Relationship of Maternal Socio-economic Variables with Infant Mortality

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Abstract

The aim of this study was to identify the relationships between the age, educational status, religion, socio-economic status and occupation of mothers, and the death of infants. A sample size of 432 women of child bearing age in Anambra State was selected through random and systematic sampling. The instrument for data collection was a Researcher Designed Structured Interview Schedule on infant mortality. Data was analyzed using frequencies, percentages and Fisher's exact test to statistically analyze the relationships between the variables and infant mortality. Findings showed a significant association between infant mortality and age of the mother at the time of birth of the infant (P<0.05), religion (P<0.05), occupation (P<0.05) and education (P<0.001). The study concluded that maternal factors like age, education, religion and occupation were related to infant mortality. Education of the girl child and improving the socio-economic status (SES) of women were recommended to aid reduction in infant mortality.

Keywords: Infant mortality, Maternal variables, Socio-economic status.

1. Introduction

Many of the newborns die during their first year of life, because of certain factors and conditions which are indirect measures of the health of the mother and the child. Infant mortality is a major public health problem in the world, especially in the developing countries, like Nigeria and Anambra State is not an exception. Rao, Chakladar, Nair, Kutty, Acharya, Bhat and Krishnan (2007) contended that infant mortality rate is generally regarded as a reliable and sensitive index of the total health status of a community and often used as an indicator to gauge the level of socio-economic development of a country and partly on other factors associated to the people of that country. Rao, et al. (2007) further stated that in recent years, socio-economic development has been incorporated as one of the parameters to compute physical quality of life index. It is the opinion of Lucas and Gilles (2003) that infant mortality rate is widely accepted as one of the most useful single measures of health status of a community and that it may be very high in communities where health and social services are poorly developed.

The death of these children could result from many factors which may include infant and maternal factors. Infant factors may include birth defects and congenital abnormalities, low birth weight, among others. Maternal factors may include socio-economic factors such as maternal literacy, maternal nutrition, maternal age, tobacco smoking, maternal health, and lack of exposure to mass media, standard of living, customs and beliefs, among others. There may be a significant connection or similarity between these factors and infant mortality.

Observing the world indices, through Factsheet, the United Nations Children's Fund [UNICEF] (2003) noted the decline in infant mortality from 126 in 1960 to 57 in 2001. However, infant mortality rate (IMR) remained higher in less developed countries (LDCs). In Nigeria, according to United Nations/World Factsheet on Wikipedia (2011), the infant mortality rate has remained high (109.5 per 1000 live births).

A study conducted by Hobcraft, McDonald, and Rutstein (1984) suggested that mother's education, occupation, socio-economic status, physical activity during pregnancy, age at marriage among others were found to be significantly associated with infant death. These factors vary from one area to another, depending upon geographic, socio-economic and cultural factors. The rate of infant mortality can be reduced if the maternal risk factors are detected early and managed properly. Using Nigerian data, Caldwell (1979) argued that education of the woman plays an important role in determining child survival even after controlling a number of other factors such as socio-economic characteristics of the husband, including his educational level and occupation.

In Anambra State, Nigeria, the evidence on the association between various maternal socio-economic factors and infant mortality is scarce. Thus, it is necessary to identify factors prevailing in this area responsible for infant mortality. This study contributed infilling this gap in knowledge. Mothers are expected to benefit from this study, as the information from the result when disseminated would expose how mother's age affect infant mortality, which will enable the mothers to know the good age to have their babies in order to reduce infant mortality rate in the state. Therefore, this study was conducted with the following objectives: (i) study the age of mothers as it affects infant mortality in Anambra State. (ii) mother's education as it affects infant mortality in Anambra State. (iii) mother's religion as it affects infant mortality in Anambra State and (iv) mother's occupation as it affects infant mortality in Anambra State.

