

## Knowledge of Factors Responsible for and Preventive Measures of Infant Mortality among Childbearing Mothers in Owerri Municipal Council, Imo State, Nigeria

Mgbo Okeke Kalu<sup>1\*</sup>, Stella, C. Eze-Ufodiana<sup>1</sup>, Ngozi Constance Ejimonu<sup>2</sup>, Eunice I. Akunya<sup>1</sup>

<sup>1</sup>Department of Health Education, Alvan Ikoku Federal College of Education, Owerri, Nigeria

<sup>2</sup>Department of Health Sciences and Management, Abia State University, Uturu, Nigeria

\*Corresponding author: Mgbo Okeke Kalu. Department of Health Education, Alvan Ikoku Federal College of Education, Owerri. E-mail: excelkalu01@gmail.com

### Abstract

Infant mortality remains a global public health issue. This study investigated knowledge of factors responsible for and preventive measures of infant mortality among childbearing mothers in Owerri Municipal Council, Imo State, Nigeria. Four research questions and two null hypotheses guided the study. The study adopted a descriptive survey research design. The population for the study consisted of 42,141 childbearing mothers living in Owerri Municipal Council. The sample size was 390 childbearing mothers drawn using two stage sampling procedures. A validated questionnaire titled "Knowledge of Factors Responsible for and Preventive Measures of Infant Mortality Questionnaire (KFRPMIMQ)" was used as instrument for data collection. Descriptive statistics of frequency, percentage, and chi-square were used to answer and analyse the research questions and hypotheses respectively. Results showed that childbearing mothers in Owerri Municipal Council possessed very high knowledge (85.9% and 86.2%) respectively of factors responsible for and preventive measures of infant mortality. Childbearing mothers with primary and tertiary education possessed very high knowledge (87.8% and 86.3%) respectively of factors responsible for infant mortality while those with secondary education possessed high knowledge (67.1%) on the same issue. Childbearing mothers with primary and tertiary education possessed very high knowledge (95.2% and 86.6%) respectively of preventive measures of infant mortality while those with secondary education possessed high knowledge (70.1%) on the same issue. Furthermore, the results revealed that there was significant difference in the knowledge of factors responsible for and preventive measures of infant mortality based on level of education. The authors recommended among others that government and non-governmental organizations should plunge into action in preventing the menace that increases infant mortality in the State.

**Keywords:** knowledge, Infant Mortality, Preventive measures, Factors responsible, Child-bearing mothers

### Introduction

Infant mortality is a global public health issue affecting infants both in the developed and developing countries. It is a major health burden of children under one year of age all over the world. Alijanzadeh, Asefzadeh, and Zaire (2016) reported that Africa is having the highest infant mortality rate with 68 deaths per 1000 live births. Nigeria has the highest number of newborn deaths among countries in Africa, accounting for 255,500 of 912,000 infants who die annually in Africa (Khashu, Narayaman, Bhargava, & Osiovic, 2009). With infant mortality rate of 48 per 1000 live births and over 700 newborn deaths each day, Nigeria ranks seven among the ten African countries where newborns have the highest risk of

dying (Nwaokoro, Ibe, Iheanachor, Emerole, Nwufor, Ebiriekwe, & Owuliri, 2015). Jyotis and Kamalesh (2019) observed that in developing countries like Pakistan about 1.8 per cent children do not live to his/her first birth day due to avoidable environmental threats resulting in a large number of avoidable childhood deaths every year.

Infant mortality refers to the deaths of young children under the age of one. Infant mortality according to UNICEF (2015) is defined as the death of an infant before his or her first birthday. It is a useful indicator on a nation's health because it is often associated with other health factors such as maternal health, quality and accessibility of medical care and socio-economic condition. Adedeji (2015) submitted that infant mortality is the number of deaths in children under the age of one year per one thousand (1000) live births in the same year. This death toll is measured by the infant mortality rate (IMR) which is the probability of deaths of children under one year of age per 1000 live births. The infant mortality rate is used internationally as the indicator that best shows the stage of economic and social development of a country or region, especially because it has a direct relationship with socio-economic variables, and therefore is sensitive to their variation (Mohaimmad, 2019). Bhutta et al. (2011); Asari-Moghaddam et al. (2014) opined that infant mortality rate is commonly included as a part of the standard of living evaluation in economy. Infant mortality is conceptualized in this study as the death of children under one year of age in Owerri Municipal Council.

