants were having more than 20 years of field PHM experience with a median of 11 years.

#### Current PHM field details

Following table shows the details of the current PHM field of the study participants.

**Table 4.** Description of current PHM field of the study participants.

Details of the PHM field		
MOH area		
Bulathsinhala	26	33.7
Palindanuwara	27	33.3
Madurawala	25	33
Total	78	100.0

Among the study participants 33.7% (n=26) were from Bulathsinhala MOH area while 33% (n=25) were from Madurawala MOH area.

#### Assessment of knowledge on infant feeding in disasters.

Firstly, the knowledge was assessed by analysing the responses given by study participants for individual questions. The expected answer was stated initially and then the proportion of responders who gave the correct answer and incorrect answer were calculated. Those who have not answered were categorised into NA (Not answered) group. This helped to find out in which section the study population was lacking in knowledge. Secondly, the final total was taken to get an idea about the overall knowledge of the

population, which was used to compare with the associated factors.

#### Individual knowledge responses of the study participants

The following table shows the knowledge on antenatal care of the study participants.

The study participants have a good knowledge on complementary feeding with the average of 91.7% correct answers on infant feeding, while their knowledge in breast feeding is lacking, having an average of 70.24%. Also, they were unable to answer correctly for the case scenario given, giving an average response rate of 60.7%.

91% have identified the disaster-prone areas in their relevant PHM fields and 92.3% have identified a safer place to locate them. Majority (n=53, 67.9%) were not learnt about disaster management and 15.4% (n=12) have learnt about it in their basic training.

#### Overall knowledge of the study participants

The overall knowledge of the study participants were assessed by calculating the final total for the knowledge section of the questionnaire in each study participant. For the 12 questions in the knowledge component, the correct answers were given 1 mark. No marks were given for wrong answers and not answered questions. According to the distribution the mean, median and mode was around 09 out of 12. (Inter quartile range: 25% - 8, 50% - 9, 75% - 10). Standard deviation was 1.8. The categorisation of knowledge was done according to the standard deviation. Those who obtained total marks less than 9 was considered as having poor knowledge and more than 9 was considered as good knowledge.

The below table shows the overall knowledge according to the categories, of the study population.

**Table 5.** Overall knowledge categories of the study population.

Knowledge category	No	%
Poor (0 – 8)	26	33.3
Good (9 – 12)	52	66.7
Total	78	100.0

In the study population 66.7% (n=52) were having a good knowledge on infant nutrition during disasters while 33.3% (n=26) had a poor knowledge.

Association of knowledge with other factors of the population

The following table describes two separate associations.

**Table 6.** Association of knowledge with other factors of the population.

Characteristic		Knowledge			Significance
		Poor No (%)	Good No (%)	Total No	
Age (years)	< 40	14 (35.0%)	26 (65.0%)	40	X <sup>2</sup> =0.1 df=1 p=0.7
	>40	12 (31.6%)	26 (68.4%)	38	
Field years (years)	< 20	18 (33.3%)	36 (66.7%)	54	X <sup>2</sup> =0.0 df=1 p=1.0
	>20	08 (33.3%)	16 (66.7%)	24	

Characteristic		Knowledge			Significance
		Poor	Good	Total	
		No (%)	No (%)	No	
MOH Area	Bulathsinhala	8 (29%)			X <sup>2</sup> =1.7 df=2 p=0.2
	Palindanuwara	9 (35%)			
	Madurawala	10 (36%)			
Total		26 (33.3%)	52 (66.7%)	78	

According to the table, age, field years of experience and MOH area were not significantly associated with the knowledge on infant feeding in disasters ( $p>0.05$ ).

#### Assessment of the attitude of the study population

Attitude of the study participants was also assessed individually and totally to identify in which areas the study population need more preparedness and to find out the associated factors respectively.

#### Individual preparedness level of study participants

Individual preparedness levels of the participants were assessed by finding the response of each study participant separately.

The following table shows the individual level of preparedness of study participants.

