Assessment of Knowledge and Compliance with Routine Immunization among Nursing Mothers in Ekiti State

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Abstract

This study was carried out to assess nursing mothers' knowledge and compliance with routine childhood immunization. The descriptive research design of the survey type was adopted in this study. Four hundred and eighty nursing mothers having babies between 9 and 12 months, randomly selected from twelve health facilities in Ekiti State, participated in the study. Data was collected with the use of self-developed, validated questionnaire. Analysis of data was carried out using frequency counts, percentages, mean, ANOVA, and Pearson Product Moment Correlation, and all inferences were made at 0.05 level of significance. The findings revealed that level of knowledge of routine childhood immunization among nursing mothers was moderate while the level of compliance was high. The age of mothers significantly influenced their knowledge. Younger mothers' had better knowledge than older ones. Compliance of mothers with routine childhood immunization was significantly influenced by mothers' educational status and their age. There is the need to intensify public health campaigns on the importance of routine childhood immunization to raise awareness of mothers on routine childhood immunization and sustain the high level of compliance already attained.

Keywords: Childhood, Immunization, knowledge, Compliance, Mothers

Introduction

The public health effects of leaving children unprotected against killer diseases are enormous. Children under the age of five are vulnerable to infectious diseases like measles, pneumonia, tuberculosis, and yellow fever (UNICEF, 2018) that cause child morbidity and mortality. According to WHO (2019), a single child left untreated of polio, puts all children in all countries at risk of contracting polio. Also, pneumonia, diarrhea, malaria and other

childhood diseases have been reported to be responsible for high percentage of global deaths among children under the age of 5years (UNICEF, 2018).

Immunization is one of the most cost-effective public health interventions which offer protection against childhood diseases. Immunization can either be routine or supplemental. Routine immunization is the nationally scheduled regular administration of vaccine dosages to infants at specified ages with the main aim of delivering to all children, a complete scheduled number of doses of potent vaccines in a timely, safe, and effective way to immune them against the targeted diseases(Adefolalu, Kanma-Okafor & Balogun, 2019). Supplemental immunization, on the other hand, takes the form of mass immunization campaign, that it is conducted at a certain period of the year to deliver vaccines to individuals especially children that were missed by routine immunization services (WHO, 2016).

The introduction of immunizations has resulted in a vast reduction in the prevalence of childhood morbidity and mortality worldwide. More than 2.5 million child deaths are prevented globally through vaccines. It is also evident that an additional 2 million child deaths could be prevented each year through immunization with currently available vaccines (WHO, 2020). Also, through vaccinations, the health of children is protected and the cost of medical expenses reduces.

Despite the tremendous impact of immunization in reducing infectious diseases among children, and the enormous efforts of the Government, assisted by UNICEF and WHO, in making available necessary resources for routine and supplemental immunization for children, Nigeria has witnessed a gradual but consistent reduction in immunization coverage. The national data available in the year 1996 and 2003 showed a steady decline in immunization coverage in Nigeria. WHO-UNICEF estimates of immunization coverage in Nigeria between 2008 and 2019 were just a few percentages above average (WHO-UNICEF, 2020). Hence more still needs to be done. Many factors have a direct link with the low level of immunization in Nigeria. These include a low level of knowledge of what childhood immunization entails, low level of acceptability, low level of compliance with childhood immunization, poor financial status, low level of education, little or no access to the media and poor health-seeking behaviors among others.

Knowledge is the understanding of concepts. In the context of routine immunization, knowledge entails having an understanding of the importance of childhood immunization, knowing the

various vaccinations required to be taken by a child at a specific period, and the health implications of defaulting. Compliance entails adhering to a laid down rule or guideline. In the context of childhood immunization, compliance means adhering to the immunization schedule. It is the timely administration of a vaccination according to the immunization schedule (Hadjipanayis, 2019). When mothers who are the direct caregivers of children have a proper understanding of the importance of childhood immunization, it is likely to influence their acceptability of, and compliance with routine childhood immunization schedule positively. Thereby improving the level of immunization and guaranteeing maximum protection of children against vaccine-preventable diseases.

Having established the importance of knowledge and compliance with childhood immunizations on improving the level of immunization and protecting children against vaccine-preventable diseases, it is important to frequently assess these variables among mothers so that if need be, timely intervention can be planned. The objectives of this study were therefore to determine the level of knowledge of mothers' on routine childhood immunization, to assess the level of compliance of mothers with routine childhood immunization, and to determine the influence of demographic variables of age, educational status, geographical location and number of children of mothers' knowledge and compliance with routine childhood immunization. .

