Knowledge, availability and utilization of growth monitoring facilities in urban and rural health facilities in Enugu State, South East Nigeria: A survey of nursing mothers

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Abstract

Sub Saharan Africa (SSA) has one of the highest rates of child mortality compared to the rest of the world's regions. The usefulness of growth monitoring cuts across all areas of pediatric care and remains the pivot for prevention of childhood diseases and prevention untoward mortality. This study therefore aimed at determining the availability of growth monitoring facilities, and knowledge and utilization of such facilities among mothers attending rural and urban health facilities in Enugu state. This was a cross sectional descriptive survey of mothers done in selected urban and rural government health facilities using the multi-stage sampling method. Data obtained were analyzed using SPSS version 21.0. Conclusions were drawn at a level of significance, p<0.05 at 95% Confidence interval. A total of 440 mothers were recruited for the study; 330 (75%) were from urban and 110 (25%) from rural locations. Mothers in urban centers exhibited higher knowledge (84%, VHL) of growth monitoring facilities than those in rural areas, p=0.04. Growth monitoring facilities were more available in urban areas compared to rural areas, p<0.01. However, growth monitoring facilities were more utilized by mothers in rural areas than in urban locations. Although GM facilities were more available in urban health centers in Enugu state. These facilities were less utilized especially in the urban areas even though mothers demonstrated were very knowledge about these facilities.

Introduction

Sub Saharan Africa (SSA) has the highest rates of child mortality compared to the rest of the world's regions. The index of child mortality in the region has remained persistently poor for decades. Every year, about 2.8 million under-5 deaths occur in SSA. In 2019, the region had an average under-five mortality rate of 76 deaths per 1,000 live births. That is equivalent to 1 child in 13 dying before reaching age 5. This rate is two decades behind the world average, which achieved a 1 in 13 rate by 1999.[1] In Nigeria, under-5 (U5) mortality rate vary widely between regions but remains unacceptably high. Studies in Nigeria have reported varying rates of childhood mortality with sharp differences between rural and urban centers in the country.[2,3] More than 77% of under-5 deaths are due to preventable and treatable childhood infections.[3,4]

Although the major causes of childhood deaths have been attributed to infections, malnutrition remains an important underlying cause or risk factor for infection in children. The usefulness of growth monitoring cuts across all areas of pediatric care and remains the pivot for prevention of malnutrition in children. Poor growth may be the earliest manifestation of malnutrition, chronic infections as well as endocrine and metabolic disorders in children.[5-9] Growth Monitoring (GM) therefore, is an effective, simple, and inexpensive way of preventing most childhood malnutrition and illnesses. Growth monitoring involves regular weighing

and measurement of height and other growth parameters in children and comparing them to standard charts.[11,12]

Effective growth monitoring requires that measurements must be accurately taken using reliable equipment and correct measuring techniques; and subsequently recorded in the growth charts. The technique is simple to perform by mothers irrespective of age and level of education. Thus, it represents a low cost and highly effective way of detecting growth faltering in children and preventing U5 mortality due to malnutrition. Some studies have evaluated the knowledge, and utilization of growth monitoring facilities among mothers.[9,10] These studies have also evaluated the availability of facilities for monitoring growth in health facilities. The availability, knowledge and utilization of these facilities vary widely both within and between countries and tend to be higher in urban compared to rural areas.[6,11-16]

The current study is aimed at determining the availability of growth monitoring facilities, and knowledge and utilization of such facilities among mothers attending rural and urban health facilities in Enugu state, Nigeria. Findings from this study would benefit public health educators, and policy makers in developing targeted public health programs and equitable distribution of resources in the state.

Materials and Methods

Design of the study

This was a descriptive survey done in which facilities and respondents (mothers) who sought health services from facilities in Enugu State were selected using the multi-stage sampling method.

Study site

Enugu State is geographically located in the South-East zone of Nigeria. It has boundaries with Ebonyi State in the East, Anambra State in the West, Benue and Kogi State in the North, Abia and Imo States in the South. Enugu State has seven health districts, *viz*. Enugu, Awgu, Agbani, Isiuzo, Nsukka, Udi and Enugu-Ezike.[17] These health districts were stratified into urban and rural location based on the States health system, hence Enugu and Nsukka were under urban while Awgu, Agbani, Isiuzo, Udi and Enugu-Ezike were under rural locations.