Among the participants 92.3% ( $n=72$ ) were agreed to continue breast feeding in disasters while 60.3% ( $n=47$ ) were believe that the stress prevents breast milk production and 15.4% ( $n=12$ ) that tension passes through breast milk.

85.9% ( $n=67$ ) were believed that artificial feeding need to be minimised in camps and 88.5% ( $n=69$ ) were believe it as an invitation to infections.

Majority 92.3% ( $n=72$ ) we agree that PHM has a role in disasters. 83.3% ( $n=65$ ) were believe that they need an extra

support for breast feeding in disasters.

#### Overall attitude of study participants for disasters

To assess the overall attitude of study participants, the correct answers in attitude section were given a mark. Final total for the attitude section was 8 and according to the distribution the mean, median and mode was around 7. Those who obtained less than 7 was categorised as having a poor attitude and above 7 as having good attitude.

The below table shows the attitude categories of the study population.

Table 7. Overall attitude categories of the study population.

Attitude category	No	%
Poor (0 – 6)	31	39.7
Good (7 – 8)	47	60.3
Total	78	100.0

In the study population 60.3% ( $n=47$ ) were having a good attitude on infant feeding during disasters while 39.7% ( $n=31$ ) were not having a good attitude.

#### Association of attitude with other factors of the population.

The following table describes two separate associations.

Table 8. Association of attitude with other factors of the population.

Characteristic		Preparedness			Significance
		Poor	Good	Total	
		No (%)	No (%)	No	
Age (years)	< 40	17 (42.5%)	23 (57.5%)	40	X <sup>2</sup> =0.3 df=1 p=0.6
	> 40	14 (36.8%)	24 (63.2%)	38	
Field years (years)	< 20	25 (46.3%)	29 (53.7%)	54	X <sup>2</sup> =3.1 df=1 p=0.1
	> 20	06 (25.0%)	18 (75.0%)	24	
MOH Area	Bulathsinhala	10 (33%%)			X <sup>2</sup> =0.6 df=2 p=0.4
	Palindanuwara	11 (34%%)			
	Madurawala	10 (33%)			
Total		31 (39.7%)	47 (60.3%)	78	

Above table shows that there was no significant association with the age, field PHM experience or MOH area with the attitude on infant feeding during disasters ( $p>0.05$ ).

## 7. Discussion

The research was carried out in a direction to know whether the public health midwives had a satisfactory level of knowledge and attitude regarding infant feeding in disasters. Ensuring adequate nutrition for children is a key factor in a disaster. To our knowledge, this study represents the first attempt to undertake systemic collection of data on providing infant nutrition during disasters and evaluate whether the grass

root health care workers have good knowledge and attitude regarding it.

Assessment of the knowledge and attitude of the public health midwives regarding infant nutrition during disasters, related to their socio economic and demographic characteristics, according to their field training is important to find a good method of implementation and future provision of training.

#### Profile of the participants and their PHM experience

The study results revealed that majority (51.3%,  $n=40$ ) of PHM in 3 areas were above 40 years and near retirement. The younger generation was less in the population who is much capable of actively participating in a disaster situation. All

were Sinhalese Buddhists and 83.3% (n=65) were married.

Majority (39.7%, n=31) of the study participants were enrolled into the nursing field between 1991 to 2000 and 32.1% (n=25) participants were having more than 20 years of field PHM experience with a median of 11 years.

#### Knowledge on infant nutrition during disasters

In the knowledge component it was assessed that whether the participants were able to identify the importance of breast feeding and instances of complementary feeding in a disaster situation and whether they were able to manage it in the camp setting with limited facilities. According to the results 66.7% (n=52) were having a good knowledge.

When assessing the individual knowledge relatively they had a good knowledge (91.7%) on complementary feeding and 93.6% (n=73) were believed that breast feeding need not to be discontinued after complementary feeding and 94.9% (n=74) were aware that strict hygienic practices need to be ensured when preparing, storing and complementary feeding.

