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Growth monitoring and promotion services utilization and associated factors among children less than two years of age in Digelu Tijo district, south central Ethiopia

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ABSTRACT

Background: Growth monitoring and promotion(GMP) appear to be a prerequisite for good child health. Thus, this study assessed GMP utilization and associated factors among children less than two years in rural communities of Digelu Tijo district, Ethiopia, 2018.

Method: We conducted a community-based cross-sectional study design to assess growth monitoring and promotion service utilization and its associated factors among children less than two years in rural communities of Digelu Tijo district, South Central Ethiopia. Multivariate logistic regression was used to determine the presence of statistically significant associations between the GMP utilization and independent variables at p-value <0.05 and Adjusted odds ratio (AOR) values with a 95% Confidence Interval(CI).

Results: The overall utilization of GMP service in the study area was 32.8%. Factors such as children aged 0–11 months old (AOR = 3.59, 95% CI: 2.42, 5.31), mothers/caregivers whoever used a family health card (AOR:2.65, 95% CI: 1.77,3.96), utilized postnatal care services (AOR:1.54, 95% CI: 1.03,2.31), visited health facilities only for GMP (AOR:2.23, 95% CI: 1.48, 3.36), and discussed on child growth with husband (AOR:3.29, 95% CI: 2.23, 4.83) were significantly associated with utilization of GMP service.

Conclusion: We found that overall GMP services utilization was low in the study area. GMP service utilization was found to be significantly associated with child age, visiting health facilities for GMP service only, and discussing child growth with husband. Thus, designing an intervention that promotes fathers' involvement and strengthens the families' discussion on child growth is needed to improve GMP service utilization.

1. Background

Child malnutrition is one of the world's public health issues holding back development with unacceptable human consequences and is linked with around half of deaths among children under 5 years of age.[1] The 2018 global report indicated that around 150.8 million children are stunted, 50.5 million are wasted and 38.3 million are overweight and 20 million babies are born of low birth weight each year.[2] Globally, around 10.5 million child deaths occur annually due to undernutrition, in which 98% of these mortalities are reported in developing countries.[3] In Ethiopia, though there are decline in the burden of undernutrition, 38%, 24%, and 10% of children under five were stunted, underweight, and wasted respectively.[4] The high burden of child malnutrition in developing countries has a huge impact on child growth and development.[5] Thus, practicing good Infant and young child feeding is critical for a child's growth and development.[6] Despite variations in economic status and health expenditure between countries, it is important to explore potential solutions to the double burden of malnutrition in developing

Abbreviations: ANC, Antenatal Care; AOR, Adjusted Odds Ratio; CC, Community Conversation; CI, Confidence Interval; COR, Crude Odds Ratio; FHC, Family Health Card; GM, Growth Monitoring; GMP, Growth Monitoring and Promotion; PNC, Post-natal Care; SPSS, Statistical Package for Social Science; SURE, Sustainable Under Nutrition Reduction in Ethiopia.

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countries and the obesity epidemic in high-income countries.[7] Thus, there is increasing recognition that early life strategies such as Growth monitoring and promotion should take into account to tackle malnutrition and mortality.[8] Growth monitoring and Promotion is the regular measuring, plotting, and interpretation of a child's growth to counsel or take action when abnormal growth is detected.[9,10] It is also a prevention activity comprised of Growth monitoring (GM) linked with a promotion that increases awareness about child growth; improves caring practices; and serves as the core activity in an integrated child health and nutrition program. As an intervention, it is designed to affect family-level decisions and individual child nutritional outcomes.[11,12] It also seeks to empower mothers to provide appropriate child care and improve the nutritional status of their children.[13,14] Where there is a public-private partnership to promote the GMP programs, it is possible to improve in child nutritional status and reduction in child malnutrition as well as mortality.[15,16] However, in most countries including Ethiopia, the GMP utilization rate was low and the growth chart is poorly understood by mothers.[17] For instance, the study conducted in Southern Ethiopia found that the Utilization of GMP services was 16.9%.[18] In addition, a study done in Butajira also found a low(11%) utilization of GMP(19). Besides this, the GMP services cannot easily be implemented and are affected by different Sociodemographic, economic, and knowledge-related factors.[20] A previous study found that mothers' illiteracy, family size, poor parental intention for GMP, misunderstanding of the chart by health workers, maternal knowledge and a lack of basic resources to keep and/or to buy healthful and nutritionally-rich food, method of child weighing and poor intention of mothers for the service as determinant of GMP utilization.[13,18,21,22] Although many efforts were made to improve childhood health and nutritional status through the provision of the GMP, there are limited studies on the utilization of GMP services and associated factors among children aged 0–23months in Ethiopia particularly in Digelu and Tijo district. Thus, determining the magnitude of GMP utilization may help to fill the information gap about the service uptake and identifying difficulties in GMP service provision in the study area. Therefore, this study was conducted to determine the proportion of GMP services utilization and associated factors among children under two years of age in Digelu Tijo district, Southern Central Ethiopia.