Infant mortality has been classified into three namely: perinatal, neo-natal and post-natal mortality. Perinatal mortality refers to deaths of children within the first week of birth (Nwaokoro et al., 2015). It is at an unacceptably high level in developing countries especially in sub-Sahara Africa countries (Mattews & MacDorman, 2010). Studies indicates that perinatal mortality rate in developed regions of the world is about 10 per 1000 live births as against 50 per 1000 live births in less developed regions of the world. Nwaokoro et al. (2015) pointed out that these figures are troubling because perinatal mortality rate is a key health status indicator of a community. It is specifically an important indicator of the quality of obstetric and pediatrics care available in any setting and also a major contributor to overall childhood mortality.

Neonatal mortality refers to death of a child within one month of birth. Nwaokoro et al. (2015) described neonatal mortality as death of newborns occurring within 28 days postpartum. It is often attributed to inadequate access to basic medical care during pregnancy and after delivery (Mattews & MacDorman, 2010). Neonatal mortality accounts for about 40-60 per cent of infant deaths in delivery countries. Post-neonatal death on the other hand refers to death of babies between 29 to one year of life. The major contributors are malnutrition, infectious diseases,, smoking and drinking alcohol during pregnancy, sudden infant syndrome and problems with the home environment. Many factors have been adduced to be responsible for infant mortality. These factors include: social factors, environmental factors and behavioural factors of the mother especially during pregnancy. The social factors responsible for infant mortality include poverty nature of care of infants, breast feeding, birth order, birth intervals, place of delivery, maternal age, maternal education and postnatal care. The environmental factors include: poor residential conditions, nature of water supply, lack of safe water supply, poor housing conditions, particulate matter air pollution, poor sanitation heavy mental poisoning, overcrowding and insect breeding. Behavioural factors of the pregnant woman include: cigarette smoking, alcohol drinking, sedentary lifestyle, weight gain, poor utilization of prenatal care facilities and lack of exercise (Adedeji, 2015; Mohaimmad, 2019). Other factors include birth weight malnutrition, previous birth complications, infection, and previous caesarean section, failure to receive tetanus toxoid vaccine, congenital malformation, preterm birth, failure to have a wellness baby check, jaundice among others. Drinking any amount of alcohol during pregnancy may lead to foetal

alcoholic spectrum disorders or alcohol related birth defects. Also tobacco intake during pregnancy has been shown to significantly increase risk of preterm or low weight birth, both of which are leading causes of infant mortality. Demographic variable such as maternal education, is also associated with infant mortality. Mohaimmad (2019) pointed out that maternal education is a key determinant of their children's health. Women with schooling tend to marry late, delay child bearing and are more likely to practice family planning. The author further submitted that illiteracy is the greatest barrier to any improvement in health conditions. This agrees with the Yiqiong, Emily, and Aubrey (2014) explanation that women with lower educational attainment are more likely to smoke during pregnancy, thereby risking their lives and that of their children. The aforementioned factors responsible for infant mortality can be reduced through the adoption of adequate preventive measures.

Preventive measures are interventions directed to avert the emergence of specific conditions, thereby reducing their incidence and prevalence in a given population. Salama (2017) defined preventive measures as actions aimed at stopping a situation from occurring. These measures can be achieved through modification or removal of risk factors for health condition. In the context of this study, preventive measure refers to measures or step taken to prevent the occurrence of infant mortality among infants in Owerri Municipal Council, Imo State. The aim is to reduce risk factors capable of predisposing infants to infant mortality and to enhance protective factors. These can be achieved through lifestyle modification and improvements in basic health care and medical advances. Early detection and adoption of appropriate intervention strategies of some health problems can help to save infants from dying.

