Personal-Level Disposition as Predictors of Infant-Survival Skills among Nursing Mothers in Selected Primary Health Care Facilities in Sokoto State, Nigeria

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Abstract:-

➤ *Background information:*

Infant mortality is a major public health concern worldwide, especially in developing countries. It was reported that 5.2 million children die before the age of 5 years annually, and 47% of these deaths occur in sub-Saharan Africa alone. The Sustainable Development Goals (SDGs), especially Goal 3, aim to reduce under-five mortality to as low as 25 per 1000 live births by 2030. To achieve this goal, interventions that address the underlying factors contributing to infant mortality are necessary. Maternal health, including maternal knowledge, attitudes, and practices, is a crucial factor influencing infant survival, especially in low- and middle-income countries. This study investigated the Personal-level Disposition Factors Influencing survival skills among Nursing Mothers in Selected PHCs in Nigeria.

➤ *Methodology:*

The study design adopted for this research project was a cross-sectional study. Data were collected from 120 respondents who were conveniently selected from two primary health care facilities in Sokoto state with a semi-structured questionnaire (83% reliability). Data were analyzed using appropriate statistical tools.

➤ *Result:*

The results show that all female participants had similar characteristics at a full glance at some areas. The mean age of respondents was 28.32±6.49 years with an age range of 19 to 41 years of age. The Knowledge responses were grouped on a scale and the results showed that most of the respondents had a high level of knowledge regarding infant survival skills. The overall motivation score was moderate. There were significant correlations (at p < 0.05) between knowledge level (R = -0.201), Motivation (R = -0.170), and Behavioural skills.

➤ *Conclusion:*

The report suggested that there should be an aggressive use of peer educators to expand rural health workers in areas with poor adoption of good health interventions, and low immunization coverage in Northwest of Nigeria.

Keywords:- Behavioural Skills, Personal Disposition, Infant Survival, Knowledge, Nigeria.

I. INTRODUCTION

Under-five Mortality Rates (U5MR) remain high in Nigeria. According to the 2013 Nigeria Demographic Health Survey, U5MR of 128 deaths per 1000 live births translates to roughly one in eight children in Nigeria dying before their fifth birthday, which is approximately 21 times the average rate in affluent nations of the world[1].

From 1990 to 2015, Infant Mortality Rates (IMR) in Nigeria decreased by 57% (from 126 to 69 deaths per 1000 live births); U5M decreased by around 49% (from 213 to 109 fatalities) [2]. Several modifiable risk factors and avoidable diseases are typical causes of child mortality. Among such avoidable diseases responsible for fatalities in children are Acute Respiratory Infections (ARIs), diarrhea, malaria, and chronic malnutrition[3.] Deaths in the first 28 days of life have been associated with endogenous (genetically induced malfunctions, premature births) status, quality of antenatal care, whether aid was given during delivery, and postpartum care.

However, mortality in the subsequent eleven months is frequently associated with the socioeconomic position of the household, environmental factors, health behavior, and dietary practices [4]. Other factors have also been connected to infant and toddler mortality. These characteristics include, among others, maternal education, early marriage, place of residence, geographical variations, short birth intervals, fertility behavior, nursing behaviors, use of health services by mother and/or

child, child's gender, ethnicity, and religion[5].

The infant mortality rate, which represents the risk of infant death occurring between birth and the first birthday, is a crucial indicator for assessing a society's overall health and level of development. It reflects the effectiveness of a country's healthcare system and socioeconomic investment in ensuring maternal and child health across different communities and regions worldwide. Globally, 85% of child deaths occur within the first year of life, with more than half of these infant deaths happening in Sub-Saharan Africa (SSA) in 2018, where the Infant Mortality Rate (IMR) was 62 per 1000 live births [6].

The Sustainable Development Goals (SDGs), particularly SDG 3, have prioritized infant survival by aiming to end preventable deaths among children under 5 years of age and reduce under-five mortality to as low as 25 per 1000 live births by 2030 [5] (WHO, 2020). However, due to the slow progress in mortality reduction in sub-Saharan Africa, achieving this target is unlikely for many countries in the region[7].

Nigeria, with a population of nearly 200 million, is one of the five countries accounting for half of the world's infant mortality burden, ranking second only to India. Although

Nigeria has made progress in reducing the IMR from 125 in 1990 to 67 in 2018, the current level is still higher than that of other countries in SSA, such as South Africa (28/1000), Kenya (31/1000), and Ghana (35/1000), which are closer to meeting the SDG objectives [8].