2. Materials and Methods

The research design used in this study was the descriptive survey design. The study was conducted in Anambra State which is one of the thirty six (36) states of Nigeria. The population of the study involved women of reproductive age who had experienced infant mortality between years 2000 to 2011. These women were interviewed to get information on the socio-economic factors affecting infant mortality. A sample size of 398 was determined using the 'Yaro Yamane' formula (Uzoagulu, 2011). Random sampling technique was used to select the samples of the study. Firstly, the local governments were listed and a systematic random sampling technique was used to select seven LGs out of the existing 21 LGAs in the State. This was determined based on the alphabetical list of the LGAs in the state. Simple random sampling technique was used to draw two communities from each of the seven LGAs, making a total of 14 communities. Thereafter every mother who have experienced infant mortality during the year 2000 –

2011 in the selected communities and who were willing to participate were included in the study and interviewed on a house to house basis. The instrument for collecting data was a structured interview schedule on infant mortality. The mothers were interviewed using this schedule and their responses recorded accordingly. The face and content validity of the structured interview schedule was established. A Split-half reliability method was used to determine the reliability of the instrument which yielded a co-efficient reliability test result value of 0.90 indicating positive reliability of the instrument. A personal interview was carried out with the predesigned interview schedule for collecting data. Privacy and anonymity of the individuals were maintained. Confidentiality was gained from mothers. Institutional Ethics Clearance was obtained from the ethical board of Faculty of Health Sciences and Technology, Nnamdi Azikiwe University Nnewi Campus.

Information regarding the maternal factors like age, education, religion, socio-economic status and occupation were noted. The exercise lasted for sixteen weeks and a total of 432 women were interviewed. Data entries fed into the computer were analysed using Statistical Package for Social Sciences software (SPSS). The results were presented using percentages to answer the research questions and Fishers' Exact test coefficient used to determine the difference between mother's education, age of mothers at the time of the child's birth, occupation, and religion with infant mortality. The null hypothesis was tested at 0.05 level of significance.

3. Results

Research Question 1

How does age of the mothers affect infant mortality in Anambra State?

Table 1: Age groups of mothers at the time of birth of the dead infant and infant mortality

AGE (YEARS)	f	%
10-14	7	1.6
15-20	33	7.6
21-25	72	16.7
26-30	92	21.3
31-35	144	33.3
36-40	65	15.0
41-45	38	8.8
46-50	8	1.8

Multiple Responses permitted

The table showed that mothers age 31-35 had more infant mortality (33.3%) while the other ages indicated a lesser infant mortality percentage.

Hypothesis 1

Ages of the mothers do not have significant effect on infant mortality in Anambra State.

Table 2: Analysis of age group of mothers and infant mortalities

Age of mother (Years)	Infant Mortality N (%)			Total N (%)
	1	2	≥ 3	
10-14	6 (100)	0 (0)	0 (0)	6 (100)
15-20	14 (93.3)	1 (6.7)	0 (0)	15
21-25	33 (97.1)	1 (2.9)	0 (0)	(100)
26-30	55 (91.7)	4 (6.7)	1	34
31-35	81 (81.0)	12	(1.7)	(100)
36-40	68 (73.9)	(12.0)	7	60
41-45	48 (78.7)	21	(7.0)	(100)
46-50	27 (62.8)	(22.8)	3	100
>50	16 (76.2)	11	(3.3)	(100)
		(18.0)	2	92
		13	(3.3)	(100)
		(30.2)	3	61
		4 (19.0)	(7.0)	(100)
			1	43
			(4.8)	(100)
				21
				(100)
Total	348 (80.6)	67 (15.5)	17 (3.9)	432 (100)
Fisher's Exact test	coefficient	= 27.43; P = 0.02		

$P < 0.05$ Significant

Fisher's exact test result in table 2 showed that there was significant effect (P=0.02) of mother's age on infant mortality, hence the hypothesis that age of mother does not have significant effect on infant mortality in Anambra State was rejected.