The preventive measures of infant mortality include improvement on hygiene and sanitation, promoting behaviour changes such as hand washing with soap, adequate nutrition, access to basic maternal and infant health services, preventing preterm and low birth weight, attending regular prenatal care check-ups, taking supplementation, abstinence from alcohol and tobacco during pregnancy, breastfeeding of infants up to 6 months of life (Andrews, Brouillitte, & Brouillitte, 2008; Mohaimmad, 2019; Nwaokoro et al., 2015). Appropriate nutrition for newborns and infants can help keep them healthy and to avoid health complications during early childhood. The American academy of Pediatrics recommended exclusively breastfeeding of infants for the first 6 months of life, following by a combination of breastfeeding and other sources of food throughout the next 6 months of life, up to one years of age. Also attending regular prenatal care check-ups will help improve the baby's chances of being delivered in a safer condition and surviving. Abstinence from alcohol and tobacco can also decrease the chances of harm to the foetus during pregnancy. Knowledge of the above mentioned preventive measures and their proper implementation will go a long way to help reduce the incidence of this problem among our infants.

Knowledge refers to information and understanding gained through learning or experience. Knowledge according to Sanni, Udoh, Okediji, Modo, and Ezeh (2012) is described as understanding of someone or something such as information, facts or skills which is acquired through expertise or education, by discovering or learning. Knowledge is conceptualized in this study as that amount of information or facts childbearing mothers in Owerri Municipal Council have acquired about the factors responsible for and preventive measures of infant mortality. The process of acquiring knowledge should begin early in people's lives as it is all about a person's level of interest in the subject. Several studies have been conducted on factors associated with infant mortality in different parts of the world especially in Sub-saharan Africa with Nigeria inclusive. But none to the best knowledge of the researchers has been carried out on factors responsible for and preventive measures of infant mortality among childbearing mothers in Imo State. Thus, the researchers were

motivated to ascertain the knowledge of factors responsible for and preventive measures of infant mortality among childbearing mothers in Owerri Municipal Council, Imo State.

### **Purpose of the Study**

The purpose of the study was to assess knowledge of factors responsible for and preventive measures of infant mortality among childbearing mothers in Owerri Municipal Council, Imo State, Nigeria. Specifically, the study determined the:

1. knowledge of factors responsible for infant mortality among childbearing mothers in Imo State;
2. knowledge of preventive measures of infant mortality among childbearing mothers in Imo State;
3. knowledge of factors responsible for infant mortality among childbearing mothers in Imo State based on level of education; and
4. knowledge of preventive measures of infant mortality among childbearing mothers in Imo State based on level of education?

### **Research Questions**

Four research questions were formulated to guide the study:

1. What is the knowledge of factors responsible for infant mortality among childbearing mothers in Imo State?
2. What is the knowledge of preventive measures of infant mortality among childbearing mothers in Imo State?
3. What is the knowledge of factors responsible for infant mortality among childbearing mothers in Imo State based on level of education?
4. What is the knowledge of preventive measures of infant mortality among childbearing mothers in Imo State based on level of education?

### **Hypotheses**

Two null hypotheses were postulated to guide the study:

1. There is no significant difference in the knowledge of factors responsible for infant mortality among childbearing mothers in Owerri Municipal Council based on level of education.
2. There is no significant difference in the knowledge of preventive measures of infant mortality among childbearing mothers in Owerri Municipal Council based on level of education.

## **Methods**

**Research design:** The study adopted the descriptive survey research design. Descriptive research design aims at collecting data on and describing it in a systematic manner the characteristics, features or facts about a given population. It permits the investigation of the current status of the phenomena from a population in their natural setting.

**Area of the Study:** The study was conducted in Owerri Municipal Council. Owerri Municipal Council is one of the local government areas in Imo State and was created in 1996. Owerri Municipal Council is made up of five (5) communities known as Owerri Nchise: Umuoronjo, Amawom, Unwonyeche, Umuodu, and Umuenyima with a land mass of 2,488 square kilometers. Studies indicated that Nigeria with Imo State inclusive ranks seventh among the ten African countries where newborns have the highest risk of dying (Nwaokoro et al, 2015). Thus the researchers deemed the area appropriate for the study.

