

Primary Health Care Workers' Role in Monitoring Children's Growth and Development in Nigeria, West Africa

Olugbenga-Bello Adenike I (Corresponding author) & Asekun-Olarinmoye Esther O

Department of Community Medicine, Faculty of Clinical Sciences

College of Health Sciences, Ladoke Akintola University of Technology (LAUTECH)

PMB 4400, Osogbo, Osun State, Nigeria

Tel: 234-803-383-9282 E-mail: nike_bello@yahoo.com

Adeomi Adeleye A

Department of Community Medicine

Ladoke Akintola University of Technology (LAUTECH) Teaching Hospital

PMB 5000, Osogbo, Osun State, Nigeria

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Abstract

Introduction: The success of growth monitoring and promotion (GMP) depends on the knowledge and expertise of the PHC workers. This study is therefore aimed at assessing PHC workers' knowledge, attitudes and practices regarding monitoring growth and development in Nigerian children.

Methods: This was a descriptive cross-sectional study; the population size was 3,105 PHC workers. Questionnaires were self administered by 372 respondents in 10 Health Centres in 10 Local government areas in Osun State, Nigeria.

Results: Though the PHC workers' awareness about GMP was high (95.2%), their knowledge of the procedures was however poor with only 49.2%, 30.6% and 29.3% knowing the regularity of growth monitoring for children at 0-1 year, 1-2years and 2-5years of age respectively. Furthermore, 37.1% did not know at what point on the growth chart is intervention necessary vis-a-vis the appropriate advice to give the mothers and the care to be instituted.

Conclusion: Despite a high level of awareness about GMP, a poor knowledge of the procedures and its interpretation was observed. Training and re-training of PHC workers at all levels in Nigeria is hereby recommended.

Keywords: Monitoring, Growth-chart, Knowledge, Attitude, Practice, Nigeria

1. Introduction

The World Health Organization [WHO](1986) defines growth monitoring and promotion (GMP) as a nutritional intervention that measures and charts the weight of children from 0 to 5 years of age and uses this information to counsel parents so that they take actions to improve child's growth. Disturbances in health and nutrition, regardless of their aetiology, almost always affect growth, thus growth assessment has been said to be the single most useful tool for defining health and nutritional status in children at both the individual and population levels (Beaton, Kelly, Kevany, Martorell & Mason, 1990; de Onis & Habicht, 1996; Mei, Yip & Trowbridge, 1998; Pinyerd, 1992).

Of the twenty four million children born each year in Africa, four million (16.6 percent) will not survive to see their fifth birthday, even though over 50% of these deaths are largely preventable through immunization, growth monitoring and timely interventions (Centre for disease control and prevention [CDC], 1998). The mortality rates among Nigerian children remain unacceptably high with infant and under five mortality rates of 87 per 1000 and 171 per 1000 respectively (National Population Commission (NPC) [Nigeria] & ICF Macro, 2009). The World Health Organization[WHO](2006) reports that 38.3% and 28.7% of under 5 children in Nigeria are stunted and underweight respectively.

Growth monitoring and promotion (GMP) has therefore been advocated worldwide as one of the key elements of child survival and primary health care strategies. The emphasis in most places has been on the measuring that is

the 'monitoring' rather than the 'promotion' of growth (Rohde, 2005). The term GMP rather than just growth monitoring was therefore used to emphasize that it assesses the growth and development of a child in order to detect the earliest changes and bring about appropriate responses to ensure that growth continues uninterrupted (Bhan & Ghosh, 1986). The growth or Road-to-health chart, designed by David Morley (Morley & Woodland, 1979) and modified by WHO, serves as a graphical representation of the child's physical growth and also for the longitudinal follow-up of the child. This helps in combating malnutrition through timely and early detection of faltering growth, because growth faltering can be detected long before any easily-observable sign or symptom of malnutrition becomes evident (Roberfroid, Lefevre, Hoeree & Kolsteren, 2005). This then helps to reduce infant and child mortality, because malnutrition is, in part, responsible for high rates of mortality of children aged less than five years, as observed in developing countries, (Pelletier, 1994; Schroeder & Brown, 1994) and thus boosts the achievement of the millennium development goals (Wright, Booth, Buckler, Cameron, Cole, Healy *et al.* 2002).

