

Knowledge, utilization and factors affecting utilization of growth monitoring and promotion for under two children in Butajira, Ethiopia

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Abstract

Background: Growth monitoring and promotion is a prevention activity against malnutrition. It is comprised of growth monitoring, linked with promotion that increases awareness about child growth and serves as the core activity in an integrated child health and nutrition program. However, the knowledge and utilization of growth monitoring and promotion services is inadequate in Butajira, Ethiopia.

Objective: To assess knowledge and utilization of growth monitoring and promotion and factors affecting utilization of growth monitoring and promotion in under two children in Butajira, Southern Nations, Nationalities and Peoples Region, Ethiopia.

Method: Community based cross sectional study was conducted from April-May 2017. A total of 548 child less than two years old and mother who reside in Butajira were selected using simple random sampling method. The data were entered using Epidata version 3.1 and analyzed using STATA version 14 software. Multivariable logistic regression model was fitted to predict the association between utilization of growth monitoring and promotion and its determinants.

Results: From 507 mother-child pair participants with response rate 93% utilization of growth monitoring and promotion was 11% [95%CI=8.4%-13.8%] while 64% [95%CI= 60%-68%] of the mothers had adequate child feeding and growth chart knowledge. The result showed that utilization of growth monitoring and promotion had significant association with mothers with level of education; i.e elementary education [AOR=3.3(95%CI=1.50, 6.02)] and secondary education and above [AOR=3.33(95%CI=1.30, 8.50)], occupation; farmer [AOR=4.0(95%CI=1.32,8.50)], availability of weight measurement service [AOR=4.65(95%CI=1.72, 12.59)] and mother's child feeding and growth monitoring knowledge [AOR =4.87 (95%CI =1.80, 13.16)].

Conclusion: Growth monitoring and promotion is not being implemented as per the recommendation. Utilization of growth monitoring and promotion is very low in rural kebeles of Butajira. Monitoring implementation of growth monitoring and promotion should be implemented throughout the country to ensure the welling of children enabling early detection of nutritional problem.

Key words: Growth monitoring and promotion, family card, Butajira, under two children, Ethiopia

Introduction

Malnutrition continues to be one of the world's most serious development problems (WHO 2002). Exacerbating the consequences of infectious disease, malnutrition contributes to about six million deaths annually of children under two years (Robert 2008). While low and middle-income countries bear the brunt of the problem, malnutrition affects both rich and poor countries, particularly the poorest in each nation including Ethiopia (James 2007). It also commonly affects all groups in a community, but infants and young children are the most vulnerable because of their high nutritional requirements for growth and development (Robert 2008).

The most cost-effective way to address the pressing public health challenge of malnutrition is to prevent it (Marcia 2007). The government of Ethiopia and a range of non-governmental organizations are working on prevention and promotion activities to fight malnutrition in children. One of these activities is growth monitoring and promotion (GMP).

Theoretically, in GMP, every child's weight is measured periodically, giving primary focus to children below the age of two years (under-two children). The measurement starts at birth and should be performed on a monthly basis, accurately recorded on a growth chart, and interpreted. Additionally, the health workers provide services, such as giving information through counseling, facilitating communication, and interacting with mothers in a way that aims to generate adequate maternal action to promote child growth (FMoH a 2016; WHO 2009; Mangasaryan 2011). Growth monitoring of young children is recognized as an effective means of detecting growth faltering early, providing a critical opportunity for taking the preventive or curative actions needed (UNCIF 2008). There is a lack of knowledge among mothers regarding what, when, and how to feed their children. Mothers' awareness of GMP was low compared to their awareness of immunization (Selamawit 2014).

Growth monitoring and promotion has been implemented as nutrition specific intervention in

Ethiopia since 2008 (FMoH b 2016). However, there are no substantial number of published articles on utilization of growth monitoring and promotion and associated factors among mothers with under two child in Butajira, Ethiopia. The result of the study will be valuable to inform policy makers and nutrition program on factors that predict utilization of growth monitoring and promotion, guide to formulate strategies to improve nutrition services to the target groups, the community and to be used as a baseline evidence for other researchers in the area.