2. Methods and material

2.1. Study setting, and design

We conducted a community-based cross-sectional study in the Digelu Tijo district, South Central Ethiopia from July 15, to August 20, 2018. Digelu Tijo district is located 198 kilometers far from Addis Ababa and 23 kilometers from the Zonal town Asella. The district had a total of 23 Kebele(the smallest administrative unit), 5 health centers, and 23 health posts. The total number of children 0–23 month's age residing in the rural areas of the district was 9445. According to the population projection of Ethiopia, the district had a total population size of 190,138 (male 93,168 and females 96,970), of which, 165,420 were rural residents.

2.2. Study population

All rural mothers who had 0–23 months children and live in the Digelu Tijo district were considered as source populations while mother who have children aged 0–23 months in selected kebele were the study populations. All mothers having children less than two years old and lived at least for six months before data collection in the study area were included in the study. Critically sick mothers/caregivers who can't respond to the questions, and those emigrants (i.e. migrated from their living area in the summer), and relative visitors during data collection were excluded from the study.

2.3. Sample size and sampling procedure

We calculated a sample size of 1042 using a single population proportion formula, taking P = 16.9%,[18] 95% confidence level, marginal error of 5%, design effect of 2, and an anticipated non-response rate of 10%. We used a multi-stage sampling technique to select participating mothers. Twelve kebele of the district were selected using simple random sampling from 23 kebele. We prepared the sampling frame containing a list of mother/caregivers with children less than 2 years old along with their date of birth and house number obtained from the community health information system and respective Kebele. The sample was allocated proportionally to each kebele based on their respective mothers number. Finally, we used a systematic random sampling method to access the participants. If twin children were found for the selected mothers, only one child was chosen by the lottery method. We identified the first mothers by simple random sampling using the lottery method.

2.3.1. Data collection procedure and quality management

We used a semi-structured interviewer-administered questionnaire prepared by reviewing previous literature.[18,19,23] The questionnaire was first prepared in English and translated to the local language (i.e. Afan Oromo) by an experienced translator and back-translated to English by an independent translator for consistency. Before the actual data collection, the questionnaire was pretested on 5% of the total sample size in the Tite Waji and Digelu Kidame kebele, and some modifications were made accordingly. Data was collected by six trained health professionals who had a qualification of at least a college diploma in health fields and were proficient in the local language. Two health professionals supervised and monitored the overall data collection processes. Collected data were checked for completeness and consistency on daily basis.

2.3.2. Variables of the study

Growth monitoring and promotion services utilization was the dependent variable, whereas various factors such as; socio-demographic and economic-related factors (caregiver's age, sex, religion, ethnicity, marital status, caregiver relation to child, child age, sex, monthly income, occupation, educational status), maternal health services, child health services, knowledge and attitude about GMP, Media availability, and accessibility of health facilities were the independent variables.

2.3.3. Operational definitions

Caretaker: any other adult who is taking care of children and ensuring their wellbeing.