The GMP programme has however been criticised, some suggesting that the benefits of GMP programmes are minimal and/or imperceptible as well as questioned its efficacy (Ashworth, Shrimpton & Jamil, 2008; Garner, Panpanich & Logan, 2000; Gerein & Ross, 1991; Roberfroid, Kolsteren, Hoeree & Maire, 2005; Sabu, Latham, Abel, Ethirajan & Frongillo, 1993). Others have argued that the reportedly poor efficacy of GMP programme results from associated problems which are mainly the lack of adequately trained providers and not the problem of the programme itself (Chit, Kyi & Thwin, 2003; Maria, 2006; Rohde, 2005; Tonglet, Lembo, Zihindula, Wodon, Dramaix & Hennart, 1999). The effectiveness and success of this important child survival strategy therefore depends on the knowledge, skills and expertise of the primary health workers, since the actual GMP should be carried out by them and they are the backbone of primary health care (Declaration of Alma Ata, 1978).

A study carried out by Bhasin (1995) among primary health workers in India to determine their knowledge on growth monitoring, revealed that 90% had adequate knowledge about the significance of the lines on the growth monitoring chart, but only 43% knew the correct age at which growth monitoring should begin. In a Belgian study (Roberfroid, Lefevre, Hoeree & Kolsteren, 2005), where an international panel of District Medical Officers were interviewed on growth monitoring practice and promotion; it was discovered that the doctors had limited knowledge of the interpretation of the growth chart, though they considered it a tool for diagnosis.

This study was therefore carried out to assess primary health care workers' knowledge, attitudes and practices regarding monitoring growth and development in Nigerian children with a view to making necessary recommendations to improve the effectiveness of GMP.

2. Materials and Methods

2.1 Study Area

The study area was Osun State, located in the south-western part of Nigeria with Osogbo town as its capital. The state has a population of approximately 3.5 million (National Population Commission [NPC], 2006). The study population is 3,105 health workers including doctors, nurses/mid-wives and community health extension workers.

2.2 Sampling Technique

This was a descriptive cross-sectional study wherein the multi-stage sampling technique was used in selecting the respondents. Multi-stage sampling is a probability sampling technique where selection is done in stages until the final sampling units are arrived at (Araoye, 2004). At the first stage, ten out of the 30 local government areas in the state were selected randomly. One primary health centre was then selected at random from each of the 10 local government areas to make the second stage. At the third and final stage, all the health workers in the ten selected primary health centres, who consented, were interviewed to make a total of 372 respondents. The PHC workers included were doctors, nurses/midwives and community extension workers (CHEW) working in the Local Government primary health centres. The study was explained to the health workers and a verbal consent obtained.

2.3 Ethical Issues

Ethical approval was obtained from the Ethical committee of LAUTECH Teaching Hospital, Osogbo, Nigeria. Permission to conduct the study was obtained from the State Ministry of Health and verbal consent was obtained from individual respondents before including them in the study.

2.4 Data Analysis Processes

The data were gathered with the aid of pre-tested semi-structured questionnaires developed by the authors after a careful literature review. The questionnaires were distributed by trained research assistants and self-administered by respondents. Ten research assistants were assigned to the ten selected primary health centres, and they visited

these centres weekly for a period of two months to ensure all consenting PHC workers had access to the questionnaires. The filled questionnaires were then collected by the research assistants. The questionnaires were manually checked for errors and the data were analysed using the Statistical Package for Social Scientists (SPSS) version 15 with the generation of frequency tables.

3. Results

3.1 Socio-Demographic Characteristics of Respondents

Three hundred and seventy two questionnaires were distributed, supervised and returned by research assistants, to make a response rate of 100%. The respondents were between the ages of 15 and 60 years. Twenty nine percent of the 372 respondents' ages ranged between 26-30 years (n=108) and 21.8% between 36-40 years (n=81) (table 1). Three hundred and eight (82.8%) respondents were females and 264/372 were married (71.0%). Of the 372 respondents, 204 were community health extension workers (CHEWs) (54.2%), 118 were nurses (31.7%) and 50 were Doctors (13.4%).