Research Questions

The following research questions were raised to guide the study;

1. What is the level of knowledge of mothers on routine childhood immunization for children in Ekiti State?
2. What is the level of compliance of mothers with routine childhood immunization for children in Ekiti State?

Research Hypotheses

The following hypotheses were formulated for the study;

1. There is no significant relationship between mothers' knowledge of routine childhood immunization and compliance with immunization in Ekiti State.
2. There is no significant influence of educational status on mothers' knowledge of routine childhood immunization.
3. There is no significant influence of age on mothers' knowledge of routine childhood immunization.

4. There is no significant influence of educational status on mothers' compliance with routine childhood immunization.
5. There is no significant influence of age on mothers' compliance with routine childhood immunization.

Methodology

Descriptive research design of the survey type was used for the study in order to describe mothers' knowledge and compliance with routine childhood immunization. This design enables the researcher to observe the situations as they occurred in the field without manipulation of the variables. The population of this study consists of all the 92,967 mothers having children between 9 and 12 months in the three hundred and eight health centers offering routine immunization in Ekiti State (Ekiti State Ministry of Health, 2019).

The sample for this study consisted of 480 mothers nursing infants selected from twelve health centers in Ekiti State, using multistage sampling procedure. The first stage involved the use of simple random sampling technique to select two (2) local government areas (LGAs) from each of the three (3) senatorial districts in Ekiti State. A total of six LGAs out of the sixteen LGAs were selected. The second stage involved the use of simple random sampling to select two towns from each of the six LGAs selected making a total of 12 towns. Thirdly, simple random sampling technique was used to select one health center each from the twelve towns selected. A total of twelve (12) health centers offering routine immunization in Ekiti State were selected. Finally, purposive sampling technique was used in the selection of 40 nursing mothers who brought children between the age of 9months and 12months to routine immunization clinic in each of the selected health center.

The instrument for data collection was a self-developed questionnaire. The instrument had four (4) sections: Section A was used to obtain information about the demographic characteristics of the infants and their mothers. Section B contains items to assess mother's knowledge on routine immunization for infants while Section C was designed to assess mothers' compliance with routine childhood immunization. The face and content validity of the instrument were ascertained by experts in the departments of Human Kinetics and Health Education, Guidance and counseling and Tests and Measurement of Ekiti State University, Ado Ekiti. The instrument was administered on the respondents with the help of three health workers who served as research assistants. Consent was first

obtained from the head of each health centres and the nursing mothers selected. Also, the research assistants were trained on the focus of the research work and modalities to follow in the administration of the instrument. On the spot method of questionnaire administration was adopted.

The data collected from the study were analyzed using descriptive and inferential statistics. The research questions were answered using frequency counts, percentages, mean score and standard deviation. While inferential statistics of Pearson Product Moment Correlation (PPMC) and ANOVA were used to test the hypotheses at 0.05 level of significance.

Results

Research Question 1: What is the level of knowledge of nursing mothers on immunization for children in Ekiti State?

To determine the level of knowledge of mothers on immunization for children in Ekiti State (low, moderate and high), the mean score (16.10) and standard deviation (3.26) of mothers' responses to knowledge items were used. Low level of knowledge was obtained by first subtracting the standard deviation from the mean (16.10-3.26= 12.84) hence any value between 0.00 and 12.84, was categorized as low level. Moderate level was set at any value between 12.85and 19.35, while the high level was set at a value between the addition of the mean and standard deviation (19.36) and the highest possible score on knowledge (i.e 20.00). The level of mothers' knowledge on routine immunization in Ekiti State is presented in Table 1

Table 1: Level of Mothers' Knowledge on Immunization in Ekiti State

Level of knowledge	Frequency	Percentage (%)
Low (0.00-12.84)	58	12.1
Moderate (12.85-19.35)	319	66.5
High (19.36- 20.00)	103	21.5
Total	480	100

Table 1 shows that majority of the respondents (66.5%) had moderate level of knowledge. This shows that the level of mothers' knowledge on routine childhood immunization in Ekiti State was moderate.

Research Question 2: What is the level of compliance of mothers with immunization for children in Ekiti State?

To determine the level of compliance of mothers with childhood immunization (low, moderate and high), the mean score (33.63) and standard deviation (0.079) of the responses of mothers' to items used to measure compliance were used. Low level of knowledge was obtained by subtracting the standard deviation from the mean (33.63-0.079= 33.55) hence any value between 17and 33.55, was categorized as low level. Moderate level was set at any value between 33.56 and 33.70, while high level was set at a value between the addition of the mean and standard deviation (33.71) and the highest possible score on compliance (i.e.34.00). The level of mothers' compliance with routine immunization in Ekiti State is presented in Table 2.