Utilization of GMP services: Participation of the mother in the GMP services at least once for her 0 month-old child, at least two times for her child 1–3 months old, at least five times for her child 4–11 months, and at least four times per year for her child 12–23 months old and plotted or recorded on the child's growth chart.[18]

Knowledge of GMP services: Knowledge of mothers towards GMP service utilization was assessed using ten knowledge questions. Each correct answer was given a score of 1, and incorrect answers were given a score of 0. The total score ranges from 0 to 10 and a score above 7 was categorized as good knowledge and below 7 was categorized as poor knowledge.[23]

Attitude toward GMP services: Mothers' attitude towards the GMP services was assessed using eight attitude questions. Mothers who have supported the utilization of GMP services and answered four and above items out of eight questions considered to have a good attitude towards the GMP service.

2.3.4. Data processing and analysis

The collected data were coded and entered into Epi-Info 7 and exported to Statistical Package for Social Science (SPSS) version 21 for analysis. We calculated descriptive statistics for categorical variables

and presented them in form of tables and frequencies. We performed multivariate logistic regression analysis to identify factors associated with Growth monitoring and promotion services utilization. All variables with a P-value less than or equal to 0.25 in the bivariate logistic regression analysis were entered into the multivariate model. A p-value of less than or equal to 0.05 and an AOR with 95% CI were used to declare the statistical significance of the outcome variable.

2.3.5. Ethical considerations

Ethical approval was obtained from the Institutional review board of Arsi University, College of Health Science before the initiation of the study. We secured data collection permission from Digelu and Tijo District Health Office. Written consent was obtained from every respondent after the purpose of this study were explained. To safeguard the confidentiality of information, unique codes were provided on the questionnaire during the data collection. Nineteen children who were found with anthropometric measurements less than 11 cm were referred to their kebele health extension workers for treatment.

3. Results

3.1. Socio-demographic characteristics of the study participants

Out of 1042 study participants, a total of 965 mothers/caregivers participated in the study, yielding a response rate of 92.6%. In this study, almost greater than half,492(51%) of the children were in the age group of 12–23 months and more than half of the children (566, 58.7%) of them were females. Regarding the age of the study participants, 424 (43.9%) of them were in 25–29 years of age category. More than three fourth of the respondents (750, 77.7%) attended primary education while 143(14.8%) attended secondary and above education. More than two-fifth (413, 42.8%) of the study participants had a monthly income ranging from 1000 to 1999 birr(Table 1).

3.2. Healthcare service utilization-related characteristics of mothers/caregivers

Out of 901 mothers who get Antenatal care services, 578 (64.2%) had Antenatal Care(ANC) follow-ups with a frequency of four or more visits. The majority (85.5%) of the mothers were delivered at health institutions, whereas more than two fifth (411, 42.6%) of the mothers had utilized Postnatal Care(PNC) services. The majority(52.6%) of mothers/caregivers were counseled on nutrition while 512(53.1%) of them received vitamin A supplementation(Table 2).

3.3. Utilization of growth monitoring and promotion services

This study revealed that 317(32.8%) of children utilized GMP services in the study area (Table 2). Among 648(42%) of respondents who didn't utilize GMP services said that Health workers were not available on the working days to serve us(Fig. 2). The study revealed that 291 (28.1%) of participants said that there is a Community conversation (CC) about GMP services in their village, among which ninety-four caregivers participated in community conversation regularly. More than half (170, 58.4%) of the study participants reported that the community conversation on GMP services was useful(Table 3). Regarding the benefits of GMP, around 38.46% of the study participants said that the GMP service is useful for getting child nutritional counseling from health workers (Fig. 1).

3.4. Factors associated with growth monitoring and promoting services utilization

In bivariate logistic regression, variables such as child age, child sex, birthplace, caregiver education level, monthly income, attitude and knowledge of GMP, presence of community conversation, participation

Table 1
Socio-demographic characteristics of the study participants in Digelu Tijo District, South Central Ethiopia, 2018 (n = 965).