Materials and Methods

Study setting and design: The study was conducted in Butajira area which is located in Guraghe zone of Southern Nations, Nationalities and Peoples Region (SNNPR) of Ethiopia. Nine rural and one urban areas were under follow up for over 30 years by the Butajira health and demographic surveillance system. There is one health post in each of the nine rural kebeles. Each of the rural kebeles had one health post (Yemane 2004; Lieu 2015). Community based cross sectional study was employed from April-May 2017.

Source and study population: All child mother pair aged less than 24 months who resides in demographic surveillance system of Butajira site during the study period were the source population. Child mother pairs aged less than 24 months who resides in Butajira during the study period were selected by lottery method.

Sample size determination: A Single population-proportion formula ($n = Z\alpha/2^2 p (1-p)/d^2$) was used to determine the sample size. The assumption used to estimate the sample size were prevalence of 32% taken for GMP knowledge from Ghana (Gyampoh 2014) with, confidence level of 95% , marginal error of 4% and considering 5% non-response rate. The final total sample size was 548.

Sampling procedure: All the nine rural kebeles in which growth monitoring and promotion implemented were included to obtain the desired sample size. Initially sampling frame containing list of mother child pairs less than two years old along with their date of birth and house number was obtained from Butajira site. This sampling frame was obtained for a total of 2073 mother child pairs less than two years old pair registered by Butajira DSS. By using this sampling frame simple random sampling technique was used to select a total of 548 samples from the kebeles.

Operational definition:

GMP Utilization: ability to attend two or more of growth monitoring and promotion sessions for children less than six month and ability to attend three or more of growth monitoring and promotion

sessions for children above six months. In addition. It should be plotted or recorded on the child growth chart.

knowledge: A mother is considered knowledgeable if she currently knows to start breastfeeding within one hour of delivery, exclusive breastfeeding for the first six months and introduction of different food groups (water, grain, cereal, meat, milk, egg, vegetable and fruit) within 6-8 months of age with continued breast feeding, first thing child take after birth should be breast milk, increase the frequency of meal for sick child, increase the frequency of meal as child age increase and ability to read the growth chart and know the benefit of regular GMP utilization. From total knowledge score of 17 mother who scored 11 were considered as having adequate knowledge and mother scored below 11 were considered as having inadequate knowledge. In addition, correct answer is recorded as “Yes” and “No” recorded as incorrect and don’t know answers.

Data processing and analysis: Collected data were coded, cleaned using EPI data 3.1 analyzed using STATA version 14. Continuous variables were expressed as mean $\pm$ standard deviation. Categorical variables were expressed by using frequency and percentage. Cross-tabulation with frequencies and percentage of each variable was performed to explore the relationship between the dependent variable and independent variables. Multivariable logistic regression model was fitted to predict the association between knowledge and utilization of GMP and factor affecting utilization of GMP. For numerical variables, bivariate analysis was first done to identify candidate variables for multivariable logistic regression. Those variables with a $P < 0.05$ were moved to multivariable analysis to identify their significance with the dependent variable. All statistical analysis were set at 5% level of significance (i.e. $p < 0.05$). The results were reported as Odds Ratio and 95% CI. Dependent variables were also reported as frequency, percentage and 95% CI.

Ethical approval and informed consent of participants:

The study was approved by the Research Ethics Review Committee of School of Public Health, College of Health Science at Addis Ababa University under protocol number 025/16/SPH. In addition the study was cleared at the district health office. Verbal consent was taken from each selected study participant and was obtained after honest explanation of the survey purpose, description of the benefits and risk were made to the study participants. Privacy and confidentiality of collected information were ensured by using anonymous data collection tools.

Results

Demographic and socio-economic characteristics of households: Table 1 shows the socio demographic characteristics of study participants. Altogether 507 care givers and children pair were participated with 93% response rate. All of the care givers were mothers

of the child. The mean ($\pm$ SD) age (month) of the children was 11($\pm$ 6.3 SD) and ranged from 0 to 23 months. The mean ($\pm$ SD) age (year) of the mother in the study sample was 28.9($\pm$ 5.6 SD).