Research Question 2

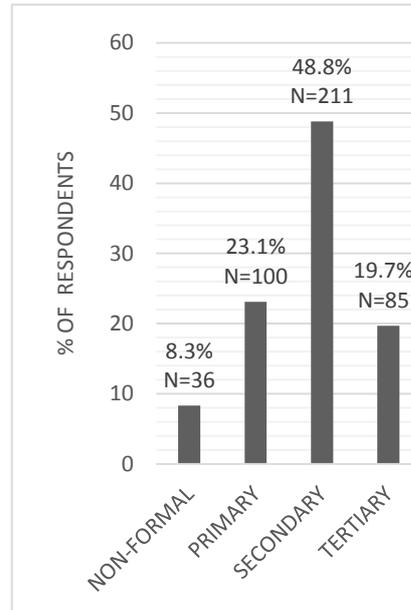How does mother's education affect infant mortality in Anambra State?

Figure 1: Educational status of mother and infant mortality.

The figure above showed that mothers with infant mortality who had secondary education were more (48.8%) while those in the other categories showed lesser percentage of infant mortality. Mother's education does not have significant effect on infant mortality in Anambra State.

Hypothesis 2

Table 3: Analysis of mother's educational status and infant mortality.

Educational Status	Infant Mortality. N (%)			Total N (%)
	1	2	≥ 3	
Non-formal	27 (75.0)	7 (19.4)	2 (5.6)	36 (100)
Primary	75 (75.0)	19 (19.0)	6 (6.0)	100 (100)
Secondary	175 (82.9)	30 (14.2)	6 (2.8)	211 (100)
Tertiary	71 (83.5)	11 (12.9)	3 (3.5)	85 (100)
Total	348 (80.6)	67 (15.5)	17 (3.9)	432 (100)
Fisher's Exact	test coefficient	= 4.99; P = 0.49		

$P > 0.05$ Not Significant

The table showed that Fisher's exact test coefficient value was 4.99 and the P-value is 0.49. The Fishers exact test therefore indicated that no significant effect was observed between mother's educational status and infant mortality. The null hypothesis that mother's educational status does not have significant effect on infant mortality in Anambra State was accepted.
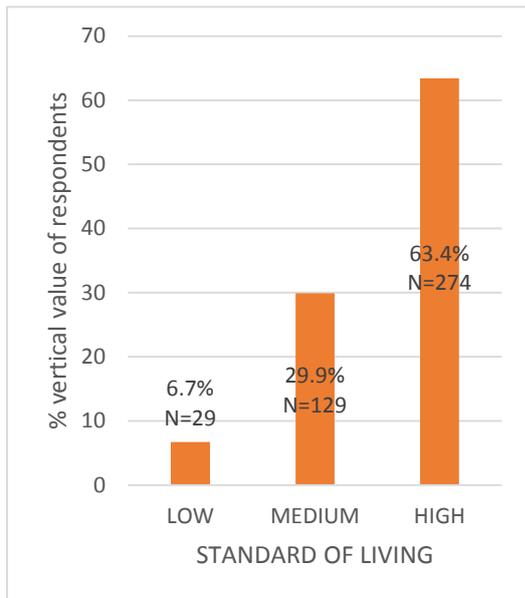

Figure 2: The standard of living (using the standard of living index) and infant mortalities.

Figure 2 indicated that a greater percentage of dead infants belonged to the high standard of living group (63.4%), followed by those who had medium standard of living (29.9%). The data showed that standard of living index affects infant mortality.