Variables		Frequency
Child age	0–11	473(49.0)
	12–23	492(51.0)
Child Sex	Male	399(41.3)
	Female	566(58.7)
MUAC	<11	20(2.0)
	11–11.9	72(7.5)
	≥12	873(90.5)
Caregiver age	20–24	137(14.2)
	25–29	424(43.9)
	30–34	316(32.7)
	35–39	73(7.6)
	40–44	15(1.6)
Religion	Orthodox	357(37.0)
	Muslim	541(56.1)
	Protestant	67(6.9)
Ethnicity	Oromo	934(96.8)
	Amhara	31(3.2)
Level of Education of Caregiver	No Education	72(7.5)
	Primary	750(77.7)
	Secondary 9-10	101(10.5)
	High School 11-12	14(1.4)
	Technical/ Collage	28(2.9)
Occupation of Caregiver	House Wife	914(94.7)
	Merchant	51(5.3)
Occupation of Husband	Farmer	882(91.4)
	GO, Employee	34(3.5)
	Self-Employment	30(3.1)
	Others	19(2.0)
Marital Status	Married	952(98.7)
	Widowed	13(1.3)
Relationship with Child	Mother	945(97.9)
	Grandmother	20(2.1)
Number of children Less than 24 months in the Family	1	928(96.2)
	2	37(3.8)
Monthly Income	500	98(10.2)
	500–999	268(27.8)
	1000–1999	413(42.8)
	2000–4999	158(16.4)
	≥5000	28(2.9)

Table 2
Healthcare service utilization-related characteristics of mothers/caregivers in Digelu Tijo district, South Central Ethiopia, 2018 (n = 965).

Variables	Category	Frequency (%)
ANC services	Yes	901(93.4)
	No	64(6.6)
Frequency of ANC follow-up	<4 visits	323(35.8)
	≥4 visits	578(64.2)
PNC services	Yes	411(42.6)
	No	554(57.4)
Place of delivery	Health institution	825(85.5)
	Home	140(14.5)
Vaccination status of the child	Fully vaccinated	612(63.4)
	Vaccinating	342(35.5)
	Not vaccinated	11(1.1)
Counseled on nutrition	Yes	508(52.6)
	No	457(47.4)
Vitamin A supplementation	Yes	512(53.1)
	No	453(46.9)
In time	≤30 min	596(61.8)
	>30 min	340(38.2)
GMP utilization	Utilized	317(32.8)
	Not utilized	648(67.2)
Purposely for GMP	Yes	546(56.6)
	No	419(43.4)
Ever used a family health card	Yes	417(43.2)
	No	548(56.8)

Table 3
Community conversation for mothers/caregivers with children 0–23 months in Digelu Tijo district, Southern Central Ethiopia, 2018.

Variables	Category	Frequency (%)
Community conversation on utilization of GMP services	Yes	291(30.2)
	No	674(69.8)
Participation of mothers in community conversation	Yes	283(97.3)
	No	8(2.7)
Community conversation frequency on GMP	Regular	94(32.3)
	Irregular	197(67.7)
Nutrition and health learning materials during community conversation of GMP	Family health card	262(90.0)
	Nutrition and healthy leaflet	29(10.0)
Community conversation useful	Yes	170(58.4)
	No	121(41.6)
Discuss on child growth with husband	Yes	354(36.7)
	No	611(63.3)

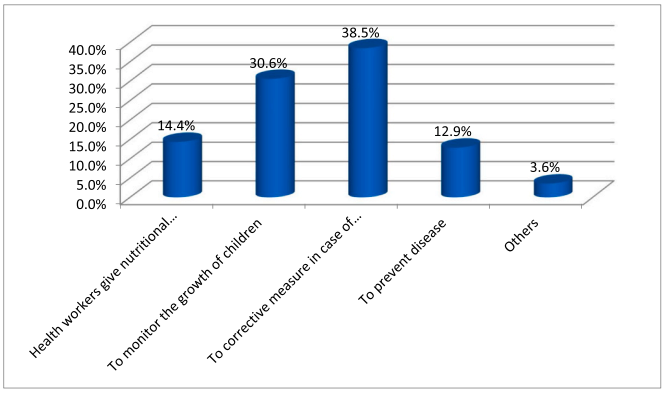

Fig. 1. Reported benefits of GMP in the rural community of Digelu Tijo Woreda, Ethiopia, 2018.