The lack of crucial personal-level dispositions such as knowledge, attitudinal disposition perception, and resources among mothers directly contributes to their inadequate infant survival behavioral skills, which remains a significant concern in achieving Sustainable Development Goal 3.

Despite the global efforts to improve child health and reduce under-five mortality, there is a pressing need to address the deficiencies faced by mothers that hinder optimal infant survival practices. Appraised literature reveals that empowering mothers at the personal level can effectively bridge this gap and equip them with the necessary tools to enhance infant survival [9].

This empowerment encompasses health literacy, including knowledge-driven resources for infant survival, perception-arousing attitudes, and motivation. By focusing on the mothers' specific inadequacies related to their poor infant survival behavioral skills, this study aims to provide them with the essential knowledge and support they lack [10].

Infant survival in Nigeria is threatened by poor healthcare service delivery and malnutrition resulting from widespread poverty. The literature has identified various preventable health and environmental conditions, socio-demographic characteristics, and biological factors associated with mothers

that contribute to the increased risk of infant mortality [11]. It is important to acknowledge that the risk of adverse pregnancy outcomes, including infant mortality, is unequally distributed among women due to their diverse biological and demographic characteristics [12]

Sokoto State, located in northwest Nigeria, has a maternal mortality rate (MMR) three times the national rate, with a low percentage of births occurring in health facilities (National Population Commission, 2014). Northern Nigeria, including Sokoto, has a high prevalence of unassisted births with no skilled attendant present [13].

While some states in Nigeria have seen a reduction in child mortality rates over the years, others continue to report rates that exceed the national goal. For example, Kwara, Enugu, Ebonyi, Cross River, Anambra, Delta, and Lagos have high Under-5 mortality rates (U5MRs), while Sokoto, Gombe, Bauchi, Kebbi, Jigawa, Kano, and Zamfara have the highest U5MRs [14]. Particularly, the North-western states of Nigeria have the highest infant mortality rates. Neonatal, infant, and U5 deaths as expressed in Nigeria Multiple Indicator Cluster Survey (MICS), 2021 was 158 deaths per 1000 in North West, and Sokoto recorded the highest infant mortality with a record of 202 deaths per 1000 live births[15].

II. MATERIALS AND METHODS

A. Study Location

The study was conducted in one of the 36 states that came together to form Nigeria is called Sokoto state. The state of Sokoto may be situated in the most remote section of the northwest of the country, right on the international border with the Republic of Niger, which is located to the state's immediate west. The city of Sokoto is not only the nation's largest metropolis but also acts as the nation's capital. Sokoto State was carved out of what was once known as North Western State on February 3, 1976, during the previous regime led by General Murtala Mohammed. At the time, the region was under the control of General Murtala Mohammed. The confluence of the Sokoto River and the Rima River takes place not far from the city of Sokoto; this geographic feature is the source of the city's name. As of the year 2005, it is believed that there were more than 4.2 million people residing there. As a result of its past role as the capital of the Sokoto Caliphate, the majority of the city's population identifies as Muslim, and the city is widely regarded as an important center for Islamic education within Nigeria.

B. Study Design and Population

The study design adopted for this research project was a cross-sectional study.

C. Sample Size Determination and Sampling Technique

The minimum sample size of 120 was calculated using the sample size determined for this study using the formula when the interest is to test a hypothesis comparing some exposure of two groups:

$$n = (Z\alpha/2 + Z\beta)^2 * (p1 * (1-p1) + p2 * (1-p2)) / (p1 - p2)^2$$

The significance level (alpha): This is typically set at 0.05, which represents a 5% chance of making a type I error (rejecting the null hypothesis when it is actually true).

The power of the study (1-beta): This is typically set at 0.80, which represents an 80% chance of detecting a true effect if one exists. The odds ratio (OR) or relative risk (RR): This is typically set at 2:0 (this represents the strength of the association between the exposure and outcome).

n = sample size
$Z\alpha/2$ = the critical value for the selected alpha level is (1.96, for alpha=0.05)
$Z\beta$ = the critical value for the selected power (0.84 for power=0.80)
P0=Prevalence level at 50% (0.5)
P1 = Desired level of outcome at 80% (0.8).
Plugging in the values, we get:mn = (1.96 + 0.84)^2 * ((0.275 * 0.4) + (0.4 * 0.275)) / (0.275- 0.4)^2 = 117.8

Rounding up to the nearest whole number, we need a sample size of 108. Ten percent of the sample size was added to take care of attrition and compensate for the potential dropout. Therefore, a total of 120 participants, Multi-stage sampling technique was used in the selection of the respondents.