Table 1: Demographic and socioeconomic characteristics of the study participants, Butajira, Ethiopia, 2017

Variable		Frequency	Percent
Child sex	Male	265	52.3
	Female	242	47.7
Child age	0-5month	115	22.7
	6-11month	162	32
	12-17month	131	25.8
	18-23month	99	19.5
Delivery place	Health facility	331	65.3
	Home	176	34.7
Mode of delivery	Vaginal delivery	486	95.9
	Caesarian section	21	4.1
Vaccination	All basic vaccination	473	93.7
	No vaccination	32	6.3
Mother age	15-19	11	2.2
	20-24	84	16.6
	25-29	173	34.1
	30-34	121	23.9
	35-39	90	17.7
	>40	28	5.5
Educational status of the mother			
	Not able to read and write	248	48.9
	Read and write	30	5.9
	Elementary	145	28.6
Occupation of the mother	Secondary and above	84	16.6
	House wife	435	85.8
	Farmer	13	6.1
	Merchant	41	8.1
Marital status	Married	500	98.6
	Divorced	6	1.2
Occupation of the father	Secondary and above	105	20.8
	Farmer	407	80.7
	Merchant	38	7.6
	Government employee	22	4.4
	Other	37	7.3
Own land to cultivate	Yes	450	88.8
	No	57	11.2
Access to media	Yes	276	54.4
	No	231	45.6

Other¹ private employee, daily laborer

Health service related characteristic: The response of study participants indicated that 267(52.7%) travel less than one hour to reach to their nearest health facility and 54(10.7%) of them travel more than an hour to get to their nearest health facility. Almost half of respondents utilize health post 216(51.5%) more

frequently and followed by health center 206(40.6%) for their child. Regarding the health service that are available for the child in health facilities 269(53.1%) of mother mentioned that weight measurement were available and 313(61.5%) mentioned they had received nutritional advice for their child (Table 2).

Table 2: Availability and accessibility of health service for child mother pairs, Butajira, Ethiopia, 2017

Variable		Frequency	Percent
Time to reach to the nearest health facility	>one hour	240	47.3
	<one hour	267	52.7
Most frequently utilized health institution for the Child	Health center	206	40.6
	Health post	216	51.6
	Other ²	40	7.9
Weight measurement	Yes	269	53.1
	No	238	46.9
Nutritional advice	Yes	313	61.7
	No	194	38.3
Immunization	Yes	479	94.5
	No	28	5.5
Medical care	Yes	455	89.7
	No	52	10.3
Vitamin A supplementation	Yes	293	57.8
	No	214	42.2

Other² Traditional medicine, private clinic, hospital

Mothers' child feeding and growth monitoring knowledge: Participates were asked different questions to assess their child feeding knowledge and their ability to read WHO weight-age growth chart for under two child. Child feeding and growth monitoring knowledge assessed using different variables like time for early initiation of breast feeding, first thing that the child should take after birth, exclusive breast feeding, continue breast feeding with additional meal, food frequency per day for sick child, ability to interpret the growth monitoring chart, food frequency based on child age, age to initiation of complementary feeding with different food group.

Out of the 507 surveyed participants, 277 (63.4%) mothers were able to indicate the recommended age for introducing other foods to the child except meat.

Four hundred ninety three (97.2%) of the participants stated first thing that the child should take after birth should be mothers breast milk feeding while 14(2.8%) of them mentioned other than breast milk. Close to 90% of the mothers mentioned early initiation of breast feeding should be within the first hour of delivery. With regard to exclusive breast feeding 411(81.1%) of them mentioned that the child should exclusively be feed for the first six months. Only 106(20.9%) of the mothers were able to interpret the growth curve (rising, falling and flatten). Among the participants 296 (58.4%) know regular utilization of GMP has benefit for the child growth. As a whole 325 (64%) of the mothers had adequate knowledge and 182 (36%) had inadequate knowledge about child feeding and growth monitoring chart (Table 3).