3.2 Knowledge of Growth Monitoring Procedures

A large percentage of the respondents (95.2%) had heard of the road-to-health chart; Doctors (100%), Nurses (94.4%) and CHEWs (94.1%). Forty-six percent of those aware heard about the chart in schools, while only 15.0% became aware of it through workshop/seminars. Most of the respondents, 91.1% knew that the GC is used in monitoring and recording of the weight of children; Doctors (100%), Nurses (89%) and CHEWs (90.2%). One hundred and eighty three (49.2%) of respondents knew that children between 0-1 years should be weighed monthly; Doctors (24%), Nurses (97.5%) and CHEWs (82.2%). One hundred and fourteen (30.6%) knew that GM should be done every two months for children between 1-2 years [Doctors(20%), Nurses(69.5%) and CHEWs(32.4%)] and 29.3% knew it should be done every 3 months for children 2-5 years; Doctors(12%), Nurses(81.4%) and CHEWs(12%).

3.3 Respondents Knowledge on the Interpretation of Road-to-Health Chart

On the interpretation of growth monitoring charts, 200(53.8%) of respondents knew that a plotted line that deviates upwards and above the upper limit of normal means the child is gaining excess weight. Of the 200 respondents, 36(72%) were doctors, 88(74.6%) were nurses and 76(7.3%) were CHEWs. Most of the respondents understood that a downward deviation of the plotted line below the lower limit of normal means inadequate weight gain (92.5%), (100%; 96.6% and 88% for doctors, Nurses and CHEWs respectively), a plotted horizontal line means failure to grow (74.0%) and that intervention is necessary when the dotted line is outside the reference lines (62.9%, with only 38.2% of the CHEWs). However, only 21.2% of the respondents knew the lower limit of normal for birth weight to be 2.5kg.

3.4 Attitudes of Respondents towards Growth Monitoring and Promotion

Majority of respondents (98.4%) had positive attitude towards GM agreeing that GM is necessary for the overall well-being of children and that it is effective in improving health status of children. Eighty percent felt that the process of GM is convenient, 12.9% of respondents however considered the process to be time consuming; Doctors (16%), Nurses(13.6%) and CHEWs(21.6%). A large percentage of respondents (93.5%) also believed that all children less than 5 years old require constant growth assessment and monitoring irrespective of their current health status.

3.5 Respondents Practice of Growth Monitoring and Promotion

Three hundred and thirty two (89.2%) of the respondents alleged that GM was practised in their centres. Most of the respondents (93.5%) would undress the child before weighing for accurate weight and would clean the scale after weighing each child (95.2%).

4. Discussion

There was a poor knowledge of the procedures of growth monitoring with more than half not knowing the regularity of growth monitoring. Many of the respondents also had a poor knowledge of the correct interpretation of the GC. Only about half of the respondents could correctly interpret an upward deviation of the plotted line above the upper limit of normal and only one fifth knew the lower limit of normal for birth weight to be 2.5kg. In a similar study by Kapil(1987) in India, only 43% of the PHC workers interviewed knew the lower limit of normal for birth weight to be 2.5kg. Roberfroid, Pelto and Kolsteren (2007), also reported that a third to three-fourth carers in developing countries do not understand the growth chart and therefore its relevance to child nutrition and survival and that the low practice of growth monitoring and promotion (GMP) in developing countries may be because of this. Other studies have also suggested that the poor understanding of the GC and its purposes and

procedures by health workers is a major reason for the GMP falling into disrepute (Ashworth, *et al*, 2008; Roberfroid, Lefevre, Hoeree & Kolsteren, 2005; Rohde, 2005).