D. Research instrument and data collection methods

A semi-structured questionnaire was used as the study instrument. This was designed to seek information about the respondents' socio-demographic characteristics, Knowledge, Motivation, and Behavioural skills. Research assistants were engaged and trained before data collection.

E. Validation and Pre-Test of the Instrument

The validity and reliability of the questionnaire were donebefore the final collection of data. Two Nigerian experts in the field of Public Health in a Nigerian university evaluated the extent to which the variables in the questionnaires were relevant to the objectives of the study. After that, the questionnaire was pretested among adolescents in selected secondary schools at a different location. This helped to know whether the questionnaire assessed what it intended to measure and whether the language and organization were appropriate to address the objectives of the study. The responses provided also helped to address any form of ambiguity in thequestionnaire as well as modified questions or response categories where necessary. The Cronbach's alpha coefficient of the questionnaire was 0.745, indicating an accept- able internal consistency.

F. Measurement of Outcome Variables

For the questions whose responses were either yes or no, a correct answer was scored 1 and a wrong answer was scored 0. For questions with three responses, (Yes, No and I don't know), the correct response was scored 2, don't know scored 1 while the wrong response scored 0. The mean score of the maximum score for the responses was calculated. The respondents who scored below the mean were regarded as having poor knowledge or negative attitude while those who scored up to or above the mean were regarded as having good knowledge or positive attitude.

G. Data Analysis

Questionnaires were sorted out to check for errors and omissions at the end of the collection of data. After that, data were entered into the computer and analyzed using Statistical Package for Social Sciences (SPSS) version 23.

Frequency distribution tables, charts and graphs were generated from variableswhile cross-tabulation and test statistics were done where applicable. Chi-square was used to compare rates, ratios,and proportions while fishers' exact test was used whencells have expected values less than 5. T test was used to determine the association between the continuous variables. Inferential statistics were done using chi-square to assess and compare the relationships among the categorical variables (Independent) with the overall Dependent variable. All the significant variables during the bivariate analysis were imputed into the logistic model. Adjusted odds ratio (AOR) and 95% confidence interval were also obtained. The level of significance was set at a p-value less than 0.05.

III. RESULTS

The results in Table 1 show that all female participants had similar characteristics at a full glance at some areas. The mean age of respondents was 28.32±6.49 years with an age range of 19 to 41 years of age. According to Figure 1, the majority of the participants fall within the categories of 22 and 30 years of age. This implies that the majority of the respondents are less than 31 years old. The results also indicated that the majority, 49 (98%) of all the participants are married. On educational attainment, non-formal education was 1 (2%), primary education was 11 (22.0%), Secondary education was 32 (64%), and the post-secondary education of respondents was 6(12%).

On ethnicity, 40 (80%) of the respondents were of Hausa origin, while respondents of Fulani Origin were 10 (20%). All respondents identified Islam as their religion. The most common occupation reported was self-employment as indicated by 19 (38%) of the respondents. This is followed by 17 (34%) respondents who are unemployed. The results show that 8 (16%) respondents are housewives and the least group of the respondents are 6 (12%) who are civil servants. Those with more than 2 children comprise 30% of the respondents while those with 2 children are more (40%). However, about 16% of the respondents have lost at least a child to death.