**Population for the Study:** The population for the study consisted of mothers 15-49 years living in Owerri Municipal Council who have nursed a baby in her life. The projected population of mothers 15-49 years in Owerri Municipal Council is 42,141 in the 5 communities that make up the council (Owerri Municipal Council, 22 per cent up rate record, 2019).

**Sample and Sampling Techniques:** The sample for the study consisted of 390 mothers living in Owerri Municipal Council. The sample was selected by the aid of Cohen, Manion, and Morrison (2011) standardized table for sample size, confidence levels and confidence intervals for random samples. Two stage sampling procedure was employed to draw the sample for the study. In the first stage, 3 out of the 5 communities were drawn using simple random sampling techniques of balloting without replacement. In the second stage, convenience sampling technique was used to select 130 mothers who were in position to give accurate information needed in the study from each of the 3 selected communities. This gave a total of 390 childbearing mothers selected for the study.

**Instrument for Data Collection:** Researcher's designed Knowledge of Factors Responsible for and Preventive Measures of Infant Mortality Questionnaire (KFRPMIMQ) was used for data collection. The KFRPMIMQ consisted of three sections A, B & C. Section A consisted of one item on the respondent's demographic variable of level of education. Section B consisted of eight items on factors responsible for infant mortality while section C contained six items on preventive measures of infant mortality. Three experts, all from the Department of Health Education, Alvan Ikoku Federal College of Education Owerri validated the instrument. The experts' suggestions and inputs were used in producing the final draft of the questionnaire. Test re-test method using Spearman Brown Correlation Coefficient formula was used to analyze the data generated. A reliability index of .065 was obtained and adjudged reliable for the study.

**Method of Data Collection:** Copies of the questionnaire were administered to 390 childbearing mothers, out of which 333 were returned and used for the study.

**Method of Data Analysis:** Data generated were analyzed using frequency counts, percentages and chi-square statistics. The research questions were answered using percentages while the null hypotheses were tested using chi-square ( $\chi^2$ ) at .05 level of significance. In determining knowledge, Okafor (1997) criterion was adopted. By this a score below 20 percent was interpreted very low knowledge (VLK), a score 21 -39 per cent was interpreted low knowledge (LK), a score 40 – 59 percent was interpreted average knowledge (AK), a score 60 -80 per cent was interpreted high knowledge (HK) and score above 80 per cent was interpreted very high knowledge (VHK).

## Results

**Table 1: Childbearing Mothers Knowledge of Factors Responsible for Infant Mortality (n = 333)**

S/n	Items on factors responsible for infant mortality	Knowledge Responses	
		Yes F(%)	No F(%)
	<b>The following factors are responsible for infant mortality</b>		
1.	Poor nutrition	304(91.3)	29(8.7)
2.	Illnesses and diseases	287(86.2)	46(13.8)
3.	Smoking/ alcohol consumption during pregnancy	259(77.8)	74(22.2)
4.	Short birth intervals of preceding births	238(71.5)	95(28.5)
5.	Poor environmental sanitation	269(80.8)	64(19.2)
6.	Preterm birth/ premature birth	290(87.1)	43(12.9)
7.	Low birth weight	274(82.3)	59(17.7)
8.	Lack of prenatal care	299(89.8)	34(16.2)
	<b>Overall percentage</b>	<b>278 (85.9)</b>	<b>56(14.1)</b>

### Key for interpretation

Below 20% = Very low knowledge (VLK), 20 -39% = Low knowledge (LK), 40 – 59% = Average knowledge (AK), 60 – 80%, = High knowledge (HK) and 81% and above = Very high knowledge (VHK)

Table 1 shows that overall percentage of CBMs' knowledge of factors responsible for infant mortality was 85.9 per cent. This implies that childbearing mothers in Owerri Municipal Council possessed very high knowledge that poor nutrition, illnesses and diseases, smoking/ alcohol consumption during pregnancy, short birth interval, inadequate parental care, preterm birth, low birth weight, and lack of prenatal care are factors responsible for infant mortality.