Study population

The respondents for the study were drawn from a population of 133,428 mothers that attended 251 (two hundred and fifty one) health facilities, *viz*. primary health care centers, secondary and tertiary health facilities spread over the seven health districts in Enugu State from January to July 2016.[17]

Sample size calculation and sampling techniques

A sample size of 440 mothers (330 from urban location and 110 from rural location) was used for the study; this was based on the number of women registered at each health center. The sample size was determined using Taro Yamane[18] formula $n = N/1+N(e)^2$; where n = Sample size; N = Total population; and e = Level of significance (0.05).

A multi-stage sampling procedure was adopted to select the needed sample from each of the health districts of Enugu State. Using stratified sampling technique, 40% of health facilities from the sampled health districts were drawn and 40% of the populations was sampled.[19] Seventy four health facilities were selected using balloting with replacement from Enugu, Nsukka, Awgu and Udi health districts were sampled. Proportionate sampling technique was then used to determine the number of respondents that will be selected from the health districts. Finally, convenience sampling technique was used to recruit consenting mothers as they visited health facilities until the required number of respondents were drawn. Women that repeated their visits to the health facilities were recruited only once.

Instrument for data collection

The instrument for data collection was a structured interviewer-administered questionnaire for assessment of knowledge, availability, and utilization of GM as a Child Survival Strategy (CSS). It consisted of four sections from A to D. Section "A" obtained the biodata of the respondents. Section B comprised of twenty-seven items addressing knowledge of growth monitoring as a child survival strategy, Section C had eighteen items on availability of Growth monitoring tools in the health facilities while section D had fourteen items on utilization of facilities and resources for growth monitoring by mothers.

Correct or incorrect response alternatives were assigned to determine their responses to items on knowledge while a four-point response options of 'Very Much Available' (VMA), 'Available' (A), 'Less Available' (LA) and 'Not Available' (NA) were assigned to determine their responses to items on availability; and 'Very Much Utilized' (VMU), 'Utilized' (U), 'Less Utilized' (LU) and 'Not Utilized' (NU) were assigned for items on utilization of growth monitoring facilities. The score was assigned on a Likert Scale; 4 for VMA and VMU respectively, 3 for A and U respectively, 2 for LA and LU respectively, and 1 for NA and NU respectively. The respondents were instructed to tick the options that best matched their opinions on each item.

Validation of the instrument

To ensure the face validity of the instrument, copies of it as well as the research questions for the study were given to five experts, four in the Department of Health and Physical Education and one expert in the department of Science and Computer Education both in Faculty of Education, Enugu State University of Science and Technology, ESUT.

Reliability of the instrument

Copies of the structured questionnaire were administered to 30 CBW who visited five health facilities randomly sampled from Agbani health district. The reliability of items on knowledge was determined using Kuder-Richardson 20 (k-R 20) and a reliability index of 0.93 was obtained. The reliability of items on availability and utilization were determined using Cronbach Alpha formula respectively. Reliability indices of 0.9 and 0.7 were obtained for items on availability and utilization.

Methods of data collection

Seven research assistants who are trained nurses were trained on questionnaire administration. The researcher and the research assistants administered the questionnaire to the women who visited the health facilities and accepted to be part of the study after detailed explanations of the nature of the study were made. Thereafter, the instrument was retrieved for analysis. The duration of the study was six months.

Method of data analysis

Data obtained were screened, sorted, coded, and entered into a personal computer. Further data cleaning was done prior to analysis. Data was analysed with SPSS version 21.0 (IBM, Chicago

Illinois). Responses to question 1 were presented as percentages while responses Level of knowledge of growth monitoring was graded as follows; 1-39% as 'very low level', 40-59% as 'low level', 60-79% as 'high level' and 80-100% as 'very high level'. For availability of growth monitoring facilities, real limit of numbers were used for the scoring: NA 1.00-1.49; LA 1.50-2.49; A 2.50-3.49; and VMA 3.50-4.00. Similarly, real limits of numbers were also used for grading of utilization as follows NU 1.00-1.49; LU 1.50-2.49; U 2.50-3.49; and VMU 3.50-4.00. Conclusions were drawn at a level of significance, p<0.05 at 95% Confidence interval.

Results

A total of 440 mothers were recruited for the study; 330 (75%) were from urban and 110 (25%) from rural locations.