None of the doctors in this study knew that the lower limit of normal for birth weight was 2.5kg and less than a quarter of them knew the regularity of GM. This calls for concern since the doctors are supposed to be the leaders of the health team whose responsibility is to take diagnostic and therapeutic interventional decisions when necessary for the survival of the children and they bear the responsibility of implementing GMP programmes at the local level. One key issue that may be responsible for the poor knowledge is the lack of training and re-training of the PHC workers on GMP. Many previous studies have emphasized the importance of training PHC workers in the success of GMP programmes (Ashworth, *et al*, 2008; Faber, Schoeman, Smuts, Adams & Ford-Ngomane, 2009; Gopalan & Chatterjee, 1989). A prospective case control study on knowledge and utilization of GMP carried out by Bella and Al-Ghamdi in Saudi Arabia (1998) revealed significant improvements in the knowledge and practices of both health workers and mothers after training compared to the control groups. Another reason for the poor knowledge may be the importance attached to GMP by the PHC workers especially the doctors. Roberfroid, Lefevre, Hoeree and Kolsteren, (2005) in their study of the perception of GMP among an international panel of medical officers reported a lack of conviction about GMP and the fact that GMP appeared quite secondary in primary health care to these medical officers who were mainly from Sub-Saharan Africa. This may be another reason for more work to be done on the acceptability, usability and feasibility of GMP as has been suggested by previous studies (Ashworth, *et al*, 2008; Roberfroid, Kolsteren, Hoeree & Maire, 2005; Roberfroid, Lefevre, Hoeree & Kolsteren, 2005; Rohde, 2005).

The poor knowledge of GMP procedures and the interpretation of the GC was marked among the CHEWs with only 10% and 4% knowing the regularity of GM for children 1 – 2 years and 2 – 5 years age respectively and with only two fifths knowing when intervention was necessary. This very low level of knowledge by the CHEWs is a cause for concern in this poor resource setting where there is a dearth of doctors and nurses/midwives and the bulk of the primary health care is delivered by CHEWs (Chankova, Nguyen, Chipanta, Kombe, Onoja & Ogungbemi, 2007; Uneke, Ogbonna, Ezeoha, Oyibo, Onwe & Ngwu, 2008). It is therefore important for the CHEWs to have basic understanding of the GC and its interpretation so as to know when to advise on early corrective measures that have to be implemented by the mother in case of any faltering in weight or refer the child if and when necessary.

Almost all the respondents (98.4%) agreed that GM is necessary for the overall well-being of children, that it is effective in improving the health status of children and that all children should have their growth monitored. Similarly, previous studies generally reported a positive attitude towards GM (Roberfroid, Lefevre, Hoeree & Kolsteren, 2005). Thirteen percent however said that it is time consuming and hence difficult to implement. This percentage is very modest but still important because of the busy clinics and relatively insufficient health workers in many of the PHCs in Nigeria. The issue of time is therefore an important factor in determining the workability of GM at the primary health centres in developing countries like Nigeria, but there is need for more research to investigate this.

Malnutrition continues to be a serious problem in developing countries and a major threat to the achievement of the MDG, (Alberto & Francesco, 2007; Antony & Laxmaiah, 2008; Usfar, Achadi, Martorell, Hadi, Thaha, Jus'at *et al*., 2009) and so all strategies with a potential of helping to combat this scourge (like GMP) must be adequately explored. Even though there have been calls from some academicians for the elimination of GMP from community-based programmes, (Davies, 2000; Dixon, 1993) a more appropriate appeal may be for more studies to explore better ways for GMP programmes (Rohde, 2005).

5. Conclusion and Recommendation

The high level of awareness and positive attitude towards GMP and GC of majority of respondents were at dissonance with their level of knowledge of the GMP procedures and the interpretation of the GC. None of the doctors in this study knew the lower limit of normal for birth weight to be 2.5kg. We recommend further studies, especially with larger sample size in Nigeria and other developing countries. Training and re-training of PHC workers through seminars, workshops and conferences at all levels is also recommended.