Table 3: Variables used to assess mothers child feeding and growth chart knowledge, Butajira, Ethiopia, 2017

Variable	Response	
	Correct/ Adequate* n(%)	Incorrect / Inadequate** n(%)
Knowledge about breast feeding		
Frist thing the child should take after birth	493(97.2)	14(2.8)
Early initiation of breast feeding	454(89.6)	53(10.4)
Exclusive breast feeding	411(81.1)	96(18.9)
Continue BF with meal	496(97.8)	11(2.2)
Food frequency/day if the child is sick	219(43.2)	288(56.8)
Food group and recommended age		
Water	406(80.1)	101(19.9)
Fruit	354(69.8)	153(25.4)
Grain	378(30.2)	129(74.6)
Milk	438(86.4)	69(13.6)
Egg	321(63.3)	186(36.7)
Vegetable	282(56.3)	219(43.7)
Meat	160(36.6)	277(63.4)
Meal frequency/day based on child age		
6-8 month child with breast feeding	427(84.2)	80(15.8)
9-23month child with breast feeding	452(89.2)	55(10.9)
6-23 month child without breast feeding	376(74.2)	131(25.8)
Able to understand growth chart	106(20.9)	401(79.1)
Know regular utilization of GMP has benefit for the child	296(58.4)	211(41.6)
Knowledge about GMP and child feeding	325(64%)*	182(36%)**

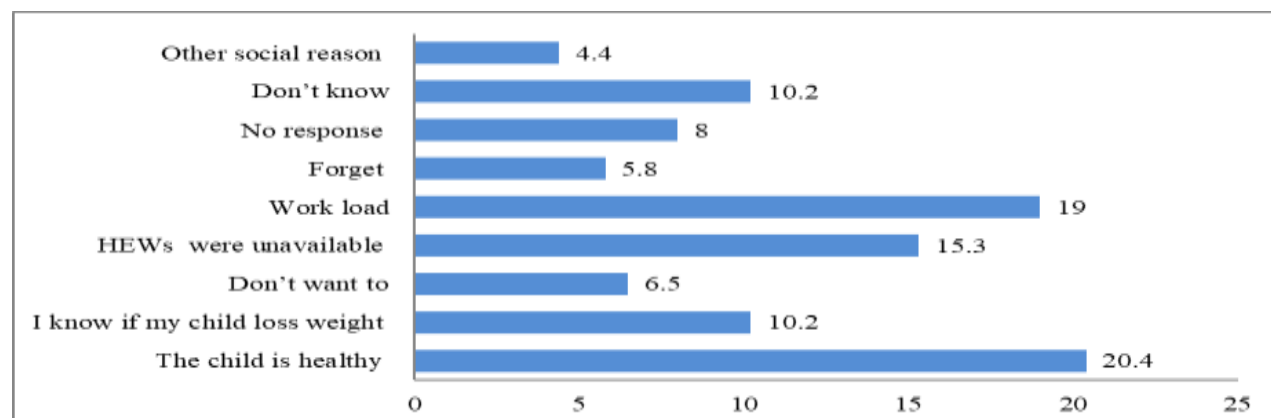
* Indicates adequate and ** indicate inadequate scored knowledge about GMP and child feeding

Utilization of growth monitoring and promotion:

Key indicators used to assess growth monitoring and promotion utilization in this study included availability of the family health card; whether it had been plotted or not; if plotted the number of time was taken and the regularity of session was taken. In this study both utilizing the services regularly and irregularly were considered as utilizers. The study finding indicated that only 137(27%) study participants have family health card at the time of data collection. Of the participants only 55(10.9%),

[95%CI=8.4%-13.8%], have family health card that had been marked or plotted on weight and age; these are considered as utilizers of the GMP service. Majority of participants 370(72.98%) have no family health card at the time of data collection.

Those mothers who had the family health card were asked about their reason for not being able to regularly utilize GMP. Accordingly, mothers mentioned their reason for not regularly utilizing GMP as the child is healthy 20.4% and work load they got 19%. (Figure 1)

**Figure 1: Mothers reason for not utilizing GMP regularly (n=137), Butajira, Ethiopia, 2017**

Relationship between utilization of GMP and other factors: The multivariable logistic regression showed that, mother educational status, mother occupation, availability of weight measurement service and knowledge were significantly associated with utilization of GMP. Mothers with elementary educational level were 3.31 time more likely utilize GMP [AOR=3.31(95%CI=1.50, 6.02)] while mothers with secondary and above education level were 3.33

times more likely utilize GMP than mothers who can't read and write [AOR=3.33(95%CI=1.30,8.50)]. Regarding occupation of the mother, framers were 4.03 times more likely to utilize GMP than house wives [AOR=4.03(95%CI=1.32, 8.50)]. Mothers with adequate knowledge on child feeding and growth chart were about five times more likely utilize GMP than those mothers with inadequate knowledge [AOR=4.87(95%CI=1.80,13.16)] (Table 4) .