Research Question 3

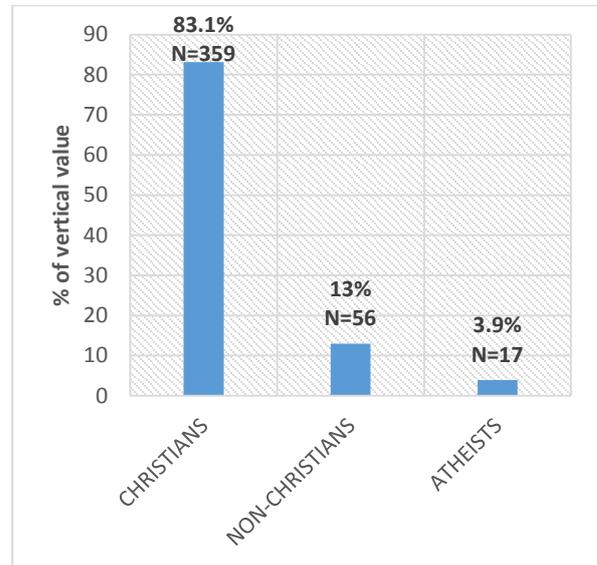How does religion affect infant mortality in Anambra State?

Figure 3: Religion of mother and infant mortality

Figure 3 indicated that mothers who experienced infant mortality, and who were Christians were greater (83.1%) compared to those who were non-Christians (13.0%) and those who were atheists (3.9%). This showed that religion affects infant mortality.

Hypothesis 3

Religion of the mother does not have significant effect on infant mortality in Anambra State.

Table 4: Analysis of mother's religion and infant mortality.

Religion	Infant Mortality. N (%)	
	1	2
Christians	296(82.5)	51 (14.2)
Non-christians	37(66.1)	14 (25.0)
Atheists	15(88.2)	2 (11.8)
Total	348 (80.6)	67 (15.5)

Fisher's Exact test coefficient = 8.80;

P = 0.04   P < 0.05 Significant

In table 4, the summary of Fisher's exact test shows that significant difference P=0.04 was observed between infant mortality and mother's religion. The null hypothesis that mother's religion does not have significant effect on infant mortality in Anambra State was rejected.

Research Question 4

How does mother's occupation affect infant mortality in Anambra State?

Table 5: Occupation of mothers and infant mortality

OCCUPATION	*F*	%
Civil Service	120	27.7
Trading	189	43.8
Farming	60	13.9
Artisanship	55	12.7
Others	8	1.9
TOTAL	432	100

Table 5 indicated that mothers who were civil servants (27.7%) and trading (43.8%) showed a high percentage of infant mortality while mothers in the other categories showed a low percentage of infant mortality, 0- 24 %.

Hypothesis 4

Mother's occupation does not have significant effect on infant mortality in Anambra State.

Table 6: Analysis of mother's occupation and infant mortality.

OCCUPATION	INFANT MORTALITY. N (%)			TOTAL N (%)
	1	2	≥ 3	
Civil Servants	97	21	2	120
Farming	(80.8)	(17.5	(1.7)	(100)
Trading	156	27	6	189
Artisanship	156	27	6	189
Others	(82.5)	(14.3	(3.2)	(100)
	39	14	7	60 (100)
	(65.0)	(23.3	(11.7	55 (100)
	48	5 (9.1)	2	8 (100)
	(87.3)	0 (0)	(3.6)	
	8		0 (0)	
	(100.0			
Total	348	67	17	432
	(80.6)	(15.5)	(3.9)	(100)

Fisher's exact test coefficient = 15.77;

P = 0.03. P < 0.05 Significant

Table 6 shows that Fisher's exact test coefficient is 15.77 and the P < 0.05. The summary of Fishers exact test indicates that a significant effect (P<0.05) was observed between infant mortality and mother's occupation. The null hypothesis that mother's occupation does not have significant effect on infant mortality in Anambra State was rejected.