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Table 1. Socio-demographic Characteristics of Respondents (n=372)

Variables	Frequency(Percentage)
<i>Ages (years)</i>	
15-20	26(7.0)
21-25	44(11.8)
26-30	108(29.0)
31-35	44(11.8)
36-40	81(21.8)
41-45	32(8.6)
46-50	20(5.4)
51-55	14(3.8)
56-60	3(0.8)
<i>Religion</i>	
Christianity	276(74.2)
Islam	76(20.4)
Traditional	13(3.5)
Others	7(1.9)
<i>Ethnicity</i>	
Yoruba	354(95.2)
Igbo	9(2.4)
Hausa	5(1.3)
Others	4(1.1)
<i>Marital Status</i>	
Married	264(71.0)
Single	93(25.0)
Divorced	5(1.3)
Widow/Widower	10(2.7)
<i>Gender</i>	
Female	308(82.8)
Male	64(17.2)
<i>Job Designation</i>	
Community health workers	204(54.8)
Nurses	118(31.7)
Doctors	50(13.4)

Table 2. Knowledge of GMP Procedures among Respondents

Variables	Frequency (Percentage)			
	Doctors	Nurses	CHEWs	Total
<i>Awareness of Growth chart</i>				
Yes	50(100.0)	112(94.9)	192(94.1)	354(95.2)
No	0(0.0)	6(5.1)	12(5.9)	18(4.8)
Total	50(100)	118(100)	204(100)	372(100)
<i>Source of knowledge about Growth chart</i>				
In school	32(64.0)	32(27.1)	99(48.5)	163(43.8)
Health centre/hospital	18(36.0)	78(66.1)	42(20.6)	138(37.2)
Seminars/workshop	0(0)	2(1.7)	51(25.0)	53(14.2)
Non Response	0(0)	6(5.1)	12(5.9)	18(4.8)
Total	50(100)	118(100)	204(100)	372(100)
<i>Purpose of the Growth chart</i>				
Monitoring height of children	0(0)	3(2.5)	4(2.0)	7(1.9)
*Monitoring weight of children	50(100.0)	105(89.0)	184(90.2)	339(91.1)
Don't know	0(0)	10(8.5)	16(7.8)	26(7.0)
Total	50(100)	118(100)	204(100)	372(100)
<i>Respondents' knowledge of: Frequency of GM for age groups 0-1 year</i>				
*Monthly	12(24.0)	115(97.5)	56(27.4)	183(49.2)
Bimonthly	38(76.0)	3(2.5)	4(2.0)	45(12.1)
Don't know	0(0)	0(0)	144(70.6)	144(38.7)
Total	50(100)	118(100)	204(100)	372(100)
<i>Frequency of GM for age groups 1-2 years</i>				
Monthly	40(80.0)	36(30.5)	36(17.6)	112(30.1)
*Every 2 months	10(20.0)	82(69.5)	22(10.8)	114(30.6)
Don't know	0(0)	0(0)	146(71.6)	146(39.2)
Total	50(100)	118(100)	204(100)	372(100)
<i>Frequency of GM for age groups 2-5 years</i>				
Monthly	0(0)	0(0)	8(3.9)	8(2.2)
Bimonthly	44(88.0)	16(13.6)	4(2.0)	64(17.2)
*Every 3 months	6(12.0)	96(81.4)	8(3.9)	110(29.6)
yearly	0(0)	6(5.1)	28(13.7)	34(9.1)
Don't know	0(0)	0(0)	156(76.5)	156(41.9)
Total	50(100)	118(100)	204(100)	372(100)

*Represent the correct options.