Table 1: Socio-Demographic Characteristics of Respondents

| Variable	Experimental N=25	Control N=25	
	Frequency N%	Frequency N%	p-value
Age (Range: Mode:)	28.32±6.556 (Range:19-41 years old; Mode:22 years old)	27.36±6.480 (Range:18-40 years old; Mode:20 years old	
Marital Status			0.600
Single	3 (12.0%)	3(12.0)	
Married	22(88.0)	21(84.0)	
Educational attainment			0.882
Non-formal	1(4.0)		
Primary	5(20.0)	6(24.0)	
Secondary	16(64.0)	17(68.0)	
Occupation			0.066
Unemployed	8(32.0)	4(16.0)	
Self-Employed	9(36.0)	8(32.0)	
Civil Servant/Private Organization	4(16.0)	1(4.0)	
Housewife	4(16.0)	12(48.0)	
Religion			-
Islam	25(100.0)	25(100.0)	
Ethnicity			1
Hausa	20(80.0)	20(80.0)	
Number of Children Alive			0.992
One child	7(28.0)	6(24.0)	
Two Child	10(40.0)	12(48.0)	
More than two children	8(32.0)	7(28.0)	
Number of Infants You Have Ever Lost			0.988
None	21(84.0)	21(84.0)	
One	3(12.0)	3(12.0)	
More than two	1(4.0)	1(4.0)	
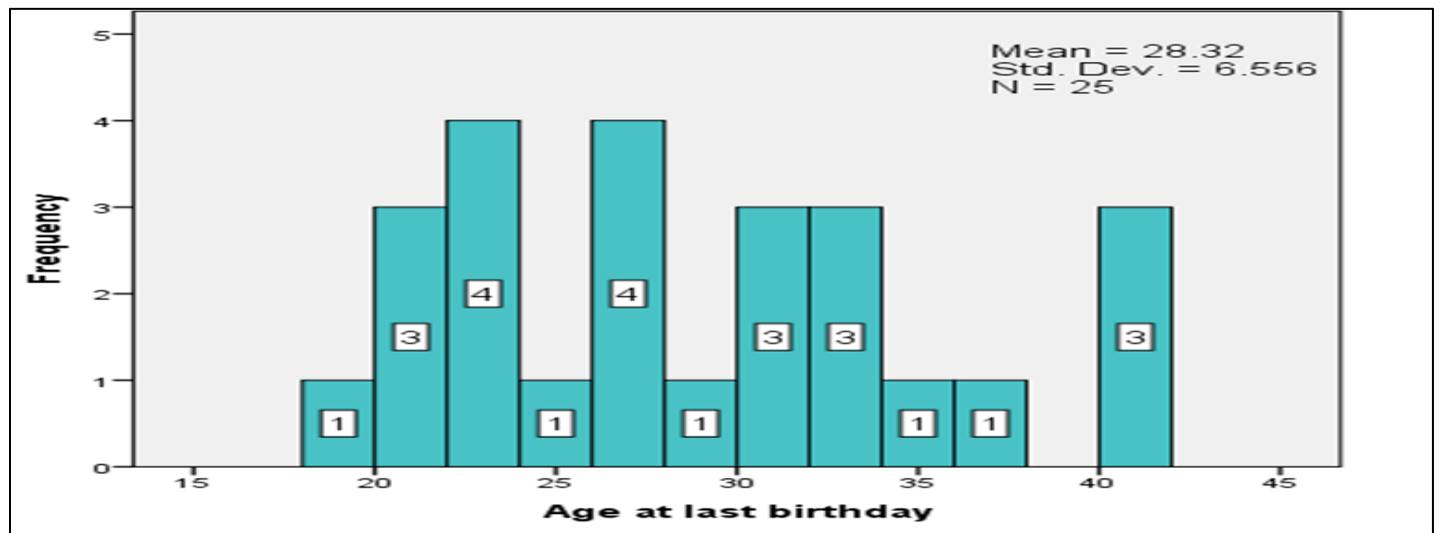
Fig 1: Age Distributions of Participants in the Study

The personal-level disposition of knowledge derived from information for appropriate decision-making, motivation defined by attitudinal disposition and perceptions of mothers revealed that the computed mean and standard deviation scores for knowledge were 13.00 ± 1.08 and 12.52 ± 2.06 (p=0.07) measured on a 15-point rating scale. The motivation score defined by attitudes and perceptions of mothers in this study measured on a 36-point scale, showed a mean score of score of 22.08 ± 3.67 and 17.36 ± 3.4. This indicates that there is a significant difference (p<0.001) between the variables.

At baseline, it can be summarized that both groups have a moderate overall level of motivation.