**Table 2: Childbearing Mothers Knowledge of Preventive Measures of Infant Mortality (n = 333)**

S/n	Items on Preventive measures infant mortality	Knowledge Responses	
		Yes f(%)	No f (%)
	<b>Infant mortality can be prevented using the following measures</b>		
1.	Regular prenatal care check-ups.	275(82.6)	58(17.4)
2.	Breastfeeding a child up to one year	301(90.4)	32(9.6)
3.	Living in a safe and healthy environment.	290(87.1)	43(12.9)
4.	Periodic immunization	282(84.7)	51(15.3)
5.	Proper treatment of diseases	293(88.0)	40(12.0)
6.	Improved personal hygiene such as hand washing with soap before touching the baby	252(75.7)	81(24.3)
	<b>Overall percentage</b>	<b>282(86.2)</b>	<b>51(13.8)</b>

Table 2 shows that overall percentage of CBMs' knowledge of preventive measures of infant mortality was 86.2 per cent. This implies that childbearing mothers in Owerri Municipal Council possessed very high knowledge that regular prenatal care check-ups, breastfeeding a child up to one year, living in a safe and healthy environment, periodic immunization, proper treatment of diseases, and improved personal hygiene such as hand washing with soap before touching the baby are preventive measures of infant mortality.

**Table 3: Childbearing Mother’s Knowledge of Factors Responsible for Infant Mortality based on Level of Education (n = 333)**

S/n	Items	Knowledge Responses		
		PE ( n = 31) Yes F(%)	SE(n= 54) Yes F(%)	TE(n =248) Yes F (%)
<b>The following factors are responsible for infant mortality</b>				
1.	Poor nutrition	30(96.8)	47(87.0)	277(91.5)
2.	Illnesses and diseases	31(100.0)	33(61.1)	223(89.9)
3.	Smoking/ alcohol consumption during pregnancy	19(61.3)	27(50.0)	213(85.9)
4.	Short birth intervals of preceding births	25(80.6)	30(55.6)	183(73.8)
5.	Poor environmental sanitation	21(67.7)	38(70.4)	210(84.7)
6.	Preterm birth/ premature birth	31(100.0)	40(74.1)	219(88.3)
7.	Low birth weight	30(96.5)	34(63.0)	210(84.7)
8.	Lack of prenatal care	31(100.0)	41(75.9)	227(91.5)
<b>Overall percentage</b>		<b>(87.8)</b>	<b>(67.1)</b>	<b>(86.3)</b>

Table 3 showed that overall percentage affirmed that childbearing mothers with primary and tertiary education possessed very high knowledge (87.8% and 86.3%) respectively of factors responsible for infant mortality while those with secondary education possessed high knowledge (67.1%) on the same issue.

**Table 4: Childbearing Mothers’ Knowledge of Preventive Measures of Infant Mortality based on Level of Education (n = 333)**

S/n	Items on Preventive measures infant mortality	Knowledge Responses		
		PE ( n = 31) Yes F (%)	SE(n= 54) Yes F(%)	TE(n =248) Yes F(%)
<b>Infant mortality can be prevented using the following measures</b>				
1.	Regular prenatal care check-ups.	30(96.8)	36(66.7)	209(84.3)
2.	Breastfeeding a child up to one year	30(96.8)	40(74.1)	231(93.1)
3.	Living in a safe and healthy environment.	30(96.8)	37(68.5)	223(89.9)
4.	Periodic immunization	27(87.1)	37(68.5)	188(75.8)
5.	Proper treatment of diseases	29(93.5)	42(77.8)	222(89.5)
6.	Improved personal hygiene such as hand washing with soap before touching the baby.	31(100.0)	35(64.8)	216(87.1)
<b>Overall percentage</b>		<b>(95.2)</b>	<b>(70.1)</b>	<b>(86.6)</b>

Table 4 shows that overall percentage affirmed that childbearing mothers with primary and tertiary education possessed very high knowledge (95.2% and 86.6%) respectively of the preventive measures of infant mortality while those with secondary education possessed high knowledge (70.1%) on the same issue.