Research question 1

What is the level of knowledge of GM, possessed by mothers in Enugu State? The distribution of correct and incorrect answers is shown in Table 1.

Out of the five questions posed to find out the level of knowledge of GM, mothers in urban centers had very high levels of knowledge on items 1, 2 and 5 (95.2%, 85.5% and 85.5%) and high levels on items 3 and 4 (79.4% and 75.5%) while those in rural centers had very high level of knowledge on only one item (94.5%). Mothers in urban centers exhibited higher knowledge (84%, VHL) of GM than those in rural areas (78%, HL) as shown in Table 1. P-value was 0.04 suggesting that the knowledge of GM possessed by CBW differ based on location.

Research question 2

What is the extent of availability of GM facilities and equipment in Enugu State? Data answering this research question are contained in Table 2.

The data presented in Table 2 showed that all the facilities and equipment for GM and the items were available to respondents with mean score of 3.1, 3.07, and 3.02; in urban areas and 2.61, 2.51 and 2.58 in rural centers. Notwithstanding the mean scores for the individual items, the grand mean scores of 3.1 and 2.51 showed the growth monitoring facilities were available in both urban and rural locations. The calculated p- value of <0.01 for the students T-test of the mean scores of availability of GM facilities implies that the availability of GM facilities differ based on location.

The data presented in Table 3 showed that out of three items posed to find out the utilization of GM facilities and equipment by mothers, respondents in urban centers had less utilization of facilities and equipment as seen in all the items. On the other hand, respondents in urban centers had less utilization of some of the

Table 1. Frequencies and percentage scores of CBW mothers in urban and rural centers on knowledge of GM.

Question	Urban Correct N(%)	Urban Incorrect (%)	Decision	Rural Correct N(%)	Rural Incorrect N(%)	Decision
1. CSS are steps taken to reduce illnesses that affect survival of U5s	314(95.2)	16(4.8)	VHL*	104(94.5)	6(5.5)	HL**
2. GM is a child survival strategy.	282(85.5)	48(14.5)	VHL	84(76.4)	26(23.6)	HL
3. GM involves measuring the child's weight and height regularly until 18 years	262(79.4)	68(20.6)	HL	77(70)	33(30)	HL
4. There is a GM card.	249(75.5)	81(24.5)	HL	77(70)	33(30)	HL
5. GM helps to find out illnesses in children.	282(85.5)	48(15.5)	VHL	86(78.2)	24(21.8)	HL
Total	278	84(52)	VHL	86(78)	24(22)	HL p = 0.04

*VHL: Very High Level; **HL: High Level.

Table 2. Mean scores of available facilities and equipment for GM in urban and rural areas.

	Urban Mean(SD)	Decision	Rural Correct N(%)	Decision
Clinics or health centers for growth monitoring of my children.	3.1(0.95)	A*	2.61(0.87)	A
Weighing scale	3.07(0.95)	A	2.51(0.85)	A
Measuring tape	3.07(0.95)	A	2.44(0.89)	LA**
Growth monitoring charts	3.02(0.96)	A	2.58(0.91)	A
Grand mean	3.1(0.05)	A	2.51(0.01)	A p<0.01

*A: Available; **LA: Less Available.

Table 3. Mean scores of utilization of facilities and equipment for GM in urban and rural areas.

	Urban Mean(SD)	Decision	Rural Correct N(%)	Decision
Clinic or health center for growth monitoring services	2.17(1.24)	LU**	2.61(0.87)	U*
Growth monitoring chart.	2.11(1.25)	LU	2.51(0.85)	U
Health facilities for management of weight loss.	2.53 (1.06)	LU	2.44(0.89)	LU
Grand mean	2.3 (0.21)	LU	2.51(0.01)	U p >0.01

*U: Utilized; **LU: Less Utilized.

facilities and equipments for GM as documented in item 3. The grand mean scores of 2.3 and 2.51 showed that rural mothers utilized GM facilities and equipment more than urban women. Therefore, the answer to research question 3 was that facilities and equipment for GM were more utilized by mothers in rural areas than in urban locations