The behavioural skills scores, which reflect the capacity to practice infant survival with a mean score of 25.48 ± 3.70 measures 39-point scale are reported (see Table 2)

Table 2: Respondents' Level of Knowledge, Motivation and Behavioural Skills

Variables	Maximum Points on Scale of Measure	Respondents in the Group N=120		p-value
		X(SE)	±SD	
Knowledge	15	12.52(0.41)	2.06	0.070
The overall level of motivation	36	22.08(0.75)	3.67	0.000
Behavioural skills	39	25.48(0.75)	3.7	0.605

Table 3: Correlation Analysis Regarding Relationship between Knowledge, Motivation, and Behavioural Skillls

VARIABLES	Behavioural Skills	
	Pearson (r)	p-Value
Knowledge	-0.201	0.070
Motivation	-0.201	0.001

IV. DISCUSSION

This section discusses a study that examined the personal level factors that influences infant survival behavioural skills among Mothers in Selected Primary Healthcare Facilities in Sokoto State, Nigeria.

This discussion clarifies the study's findings and compares them to those of earlier studies based on the research objectives. This study result provides insight into foundational results of a theory-guided peer-education intervention program to influence personal-level disposition and infant-survival practices of Mothers, coupled with motivation defined by attitudes and perceptions of mothers, and on behavioral skills towards Infant-Survival skills in this study.

The level of knowledge of the women on issues related to personal-level disposition and infant-survival practices of Mothers is as high as 82%. However, the motivation towards Implementing Infant Survival Skills was as low as 12% in some cases such as getting encouragement to practice the health counsel, they have received for their infant from those around them.

The infant survival practices in which the behavioral skills are embedded have an average as high as 78%. In all these, there those situations or cases that require intervention and this study research study will go the extra mile to highlight details.

This research study revealed that about 16% of mothers reported having lost at least a child to death in both groups. This is a situation that was not a surprise because in 2018, the neonatal era claimed the lives of 2.5 million newborns worldwide (before age 28 days), and this number is increasing [16].

The national maternal mortality ratio (NMR) in Nigeria was 40 deaths per 1,000 live births; this statistic has only decreased to 36 deaths per 1,000 live births in 2018 and is anticipated to shrink to 35.5 deaths per 1,000 live births in 2020[17].

Neonatal causes accounted for 47% of all fatalities among children under 5 years of age. Sub-Saharan Africa (SSA) has made the least progress in addressing newborn morbidity and death and carries a disproportionately large burden of adverse infant outcomes.

A study verified that women who got an educational intervention had a higher likelihood of starting to breastfeed at a younger age and continuing to do so exclusively. The breastfeeding knowledge and behavioral skills increased, but there was no statistically significant difference between them[18].

According to a study conducted on the Understanding and Practice of Child Survival Techniques among Mothers Attending Postnatal Clinic in Itu, a Sub-Urban Area of South Nigeria, the majority of postnatal clinic attendees possessed adequate knowledge of child survival skills[19]. This result is comparable to that of a stud in a different region in south-south Nigeria and discovered that the majority of women were aware

of the CSS[20]. In contrast, this number is greater than what discovered in western Nigeria. It is probable that the mothers who participated in the survey had a higher level of education than the other mothers because they had a greater comprehension of CSS[21].

V. CONCLUSION

The general objective/aim of the study is to the primary goal of the data analysis in this study is to determine the personal disposition factors that influences infant-Survival behavioural skills among Mothers in Selected Primary Healthcare Facilities, Sokoto State, Nigeria. The theory-guided study revealed that knowledge and motivation can influence mothers behavioural skills.. A similar trend was ensured for the motivational level and behavioural skills .

- **Ethical and Consent to Participate:** Ethical approval for the study was obtained from SokotoState Ministry of Health and permission to carry out thestudy was obtained from the respective head of health facilities where participants were interviewed.

- **Right of decline/withdraw from study:** Respondents were told that participation is voluntary and they would not suffer any consequences if they chose not to participate in the study.

- **Confidentiality of Data:** All information gathered was kept confidential. Participants were identified using serial numbers; the names of respondents were not requested.

- **Consent to Publish:** Not applicable.

- **Availability of Data and Materials:** Data can be made available upon request by external researchers and the corresponding author should be contacted to do so.

- **Funding:** No financial support was received for this research.

- **Author's Contribution:** Authors --------- were involved in the development of the ideafor the study. They were also involved in the data collection, data entry, analysis, and interpretation of the data. They also participated in the manuscript preparation and its critical review. All authors finally read and agreed to the final presentation of the manuscript.

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CONFLICTS OF INTEREST

- The authors declare no conflicts of interest regarding the
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