**Table 5: Summary of Chi-square Analysis of No Significant Difference on Knowledge of Factors Responsible for Infant Mortality among Childbearing Mothers in Owerri Municipal Council based on Level of Education (n = 333)**

Variable	N	Knowledge Reponses		x <sup>2</sup>	df	p-value
		Yes O(E)	No O (E)			
Primary Education	31	31(26.6)	0(4.4)			
Secondary Education	54	33(46.4)	21(7.6)	35.2	2	.000
Tartary Education	248	221(212.1)	26(34.9)			

Table 5 shows the chi-square value for the hypothesis of no significant difference in the knowledge of predisposing factors of infant mortality among childbearing mothers based on level of education ( $\chi^2 = 35.2$ ,  $df = 2$ ,  $p = .000 < .05$ ). Since the p-value was less than .05 level of significance at 2 degree of freedom, the hypothesis was therefore rejected. This implies that significant difference existed in the knowledge of factors responsible for infant mortality among childbearing mothers in Owerri Municipal Council based on level of education.

**Table 6: Summary of Chi-square Analysis of No Significant Difference on Knowledge of Preventive Measures of Infant Mortality among Childbearing Mothers in Owerri Municipal Council based on Level of Education (n = 333)**

Variable	N	Knowledge Reponses		x <sup>2</sup>	df	p-value
		Yes O(E)	No O (E)			
Primary Education	31	30(26.7)	1(4.3)			
Secondary Education	54	34(46.5)	20(7.5)	30.37	2	.000
Tartary Education	254	222(212.9)	25(34.1)			

Table 6 shows the chi-square value for the hypothesis of no significant difference in the knowledge of preventive measures of infant mortality among childbearing mothers based on level of education ( $\chi^2 = 30.37$ ,  $df = 2$ ,  $p = .000 < .05$ ). Since the p-value was less than .05 level of significance at 2 degree of freedom, the hypothesis was therefore rejected. This implies that significant difference existed in the knowledge of preventive measures of infant mortality among childbearing mothers in Owerri Municipal Council based on level of education.

### Discussion

The findings of the study in table 1 showed that childbearing mothers in Owerri Municipal Council possessed very high knowledge (85.9%) of factors responsible for infant mortality. The factors include poor nutrition, illnesses and diseases, smoking/ alcohol consumption during pregnancy, short birth intervals, inadequate parental care, preterm birth, premature birth, low birth weight and lack of prenatal care. The findings were expected and therefore not surprising because studies have shown that the aforementioned factors are responsible for infant mortality. The findings were in line with the findings of Sharifzadeh, Namakin, and Mehrjoofard (2008) who reported a high knowledge of factors responsible for



infant mortality among the study participants. The findings agree with the findings of Ayenigbara and Olorunmaye (2012) who reported that poor nutrition, poverty, lack of adequate medical care, too frequent pregnancies etc are factors responsible for infant mortality. The findings agree with the findings of Nwaokoro, Ibe, Ihenachor et al. (2015) who reported that birth spacing, infection, malnutrition, alcohol intake, low birth weight, preterm birth, failure to have a wellness baby check are factors responsible for infant mortality. The findings were also in line with the assertion of Mohaimmad (2019) who reported that birth weight, bad environmental sanitation, shorter interval between two pregnancies and lack of breast feeding are responsible for infant mortality. The high level of knowledge possessed by the mothers may be due to high level of awareness being created on health issues especially through media.