Table 3. Respondents Knowledge on the Interpretation of Road-to-Health Chart

Variables	Frequency(Percentage)			
	Doctors	Nurses	CHEWs	Total(%)
<i>Deviation of plotted line above the¹upper reference curve</i>				
Weight gain is normal and good	14(28.0)	14(11.9)	92(45.1)	120(32.3)
*Excess weight gain	36(72.0)	88(74.6)	76(37.3)	200(53.8)
I don't know	0(0.0)	16(13.6)	36(17.6)	52(14.0)
Total	50(100)	118(100)	204(100)	372(100)
<i>Deviation of plotted line below the²lower reference curve</i>				
Weight gain is normal and good	0(0.0)	0(0.0)	0(0.0)	(0.0)
*Weight gain is inadequate	50(100.0)	114(96.6)	180(88.2)	344(92.5)
I don't know	0(0.0)	4(3.4)	24(11.8)	28(7.5)
Total	50(100)	118(100)	204(100)	372(100)
<i>Meaning of a plotted horizontal line after sickness of the child</i>				
There is no problem	8(16.0)	22(18.6)	56(27.5)	86(23.1)
*Failure to grow due to infection	42(84.0)	96(81.4)	138(67.6)	276 (74.2)
I don't know	0(0.0)	0(0.0)	10(4.9)	10(2.7)
Total	50(100)	118(100)	204(100)	372(100)
<i>Lower limit of normal for birth weight</i>				
Birth weight 3.5kg				
*Birth weight 2.5kg	48(96.0%)	6(5.1)	0(0.0)	54(14.5)
Birth weight 1.5kg	0(0.0)	31(26.3)	48(23.5)	79(21.2)
Total	2(4.0)	81(68.6)	156(76.5)	239(64.2)
	50(100)	118(100)	204(100)	372(100)
<i>Indication for Intervention;</i>				
Plotted line is between the 2 reference curves.	0(0.0)	12(10.2)	71(34.8)	83(22.3)
*Plotted line is outside the 2 reference curves.	50(100.0)	106(89.8)	78(38.2)	234(62.9)
I don't know	0(0.0)	0(0.0)	55(27.0)	55(14.8)
Total	50(100)	118(100)	204(100)	372(100)

*Represent the correct options; ¹ Upper limit of normal; ² Lower limit of normal

Table 4. Attitudes of Respondents towards Growth Monitoring

Variables	Frequency(Percentage)			
	Doctors	Nurses	CHEWs	Total
<i>GM is necessary</i>				
Positive	50(100.0)	112(94.9)	204(100)	366(98.4)
Negative	0(0.0)	6(5.1)	0(0.0)	6(1.6)
Total	50(100)	118(100)	204(100)	372(100)
<i>GM is effective in improving the health of children</i>				
Positive	48(96.0)	112(94.9)	98(97.1)	358(96.2)
Negative	2(4.0)	6(5.1)	6(2.9)	14(3.8)
Total	50(100)	118(100)	204(100)	372(100)
<i>The process of GM is time consuming</i>				
Positive	8(16.0)	16(13.6)	24(11.8)	48(12.9)
Negative	42(84.0)	102(86.4)	180(88.2)	324(87.1)
Total	50(100)	118(100)	204(100)	372(100)
<i>The process of GM is cumbersome</i>				
Positive	2(4.0)	4(3.4)	0(0.0)	6(1.6)
Negative	48(96.0)	114(96.6)	204(100)	366(98.4)
Total	50(100)	118(100)	204(100)	372(100)
<i>The process of GM is convenient</i>				
Positive	40(80.0)	98(83.1)	160(78.4)	298(80.1)
Negative	10(20.0)	20(16.9)	44(21.6)	74(19.9)
Total	50(100)	118(100)	204(100)	372(100)
<i>All children need GM</i>				
Positive	48(96.0)	104(88.1)	196(96.1)	348(93.5)
Negative	2(4.0)	14(11.9)	8(3.9)	24(6.5)
Total	50(100)	118(100)	204(100)	372(100)
<i>Only children at risk of infection needs GM</i>				
Positive	2(4.0)	14(11.9)	8(3.9)	24(6.5)
Negative	48(96.0)	104(88.1)	196(96.1)	348(93.5)
Total	50(100)	118(100)	204(100)	372(100)

Table 5. Respondents Practice of Growth Monitoring

Variable	Frequency(Percentage)			Total(%)
	Doctors	Nurses	CHEWs	
<i>GM is practised in my health centre</i>				
Yes	48(96.0)	116(98.3)	168(82.4)	332(89.2)
No	2(4.0)	2(1.7)	36(17.6)	40(10.8)
Total	50(100)	118(100)	204(100)	372(100)
<i>Undress the child to get accurate weight.</i>				
Yes	48(96.0)	104(88.1)	196(96.1)	348(93.5)
No	2(4.0)	14(11.9)	8(3.9)	24(6.5)
Total	50(100)	118(100)	204(100)	372(100)
<i>Clean the scale after each child is weighed.</i>				
Yes	44(88.0)	114(96.6)	196(96.1)	354(95.2)
No	6(12.0)	4(3.4)	8(3.9)	18(4.8)
Total	50(100)	118(100)	204(100)	372(100)