Table 4: Bivariate and multivariable logistic regression analysis of factors associated with utilization of GMP, Butajira, Ethiopia, 2017 (n=507)

Characteristic	Utilization		COR 95%(CI)	AOR 95%(CI)
	Yes n (%)	No n (%)		
Mother educational status				
Not able to read and write	13(5.2)	235(94.8)	1	
Read and write	5(16.7)	25(83.3)	3.61(1.19-10.98)*	1.83(0.55-6.02)
Elementary	22(15.2)	123(84.8)	3.23(1.57-6.64)*	3.31(1.50-6.02)*
Secondary and above	15(17.9)	69(82.14)	3.93(1.78-8.66)*	3.33(1.30-8.50)*
Occupation of the mother				
House wife	41(9.4)	394(90.6)	1	
Farmer	10(32.3)	21(67.7)	4.58(2.02-10.38)*	4.03(1.32-8.50)*
Merchant	4(9.8)	37(90.2)	1.20(0.32-4.51)	1.84(0.53-6.36)
Occupation of the father				
Farmer	44(10.8)	363(89.2)	1	
Merchant	3(7.9)	35(92.1)	0.71(0.21-2.39)	0.53(0.14-2.03)
Government employee	6(27.2)	16(72.7)	3.09(1.15-8.32)*	0.86(0.23-3.12)
Other	2(5.4)	35(94.6)	0.47(0.11-2.03)	0.25(0.05-1.24)
Time taken to reach to nearest health facility				
>an hour	17(7.1)	223(92.9)	1	
<an hour	38(14.2)	229(85.8)	2.17(1.19-3.97)*	1.69(0.84-3.42)
Availability of Weighting				
No	8(3.4)	230(96.6)	1	
Yes	47(17.5)	222(82.5)	6.09(2.81-13.17)*	4.65(1.72-12.59)*
Availability of nutrition advice				
No	10(5.2)	184(94.8)	1	
Yes	45(14.4)	268(85.6)	3.09(1.52-6.28)*	0.82(0.32-2.08)
Availability of Vitamin A supplementation				
No	16(7.5)	198(92.5)	1	
Yes	39(13.3)	254(86.7)	1.9(1.03-3.49)*	1.02(0.49-2.17)
Knowledge				
Adequate	5(2.7)	177(97.3)	1	
Inadequate	50(15.4)	275(84.6)	6.44(2.52-16.45)*	4.87(1.80-13.16)*

*significant at $p < 0.05$

Discussion

This cross sectional study aimed to assess knowledge and utilization of GMP, factor associated with utilization of GMP among under two children. The finding revealed that utilization was significantly associated with education status of the mother;

occupation of the mother, availability of weight measurement service for the child and mother's child feeding and growth monitoring knowledge.

Among mothers' participated in this study 64% of mothers had adequate child feeding and growth monitoring knowledge. This is slightly higher than

studies done in Areka, Southern Ethiopia, which found that 47% of the mothers have good knowledge growth monitoring (Biniam 2017). This is lower than a study finding from Nigeria that showed mothers' child feeding knowledge was 73.3% (Sanusi 2016). However, a study done in Ghana reported lower (32%) magnitude than this study finding (Gyampoh 2014). Similarly a study done in Upper West Region of Ghana revealed that 53% of the caregivers have good knowledge in GMP (Debra 2017). The difference could be due to the fact that the items included in the studies that were conducted in Nigeria and Ghana to assess knowledge might be different from the current study. Another qualitative study done in Nigeria reflected that majority of mothers believe that meat should not be feed to a child below two years (Christopher 2014). This is similar with the finding of the present study, which is more than half of the participants 63.4% gave incorrect answer regarding age that the child should be feed meat.