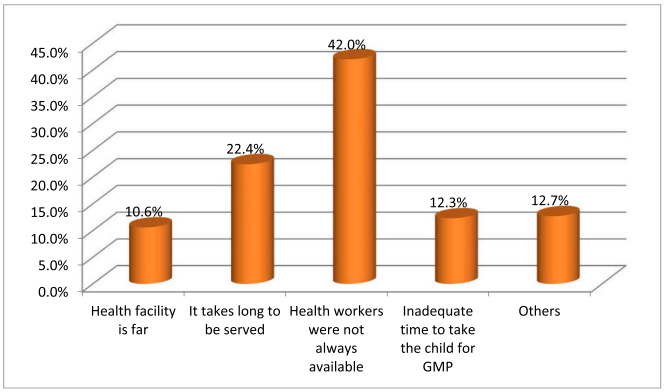

Fig. 2. Challenges for utilizing GMP in the rural community of Digelu Tijo Woreda, Ethiopia, 2018.

in CC, frequency of CC, caregivers utilization of ANC, and PNC services, visit health facilities for GMP service, discussing with husband about child growth and family health card utilization were associated with the dependent variable. However, in the multivariable logistic regression analysis, we found child age, mother who utilized family health card and PNC service; visited health facilities only for GMP services, and discussed child growth with her husband were significantly associated with utilization of GMP. This study indicated that those respondents who had a child aged 0–11 months old were almost 4 times more likely to utilize GMP than their counterparts[AOR = 3.59; 95% CI, 2.42, 5.31]. Households who utilized family health cards(FHC) were 2.65 times more likely to utilize GMP than their counterparts [AOR = 2.65; 95% CI, 1.77, 3.96]. Respondents who utilized PNC services were almost 2 times more likely to utilize GMP than those who didn't utilize PNC services [AOR = 1.54; 95% CI, 1.03, 2.31]. The odds of utilizing GMP services were 2.28 times higher among those who visited health facilities only for GMP services than their counterparts [AOR = 2.28; 95% CI, 1.48, 3.36]. We found that caregivers/mothers who had a discussion on child growth with their husbands were 3.29 times more likely to utilize GMP than those who had no discussion with their husbands about child growth [AOR = 3.29; 95% CI, 2.23, 4.83](Table 4).

4. Discussion

Child malnutrition is one of the world's public health problems and is linked with around half of deaths among children under 5 years of age.[1] This can be prevented through regular monitoring of the growth and development of children and the implementation of GMP services.[21] Thus, this study aimed to determine factors associated with GMP service utilization among children less than two years of age in Digelu Tijo district, South Central Ethiopia. In this study, the overall magnitude of the utilization of GMP services was 32.8%. The finding of this study is higher compared to a study conducted in Nyanza Province, 25%,[24] Thika, Kenya, 20%,[25] Mareka, Ethiopia, 16.9%,[18] and Butajira, Ethiopia, 11%.[19] However, the finding of this study is less than the study done in South Africa, 67%,[26] Kenya, 53.3%,[27] Nairobi, Kenya,58.1%,[28] Ghana, 70%,[29] Uganda (52.5%),[30] Dominican Republic 85%[31] and Gondar zone, 50.4%.[32] The discrepancy might be due to the fact that HEWs are making home-to-home visits on regular basis to support families in accessing basic health services; the district has been also supported by the SURE program which targeted under two children and gave home to home-based health education and promotion services. Also, the differences might be due to variation in the educational status, sample sizes, study areas, and distances of health facilities from the community.