Individual knowledge on breast feeding is about 70.24% and 85.9% (n=67) were aware that need to give only breast milk to those who were in complementary feeding. 50% were stated that formula feeding need to be introduced for the no mother infants and this concept need to be highly educated for the health care workers that the avoidance of formula in a disaster situation.

When assessing the overall knowledge in the study population, only 66.7% (n=52) were having a good knowledge infant feeding during disasters while 33.3% (n=26) had a poor knowledge.

Only 91% (n=71) of the study population had identified the disaster-prone areas in each PHM field. It is important that everyone should identify the disaster-prone areas in their PHM field and discuss with the people living there about what they should do to mitigate the disaster and how to act if a disaster occurs. Only 92.3% (n=72) had identified a place to locate a camp if a disaster occurs in their PHM field and it is important that they should be aware of a suitable place prior to a disaster.

The study results showed that there was no significant association between the age, field experience, and the MOH area with the knowledge. This revealed that everyone should have a good knowledge in disasters to provide a good infant nutrition practice, in spite of other factors.

#### Attitude of the study population

The attitude on infant feeding was good in 60.3% (n=47) of the study population while others were not having a good attitude.

The level of attitude was also not significantly associated with other factors and it again described that everyone should be prepared for disasters in spite of the age, field PHM experience or MOH area. As we cannot predict when a disaster will occur, everyone should be prepared for disasters. They should have a proper plan of the steps they need to do if a disaster occurs in their field. To be prepared for impending disaster they should have a good attitude about it.

## 8. Strengths and Limitations

### Strengths in the study

This study adopted a cross-sectional descriptive design, which was appropriate for estimating the knowledge and attitudes of the Public Health Midwives in 3 areas and for studying a variety of variables for its associations. Even though it is the simplest form of epidemiological studies, a cross-sectional study provides the first step for analytical studies [14].

The study further minimized selection bias by having appropriate eligibility criteria and recruiting all the PHMs in 3 areas for the study. Pre-planned date and time to commence the data collection were scheduled to increase the validity. By ensuring such a representative sample, reliable results were obtained that could be used by the healthcare providers and administrators to allocate resources and plan effective interventions [14].

### Limitations of the study

Because of the cross-sectional design used in the study, it was difficult to establish the temporal relationship for most of the factors associated with knowledge and attitude of PHM in 3 areas.

The history of disasters and other factors were only subjectively assessed based on self-reported details in the absence of tracing the actual details [15]. The recall bias affected the internal validity [16].

Study was carried out in two selected MOH areas in Sri Lanka. Owing to the narrow variation in socio-cultural and economical status, the findings cannot be generalized to all PHMs in Sri Lanka. It would be ideal if the sample size was increased and expand the study for a larger area to improve the power of the study.

## 9. Conclusions and Recommendations

### Conclusions

Among the PHM in 3 areas majority (66.7%, n=52) were having a good knowledge on infant feeding in disasters. They were able to identify the instances of complementary feeding and importance of exclusive breast-feeding during disasters.

There was no significant association between the knowledge on disasters with age, field experience and MOH area which reflect that, in spite of any situation everyone should have a good knowledge on infant feeding during disasters.

The majority (60.3%, n=47) in the study population were having a good attitude on infant feeding during disasters.

The level of attitude was not significantly associated with age, field experience or MOH area which again reflected that always anybody should have a good attitude on disasters in spite of any circumstances.

### Recommendations

The PHM in 3 areas should be promoted to get further knowledge on disaster as many of them were not learnt about it in any instance in their life time including the basic training. Therefore they should be encouraged to gain more knowledge

and have a good attitude on disasters.

The PHMs should get involved in managing disasters and give them the exposure in camp management and disaster preparedness drills should be carried out regularly for the health staff to get exposed in to disaster situations to improve their knowledge and attitude in disasters.