This study showed that utilization of GMP was 11%. On the other hand a study conducted in Southern Ethiopia revealed that utilization of GMP service was 17% (Fentaw 2017). This difference might be due to variations in operational definitions of GMP utilization used in the two studies. Similar study finding from Rwanda also showed GMP utilization of 76% (Ngirabega 2010). Higher report of GMP utilization in Rwanda from the two studies in Ethiopia might be attributed to the difference in the study design. This study used cross sectional design whereas the study from Rwanda used cohort design and the cohort includes children with GMP exposure. The other institution based study done in Ghana (Gyampoh 2014) showed that 26% of children had missed one or more GMP session. The study from Ghana was institution based while the present study was a community based. A study done in Kenya (Jane 2010) indicated higher proportion (53.3%) of GMP utilization than our study, which can be explained by the difference in population. Moreover, the study done in Kenya considered already identified utilizers of GMP while this study considers all children below two years in the study area.

Among the mothers' who participated in this study 20.4% didn't utilize GMP service because they think that their child is healthy. Moreover, 19% of the study participants didn't utilize GMP service because of work load they had. A qualitative study done in Tigray, Ethiopia also indicated that mothers' wrong belief and giving priority to other work than attending GMP session for GMP utilization (Selamawit 2014). There was a gap in understanding the aim of the GMP among mothers who participated in this study. Ten percent of the mothers participated in this study

mentioned thinking they just know if their children loss weight as a reason for not utilizing GMP service.

According to the 2016 Ethiopian Demographic and Health Survey report, the prevalence of stunting was 38%, underweight 24%, and wasting 10% (CSA 2016) which is still high. However, the government of Ethiopia is working on zero stunting in children less than two by 2030 (FMoH b 2016). Filling the gap and working on GMP could help to improve nutritional status of children and mothers' knowledge on child feeding.

This study showed that mother educational status was found to be predictor of utilization. It was found out that both mothers with elementary and secondary school and above level of education were three times more likely utilize GMP than mothers who are unable to read and write. A similar finding was reported from Afar, Ethiopia found that parent educational status is a factor affecting GMP utilization (Semhal 2021). Additionally, a study from Kenya (Jane 2010) which reported mothers with college level of education more likely utilize GMP than mothers who are unable to read and write. This may be attributed to mothers with formal education get the chance to utilize health service in addition to GMP than uneducated. Educated mothers can easily understand the benefit of utilizing GMP and other health services than uneducated mothers. However, the study conducted in Ghana (Gyampoh 2012) didn't show that mother education level influence GMP utilization.

Growth monitoring and promotion is one component of the community nutrition intervention. The GMP session is held in the community under big tree. Under such circumstances, farmer mothers had the opportunity to see experiences of other children-mothers pairs who utilize GMP service while farming. House wife mothers spend most of their time in the house and may not be exposed to this information.

Mother's child feeding and growth chart knowledge was also predictor of GMP utilization. Mother who had adequate knowledge of child feeding and growth chart more likely utilizes GMP than mother who had inadequate knowledge. This finding is similar with study done in Debre Birhan, Ethiopia (Ahmed 2020), Kenya (Jane 2010) and Ghana (Gyampoh 2014). This can be explained by mother with adequate child feeding knowledge and able to understand the information displayed on the growth chart get eager to utilize or attend GMP session.

Health service characteristics availability of weight measurement service for child in the health facility was significantly associated with utilization of GMP. Mothers who mentioned availability of weight

measurement service in the health facility are more likely to utilize GMP than those mothers' who mentioned unavailability of the service. Similar study finding from North Gondar of Ethiopia showed that availability of weight measurement tool in health facility is a factor for utilization of GMP (Melaku 2019). Immunization was predictor of GMP in other studies conducted in Ghana (Gyampoh 2012) and Kenya (Jane 2010). However, the present study rather showed that immunization was not associated with utilization of GMP. This might be due to difference on provision of GMP in the area covered by the present study. In Kenya and Ghana GMP is given in health facilities while mothers' children pairs visit health facilities to get immunization. In Ethiopia, GMP is rather community based and it isn't given with immunization.

Conclusions and recommendation

More than half of the study participants had adequate child feeding growth chart knowledge. However utilization of GMP is very low in Butajira, Ethiopia. Higher educational status, farmer occupation category, availability of weight measurement service and mothers with adequate child feeding and growth chart knowledge were associated with higher odds of GMP utilization. Growth monitoring and promotion should be implemented throughout the country to ensure the welling of children enabling early detection and intervention of nutritional problems.

Study limitation

There may be a recall bias while assessing the child feeding and growth chart knowledge of the mothers.

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