Table 2: Level of Compliance of Mothers with Immunization in Ekiti State

Level of compliance	Frequency	Percentage (%)
Low (17.00- 33.55)	89	18.5
Moderate (33.56-33.70)	-	-
High (33.71- 34.00)	391	81.5
Total	**480**	**100**

Table 2 shows that 89 respondents representing 18.5% of the total sample had low level of compliance while those with high level were 391 representing 81.5%. This shows that the level of compliance of mothers with routine immunization for infants in Ekiti State was high.

Hypothesis 1: There is no significant relationship between mothers' knowledge on routine immunization and their compliance with routine immunization in Ekiti State.

Table 3: Relationship between Mothers' Knowledge and Compliance with Childhood Immunization

Variables	*N*	*Mean*	*SD*	*r*	*p*
Mothers' knowledge on routine immunization	480	16.10	3.260		
Mothers' compliance to routine immunization	480	33.63	0.789	0.385*	.000

Table 3 reveals that the P- value for the relationship between mothers' knowledge and compliance (r value= 0.385) is less than 0.05 which implies that mothers' knowledge had a significant relationship with their compliance with childhood immunization. Therefore, hypothesis 1 is rejected. The result further implies that there is a positive relationship between knowledge and compliance with childhood immunization. This implies that as knowledge increases, the compliance of mothers with routine childhood immunization also increases.

Hypothesis 2: There is no significant influence of educational status on mothers' knowledge of routine childhood immunization

Table 4: Influence of Educational Status on Mothers' Knowledge Routine Immunization

Source	SS	df	MS	F	P
Between Groups	81.929	3	27.310		
Within Groups	5009.662	476	10.525		
Total	5091.592	479		2.595	.052

The result on Table 4 shows that the P-value for the difference in mothers' knowledge based on educational status, is greater than 0.05. Hypothesis 2 is therefore not rejected. This implies that there is no significant influence of educational status on mothers' knowledge of routine childhood immunization.

Hypothesis 3: There is no significant influence of age on mothers' knowledge of routine childhood immunization.

Table 5: Influence of Age on Mothers' Knowledge of Routine Childhood Immunization

Source	SS	df	MS	F	P
Between Groups	116.291	3	38.764		
Within Groups	4975.301	476	10.452	3.709	.012
Total	5091.592	479			

Table 5 shows that the P-value for the difference in mothers' knowledge (F=3.709) based on age is less than 0.05 this implies that age had a significant influence on mothers' knowledge hence hypothesis 3 is rejected. In order to locate the sources of difference among the groups, Scheffe Posthoc test was carried out and presented on Table 6.

Table 6: Scheffe Post-hoc Analysis of Source of Significant Difference in Mothers' Knowledge on Routine Immunization by Age

Age	1	2	3	4	N	Mean
20-29yrs **(1)**				*	171	16.33
30-39yrs **(2)**				*	246	16.00
40-49yrs **(3)**				*	59	16.17
50yrs above **(4)**					4	11.00

Table 6 shows that mothers between the ages of 20 and 29years had the highest mean score of knowledge of routine childhood immunization (16.33), while those who were 50years and above had the least mean score of knowledge.

Hypothesis 4: There is no significant influence of educational status on mothers' compliance with routine childhood immunization.

Table 7: Influence of Educational Status on Mothers' Compliance with Childhood Immunization

Sources	SS	df	MS	F	p
Between Groups	6.121	3	2.040		
Within Groups	291.871	476	0.613	3.327	.020
Total	297.992	479			

Table 7 shows that the P-value obtained for the difference in mothers' compliance based on educational status is less than 0.05. Therefore, hypothesis 4 is rejected; implying that educational status of mothers had significant influence on compliance of mothers' with routine childhood immunization .In order to locate the sources of pair-wise significant difference among the groups, Scheffe Post-hoc test was carried out as depicted on Table 8.

Table 8: Scheffe Post-hoc Analysis of Mothers' Compliance on Routine Immunization Based on Educational Status

Pattern of Employment	1	2	3	4	N	Mean
No formal education **(1)**		*			76	33.45
Primary education (2)					80	33.51
Secondary education (3)					131	33.76
Tertiary **(4)**					193	33.66

Table 8 shows that mothers with secondary education had the highest mean score of compliance with routine immunization (33.76), while those with no formal education had the least mean score of compliance.

Hypothesis 5: There is no significant influence of age on mothers' compliance with routine immunization.

Table 9: Influence of Age on Mothers' Compliance with Routine Childhood Immunization

Source	SS	df	MS	F	P
Between Groups	5.401	3	1.800		
Within Groups	292.591	476	.615	2.929	.033
Total	297.992	479			

Table 9 indicates that the P-value for the difference in mothers' compliance based on age is less than 0.05. This indicate that age had a significant influence on mothers' compliance hence hypothesis 5 is rejected. In order to locate the sources of pair-wise significant difference among the groups, Scheffe Post-hoc test was carried out as presented on Table 10.