When conducting knowledge improvement programmes it should mainly focus on improving knowledge on breast feeding and avoidance of formula feeding and complementary feeding. The PHM should train to think of the possible disasters that can happen in their field and be prepared with a written response plan and be aware about the steps to be taken if a disaster occurs in their field.

Knowledge on disaster management should be incorporated in to the basic PHM training and regularly carryout training programmes in MOH, district, regional, provincial and national level.

## References

- [1] WHO. (2015). *WHO | Definitions: emergencies*. [online] Available at: <http://www.who.int/hac/about/definitions/en/> [Accessed 30 Apr. 2015].
- [2] WHO. (2002). *Gender and Health in Disasters*. [online] Available at: [http://www.who.int/gender/other\\_health/en/genderdisasters.pdf](http://www.who.int/gender/other_health/en/genderdisasters.pdf) [Accessed 30 Apr. 2015].
- [3] UNICEF Sri Lanka - Our Focus Areas - Tsunami. [online] Available at: [http://www.unicef.org/srilanka/activities\\_885.htm](http://www.unicef.org/srilanka/activities_885.htm) [Accessed 30 Apr. 2015].
- [4] ReliefWeb, (2014). *Sri Lanka: Floods and Landslides - Jun 2014*. [online] Available at: <http://reliefweb.int/disaster/fl-2014-000070-lka> [Accessed 30 Apr. 2015].
- [5] WHO Violence and disasters (2005). Retrieved from [https://www.who.int/violence\\_injury\\_prevention/publications/violence/violence\\_disasters.pdf](https://www.who.int/violence_injury_prevention/publications/violence/violence_disasters.pdf) on 4<sup>th</sup> February 2022.
- [6] IFRC (2022). Retrieved from <https://www.ifrc.org/what-disaster> on 04 February 2022.
- [7] Ivanov, D., & Dolgui, A. (2021). OR-methods for coping with the ripple effect in supply chains during COVID-19 pandemic: Managerial insights and research implications. *International journal of production economics*, 232, 107921. <https://doi.org/10.1016/j.ijpe.2020.107921>.
- [8] WHO (2004). Guiding principles for feeding infants and young children during emergencies. ISBN 92 4 154606 9. Retrieved from <https://www.who.int/publications/i/item/9241546069> on 2/2/2021.
- [9] WHO (2022). Disasters & emergencies. Retrieved from <https://apps.who.int/disasters/repo/7656.pdf> 4<sup>th</sup> February 2022.
- [10] UNDRR (2022). Retrieved from <https://www.undrr.org/terminology/preparedness> 4<sup>th</sup> February 2022.
- [11] WHO (2001). Infant feeding in emergencies- Module 1. Retrieved from [https://apps.who.int/nutrition/publications/emergencies/ife\\_module1/en/index.html](https://apps.who.int/nutrition/publications/emergencies/ife_module1/en/index.html) on 4<sup>th</sup> February 2022.
- [12] Emergency Nutrition Network (2022). Retrieved from <https://www.enonline.net/ifemodule2> on 4<sup>th</sup> February 2022.
- [13] Callaghan, W. M., Rasmussen, S. A., Jamieson, D. J. *et al.* Health Concerns of Women and Infants in Times of Natural Disasters: Lessons Learned from Hurricane Katrina. *Matern Child Health J* 11, 307-311 (2007). <https://doi.org/10.1007/s10995-007-0177-4>.
- [14] Hennekens, C. H. and Buring, J. E. (1987) *Epidemiology in Medicine*, Little, Brown and Company. Boston/Toronto.
- [15] *IFE Core Group* - IFE Core Group Resources and Outputs [online] Available at: <https://www.enonline.net/ife/iferesourcesoutputs> [Accessed 30 Apr. 2015].
- [16] Tempelaar, D., Rienties, B., & Nguyen, Q. (2020). Subjective data, objective data and the role of bias in predictive modelling: Lessons from a dispositional learning analytics application. *PLoS one*, 15 (6), e0233977. <https://doi.org/10.1371/journal.pone.0233977>.