This study revealed that those respondents who had a child aged 0–11 months were more likely to utilize GMP than their counterparts. This indicates child age was negatively associated with the utilization of GMP services. However, this study contradicts with the study done in Southern Ethiopia[18] that found the age of the child was positively associated with the utilization of the GMP service. But, our finding was supported by a study from Kenya[28] and Ghana.[13] This variation might be due to the majority (51%)of caregivers in this study had a child aged

Table 4
Multivariate logistic regression of GMP utilization and associated factors among children less than two years in Digelu Tijo district, South central Ethiopia, 2018.

Variables	Category	GMP service		COR(95% CI)	AOR (95% CI)
		Utilized	No utilized		
Child age (in month)	0–11	197 (41.6)	276 (58.4)	2.21 (1.68,2.92)	3.59 (2.42,5.31)
	12–23	120 (24.4)	372 (75.6)	1	1
Ever Used FHC	Yes	231 (55.4)	186 (44.6)	6.67 (4.94,9.01)	2.65 (1.77,3.96)
	No	86 (15.7)	462 (84.3)	1	1
PNC services	Yes	197 (47.9)	214 (52.1)	3.33 (2.52,4.41)	1.54(1.03, 2.31)
	No	120 (21.7)	434 (78.3)	1	1
Visit HF only for GMP	Yes	239 (43.8)	307 (56.2)	3.40 (2.53,4.59)	2.23(1.48, 3.36)
	No	78 (18.6)	341 (81.4)	1	1
Discuss With Husband	Yes	203 (57.3)	151 (42.7)	5.86 (4.37,7.86)	3.29(2.23, 4.83)
	No	114 (18.7)	497 (81.3)	1	1

12–23 months and those who had a child aged 0–11 months frequently visit health facilities for immunization which helps them to easily access and utilize the GMP services. We found that the odds of utilizing the GMP services were higher among caregivers who used family health cards than their counterparts. This finding was supported by a study conducted in Kenya[27] and the Gondar zone.[32] Moreover, the study also identified caregivers who utilized PNC services were more likely to utilize GMP services than those who didn't utilize PNC services. This might be explained by mothers who visited PNC services were counseled on their child's feeding and health status as part of the PNC service.

We found the odds of utilizing GMP services were higher among caregivers who visited health facilities purposely for GMP services as compared to those who sought services together with other health services. This finding contradicts with finding from Kiambu, Kenya[18] and is supported by a report from a study conducted in Ethiopia.[18] This might be explained by those caregivers who visited health facilities for GMP services only getting full advice about the benefits of utilizing the GMP services for their child while those who attended with other services might get little awareness as a result of health providers' workload. Those mothers/caregivers who discussed their child's growth with their husbands were more likely to utilize GMP services than those who had no discussion. This could be because families who discuss their child's growth with each other had increased awareness about the benefits of utilizing the GMP services and are more likely to assist each other and don't suffer from a lack of financial support during attending the GMP services. Even though our study had a satisfactory response rate, it has certain drawbacks. First, it was a cross-sectional study so that the temporal cause-effect relationships could not be assessed. Second, the study used the quantitative method only and it was better if the qualitative part was used together with the quantitative part to find the determinants. Third, this study did not include the urban population, which might affect the generalizability of this study's finding.

5. Conclusion

We found the overall magnitude of growth monitoring and promotion services utilization was low in the study area. Child age, mothers/caregivers who used a FHC, utilized PNC services, visited health facilities only for GMP services, and discussed child growth with their husbands were significantly associated with GMP service utilization. Thus, designing an intervention that promotes the fathers' involvement and strengthens the families' discussion on child growth is needed to improve GMP service utilization.

Consent for publication

NA.

Availability of data and materials

The dataset used or analyzed during this study were available from the corresponding author on reasonable request.

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Author's contribution

AWK, DG, YK, and MK designed and worked on the study protocols. YK, MK, DG and AWK prepared a data collection tool and provided training to data collectors. AWK, DG, DT, and MK conducted data entry to SPPS. AWK, DT, and DG analyzed the data, interpreted the result, and wrote the manuscript's draft and final version. All authors read and approved the final manuscript.

Declaration of competing interest

The authors declare that they have no competing interests.

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