Table 10: Scheffe Post-hoc Analysis of Mothers' Compliance with Routine Immunization by Age

Age	1	2	3	4	N	Mean
20-29yrs **(1)**					171	33.61
30-39yrs **(2)**				*	246	33.66
40-49yrs **(3)**				*	59	33.64
50yrs above **(4)**					4	32.50

Table 10 shows that mothers between the age of 30 and 39years had the highest mean score on compliance with routine immunization while those who were 50years and above had the least mean score of compliance.

Discussion

This study was carried out to assess the knowledge and compliance of nursing mothers with routine childhood immunization. Findings of this study revealed a moderate level of knowledge among nursing mothers. This is slightly at variance with the findings of Adefolalu,

Kanma-Okafor & Balogun, 2019) who reported a high level of knowledge among the nursing mothers who constituted their study samples .Knowledge comes through awareness, which in turn can be through education, public enlightenment, campaigns among others. The likely reason for the moderate level of knowledge of routine childhood immunization observed among nursing mothers studied, is moderate level of awareness of what routine childhood immunization entails.

In this study, mothers' knowledge was significantly influenced by their age. Younger mothers were more knowledgeable about routine childhood immunization than the older ones. This is also at variance with the findings of Adefolalu et al (2019) where older mothers were reported to be more knowledgeable than the younger ones. The probable reason why younger mothers displayed better knowledge than the older one in this study is that many young mothers are inexperienced hence they tend to give more attention to everything that may be necessary for the children's health.

Findings of this study, like that of Adefolalu et al (2019), revealed a high level of compliance with routine childhood immunization among nursing mothers. This is highly commendable as this is likely going to reduce the occurrence of diseases among the children. Educational status and age of mothers had significant influence on mothers' compliance. Furthermore, findings of this study shows that mothers with secondary education had the highest level of compliance. This is in contrast with the findings of Konwea, David & Ogunsile (2018), where it was reported that mothers with tertiary education had the highest level of compliance. The finding of this study suggests that having a higher educational status is associated with better compliance with healthy behavior. This is likely because the more educated are likely to have more information about healthy behaviors and are more likely to understand the importance of complying with such behaviors than the less educated (Margolis, 2013).

Conclusion

Based on the findings of this study, it can be concluded that nursing mothers in Ekiti State have moderate knowledge of routine childhood immunization and a high level of compliance with childhood immunization.

Recommendations

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

1. Public enlightenment on the importance of routine childhood immunization should be intensified.
2. Girl child education should be encouraged in the state so as to improve the literacy level of females.
3. The high level of compliance of nursing mothers with routine childhood immunization should be sustained through continued public health campaigns and introduction of incentives to compliant mothers.

References

Adefolalu, O.A., Kanma-Okafor, O.J. & Balogun, M.R. (2019). Maternal knowledge, attitude and compliance regarding immunization of under five children in Primary health care centres in Ikorodu Local Government Area, Lagos State. *Journal of Clinical Sciences.* 16 (1): 7-14.

Hadjipanayis, A. (2019). Compliance with immunization schedule. *Human Vaccine and Immuno therapeutics.* 15(4): 1003-1004.

Konwea, P. E., David, F. A. & Ogunsile, S.E. (2018). Determinants of compliance with child immunization among mothers of children under five years of age in Ekiti State, Nigeria. *Journal of Health Research*.32 (3): 229-236.

Margolis, R (2013). Educational differences in healthy behavior changes and adherence among middle-aged Americans. *Journal of Health and Social Behaviour*. 54(3): 353–368.

UNICEF (2018). Childhood diseases https://www.unicef.org/health/childhood-diseases 21/8/2020

WHO (2016).Planning and implementing high-quality supplementary immunization activities for injectable vaccines: Using an example of measles and rubella vaccines. https://apps.who.int/iris/bitstream/handle/10665/330568/9789241511254-eng.pdf?ua=1. 21/8/2020.

WHO (2019).Poliomyelities.https://www.who.int/news-room/fact-sheets/detail/poliomyelitis 21/8/2020.

WHO (2020). Importance of immunization programmeshttps://vaccine-safety-training.org/Importance-of-immunization-programmes.htm. 21/8/2020l

WHO-UNICEF (2020). Nigeria: WHO and UNICEF estimates of immunization coverage: 2019 revision.https://www.who.int/immunization/monitoring_surveillance/data/nga.pdf 20/8/20