The findings of the study in table 2 showed that childbearing mothers in Owerri Municipal Council possessed very high knowledge (86.2%) of preventive measures of infant mortality. The preventive measures include: regular prenatal check-ups, breastfeeding a child up to one year, living in a safe and healthy environment, periodic immunization, proper treatment of diseases and improved personal hygiene such as hand washing with soap before touching the baby. The findings were expected and therefore not surprising because studies have shown the aforementioned to be preventive measures of infant mortality. The findings were in line with the assertion of Nussbaum (2011) who reported that reducing the chances of babies being born at low birth weight, focusing on preventing preterm and low birth weight deliveries, hand washing with soap and water before touching the baby and proper environmental sanitation are preventive measures of infant mortality. The findings agree with the explanation of Mohaimmad (2019) who reported that working on preventing preterm and low birth weight deliveries, improving air quality and reduction of contraction of illnesses such as pneumonia are preventive measures of infant mortality. The high knowledge may be due to high level of awareness and enlightenment programme on going preventable health condition such as infant mortality.

The findings in table 3 showed that childbearing mothers with primary and tertiary education possessed very high knowledge (87.8% and 86.3%) respectively of factors responsible for infant mortality. The findings in table 5 showed that there was significant difference in the knowledge of factors responsible for infant mortality among childbearing mothers in Owerri Municipal Council, Imo State based on level of education. The findings were expected and therefore not surprising because education is associated with knowledge. The findings were in line with the findings of Nwaokoro, Ibe, Ihenachor et al. (2015) who reported that mother's level of education was significantly associated with infant mortality. The findings agree with the explanation of Mohammad (2019) who reported that maternal education was significantly associated with infant mortality. The findings were in line with the findings of Ezeh, Ogbo, and Odumegwu (2021) who reported that maternal education was significantly associated with infant mortality. The finding were in line with the findings of Amoo and Ajayi (2019) who reported that educational background is a barrier to knowledge acquisition,

The findings in table 4 showed that childbearing mothers with primary and tertiary education possessed very high knowledge (95.2% and 86.6%) respectively of the preventive measures of infant mortality while those with secondary education possessed high knowledge on the same issue. The findings in table 6 showed that there was significant difference in the knowledge of preventive measures of infant mortality among childbearing mothers in Owerri Municipal Council based on level of education. The findings were expected and therefore not surprising because several studies have indicated that educational level of a woman is a strong determinant of her level of exposure to health problems and their preventive measures including infant mortality. The findings were in line with the findings Meseret, Yegnanew,

and Tesfaye (2012) who reported that education is associated with preventive measures of infant mortality. The findings agree with the findings of Yar'zever and Said (2013) who reported that maternal health services was higher among mothers with formal education than those without formal education.

## **Conclusion**

The findings revealed that childbearing mothers in Owerri Municipal Council possessed very high knowledge of factors responsible for infant mortality. Childbearing mothers in Owerri Municipal possessed very high knowledge of preventive measures of infant mortality. Childbearing mothers with primary and tertiary education possessed high knowledge respectively of factors responsible for infant mortality while those with secondary education possessed high knowledge on the same issue. Childbearing mothers with primary and secondary education possessed very high knowledge respectively of preventive measures of infant mortality while those with secondary education possessed high knowledge on the same issue. There were significant difference in the knowledge of factors responsible for and preventive measures of infant mortality among childbearing mothers in Owerri Municipal Council based on level of education.

## **Recommendations**

Based on the findings and conclusions of the study, the following recommendations were made:

In as much as childbearing mothers have high knowledge of factors and preventive measures of infant the incidence is still high:

1. Government and policy makers should mount deliberate public awareness programme and policy on measures to limit the risk factors.
2. Government and non-governmental organizations should plunge into action in preventing the menace that increases infant mortality in the state.
3. Health educators as well as government should organize programmes that would help to sensitize the mothers more on the need to adopt healthy lifestyle practices before and during pregnancy.
4. Health educators as well as health care providers should educate mothers during antenatal and post-natal care on the need to use maternal health care services during and after pregnancy.