Discussion

The index study has documented an extremely high level of knowledge of GM facilities in urban and rural health facilities in Enugu state although they were more available in urban areas. The study also documented lower utilization of GM facilities in urban areas compared to rural areas. These findings agree with the report by Okafor *et al.*[20] where respondents in urban and rural centers were aware of growth monitoring and respondents had knowledge of GM as a child survival strategy.[21] Growth monitoring helps in early detection of malnutrition and respondents in this study expressed high knowledge of this fact. It is quite impressive that a greater percentage of mothers to knew the importance of growth monitoring as this will enable them take adequate steps to prevent malnutrition and its complications, a leading causes of U5M[22,23] in their children. Other studies outside the continent have also reported high level of knowledge of growth monitoring.[12] It is widely known that knowledge, availability, and utilization of any facility are inter-related as knowledge of such facility is likely to increase its utilization where such facility is available. The fact that some mothers lack knowledge of GM is unacceptable, as they would likely not utilize these facilities to the detriment of their children. Therefore, it is expected that mothers should utilize available facilities especially where enabling environment is established and that health workers should increase the awareness of existence of these facilities through the use of available information, education and communication channels.

Findings on the availability of GM facilities and equipment in health facilities is consistent with reports by Bilal *et al.*[23] and Al-Hilfy and Essa[24] who noted that GM equipment were available in their respective studies. Availability of these equipment will ensure that GM which is an essential component of health care for all children will be carried out and will invariably help in early detection of nutritional and other health problems. AI-Hilfy and Essa[24] in Iraq observed that 85.8% of children were weighed at the registration visits. Bilal and colleagues also reported a high level of knowledge, great extent of availability and practice of GM among mothers although some mothers who possessed the growth chart could not read or understand it.[23] Other studies have documented varying levels of availability of GM facilities. A previous study in Nigeria by Nwala *et al.* found that GM facilities were available only in 41.8% of public and private hospitals surveyed.[25]

The index study also highlighted the dichotomy between knowledge and utilisation of GM in many developing countries. A study in India reported that only 24.8% of mothers had good knowledge regarding growth charts and 1.9% mothers used growth chart at home. Although the authors concluded that there was good knowledge of growth chart, the practice was found to be low.[12] Our study showed overall less utilization of GM facilities and equipment. It has been reported that only 50.4% of health workers in SSA carried out growth monitoring practices in healthcare facilities and the knowledge of mothers of GM facilities ranged from 53% to 87.6%.[13,21,22,25-27] A study in Ghana, indicated that 53% of the caregivers' had good (high) knowledge in Growth Monitoring and Promotion (GMP) activities, 98% had good (high) attitudes towards GMP activities and 70% had good (high) practices in GMP, only 16.2% of caregivers' children had faltered in growth.[27] In contrast, another Ghanaian study reported that only 28.5% out of four hundred mother-child pairs utilized GM practices while 60% had adequate knowledge of GM practices.[28]

In Calabar Nigeria, most of the mothers had adequate knowledge of CSS including 69.57% for growth monitoring, However, the actual practice of most of the components of CSS was poor as only 26.7%, practiced growth monitoring.[29] Most (85.1%) of their respondents obtained information on CSS from health workers.

These studies just as the index study contrasted with some other studies that documented great extent of utilization of GM facilities and equipment by their respondents.[21,23] The lower utilization of GM facilities among mothers in the urban areas may be related to the fact that these mothers patronized mainly the private owned facilities where growth monitoring facilities are sometimes unavailable. Where available, the need for continuous monitoring may not be emphasized as is the case with government owned facilities where education of mothers at each clinic visit is a priority. The findings in the index study calls for a change of attitude through enforcement of individual and community health campaigns in both urban and rural areas. The practice could improve if health workers increased their efforts towards awareness creation.

Health education and demonstration of benefits of growth monitoring by use of audio-visual aids during clinic attendance, and counseling of mothers on these benefits and the danger of not practicing them as they visit health facilities for antenatal, postnatal and child health services is advocated.

Limitations

The index study has some limitations. The study did not investigate the frequency, consistency, and proper utilization of GM facilities. The benefit of GM facilities will be apparent if the mothers' ability to consistently and correctly use the equipment were observed.

Conclusions

Although GM facilities were available in rural and urban health centers in Enugu state, they were less utilized especially in the urban areas despite the fact that mothers demonstrated were very high knowledge about these facilities. The dissociation between knowledge, availability and utilization demonstrates the need for public educationist to develop varied community and culturally specific approaches in public health education targeted towards mothers to improve the overall child survival and reduce child morbidity and mortality.

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