4. Discussion

4.1 Age and Infant Mortality: Majority of the mothers between ages 31-35 (33.3%) had infant mortality than mothers in the other age groups. The ages of mothers in the study had significant association with infant mortality (P<0.05), therefore the null hypothesis that age of mothers does not have significant association with infant mortality in Anambra State was rejected. These findings were likely to be as a result of the fact that the peak of childbirth is within these ages of 31- 35 years. In recent time, women go to school and get to work bringing about an increase in age of marriage and subsequently first pregnancy. The result is contrary to the findings of Kaldwei (2010); and Forste, (1994), who indicated that increased risk of infant mortality was found in mothers over the age of 35 and that higher risk of infant mortality were indicated for four specific types of pregnancies such as before 18 years, after 35 years, after four deliveries, and birth interval of less than 24 months. The result in this study also contradicted the findings of Huang, Sauve, Birkett, Fergusson, and Van Walrauen (2008), who particularly focused on older ages of childbearing as being influential in child health outcomes and infant mortality. This varied age in the result indicates that the findings concerning mothers' age vary in different regions, which points to the importance of studying mother's age at first birth as it affects infant mortality which was one of the purposes of this study.

4.2 Education and Infant Mortality: Majority of the dead infants' mothers (48.8%) had only secondary education as compared with mothers of other educational status. However, the statistical analysis showed no significant association between mother's educational status and infant mortality (P>0.05). This result could be due to the fact that the women are known to be the ones who take care of the children at all times as well as see to the welfare of the children. The findings of this study could also be due to the fact that many of the mothers were educated, thus education as a comparable variable became insignificant as only 8.3% of the mothers were uneducated. This result is contrary to Adeleye and Ofoegbu's (2013)

assertion that mother's status has been found to influence infant mortality through women's ability to control resources and make decisions. The findings of this study found a similar assertion as Rutstein (2000) posited that mothers with secondary education have 20% less chance of infant mortality compared to mothers who are not educated. Similarly, studies by Mturi and Curtis (1995) in Tanzania and Kembo and Van Ginneken (2009) in Zimbabwe also found a lack of difference in infant mortality in relation to education levels of the mother which is similar to the result in this study. The result is also similar to a study in Nigeria (Adetunji, 1995), which found education to be significant. Conclusively, in this study education was found to have a greater significance on infant mortality rates as mother's level of education will help the mother to be well informed on the care of the child.

4.3 Religion and Infant Mortality: Majority of the mothers (86.3%) who were Christians had infant mortality compared to non-Christians and atheists. Statistically, religion of mothers in this study had statistical significant difference with infant mortality and so the null hypothesis was rejected. These results may have been as a result of the fact that religion involves the personal beliefs or values of people and majority of the respondents were Christians. In the contrary opinion of Agadjanian and Menjivar (2008), mother's religion may decrease the likelihood of infant and child death and can lead to better infant survival. Elifson, Klein, and Sterk, (2003); Powell, Shahabi, and Thoresen, (2003); Chatter, (2000); Ellison and Levin, (1998), posited that religious involvement is beneficial to health of individuals and populations. In this study, religion had a significant association with infant mortality.

4.4 Occupation and Infant Mortality: There was low percentage of mother's occupation (43.8%) on infant mortality. Mother's occupation in this study had significant effect on infant mortality therefore, the null hypotheses were rejected. These results could be because mothers who have good jobs are expected to have good lifestyle. In this study, more of the mothers were civil servants and traders who are expected to have at least enough resources to have a good lifestyle but these groups recorded a higher infant mortality. Also one's occupation is expected to be the reflection of the physical environment, social environment, education background, income and lifestyle and for this reason, occupation is taken as an index of socioeconomic status.

5. Conclusions

Religion had a high percentage (83%) with infant mortality but there was a low percentage of mother's age (< 33%), mothers with secondary education (< 38%), occupation (33%), and infant mortality in Anambra State. Statistically, there were significant differences of age group of the mothers, religion and occupation with infant mortality. There were no statistical differences between mother's education and infant mortality. The findings indicated that ages of the mothers during the time of birth of the infant has a statistical significant effect on infant mortality. This implies the need to create awareness on the importance of early girl child education, improving the socio-economic status (SES) of people and providing better working conditions which will help to reduce infant mortality.

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