## **References**

- Adedeji, G. A. (2015). The effects of socio-behavioural and environmental factors on infant mortality: A review of the literature. *South American Journal of Public Health*, 3(4), 1-8).
- Alijanzadeh, M., Asefzadeh, S., & Zaire, S. A. (2016). Correlation between human development index and infant mortality rate worldwide. *Journal of Biotechnology and Health Science*, 3(1) Doi.org/10.177-95%2Fbhs-35330
- Amoo, T. B., & Ajayi, O.S. (2019). Maternal mortality and factors affecting it among pregnant woman in Abeokuta South, Nigeria. *Clinical Journal of Obstetrics and Gynecology*, 071-078

- Andrews, K. M., Brouillette, D. B., & Brouillette, R. T. (2008). *Mortality infant. Encyclopedia of infant and early childhood development*. Elsevier. <https://doi.org/10.1016/B978-01237.0877-9.00084.0>
- Ansari- Moghaddam, A., Sadeghi – Bojd, S., Imani, M., Movahedmia, S., & Pourashidi, A. (2014). A multivariate analysis of factors associated with infant mortality in South-East Iran. *Journal of The Pakistan Medical Association (JPMA)*, 64(10).
- Ayenigbara, G. O., & Olorunmaye, V. B. (2012). Investigating causes of infant mortality in Akoko South-west LGA of Ondo State. *Public Health Research*, 2(6), 180-184.
- Bhutta, Z., Dean, S., Imam, A., & Lassi, Z. (2011). *A systematic review of preconception risks and interventions*. Karachi: The Aga Khan University.
- Cohen, L., Manion, L. & Morrison, K. (2011). *Research methods in education (7<sup>th</sup> ed.)*. New York Routledge Taylor & Francis Group.
- Ezeh, O. K., Ogbo, F. X., Odumegwu, A. O., Oforkansi, G. H., Abada, U. O., Goson, P. C., Ishaya, T., & Agho, K. E. (2021). Under-five mortality and its associated factors in Northern Nigeria. Evidence from 22, 455 singleton live births (2013 -2018). *International Journal of Environmental Research and Public Health* <https://doi.org/10.3390/ijerph/8189899>
- Jyoti, V., & Kamallesh, K. P. (2019). *Risk factors of infant mortality in Bangladesh*. <https://doi.org/10.116j.cegh.2019.07.003>
- Kashu, M., Narayaman, M., Bhargava, S. & Osiovic, H. (2009). Prenatal outcomes associated with preterm birth a 33 to 36 weeks gestation. *A Pop Based Cohort Study*, 123(1), 109-113.
- Mathews, T. J., & MacDoman, M. F. (2010). Infant mortality statistics from 2006 period linked birth/ infant death data set. *Nathivixalstat, Rep*, 58(17); 1-31.
- Meseret, Z., Yegnanew, A., & Tesfaye, A. (2012). *Determinant of infant and child mortality in Ethiopia*. Ethiopia: Hawassa University.
- Mohaimmad, N. A. (2019). Risk factors associated with infant mortality in Punjab, Pakistan. *Texila International Journal of Public Health*, 7(4), 1- 12.
- Nussbaum, M. (2011). *Creating capabilities*. The Belknap Press of Harvard University Press.
- Nwaokoro, J. C., Ibe, S. N. O., Iheanachor, C. A., Emerole, C. O., Nwufor, R.C., Ebiriekwe, S.B.C., & Owuliri, V. A. (2015). Risk factors associated with infant mortality in Owerri Metropolis, Imo State, Southeastern, Nigeria. *Science Journal of Public Health*, 3(5-1), 64-71. Doi.116481, siph.s.2015030501.22
- Salama, R. (2017). *Modern concepts of prevention in community health*. Egypt: Suez canal University Press.

Sanni, F., Udoh, F., Okediji, D., Modo, D., & Ezeh, R. (2012). *The selfish brain: learning from addiction*. Washington D.C: Halzelden Information Education.

Sharifzadeh, G. R., Namakin, K., & Mehrjoofard, H. (2008). An epidemiological study on infant mortality and factors affecting it in rural areas of Brijand, Iran. *Iran Journal of Pediatrics*, 18(4), 335-342.

UNICEF, (2015). Averting maternal death and disability. *Data Compilation*.

Yiqiong, X., Emily, W.H. & Aubrey, S.M. (2014). Academic performance, educational aspiration and birth outcomes among adolescent mothers. A national longitudinal study. *BioMed Central Pregnancy and Childbirth*, 14(3).