

## Original Research Article

# Caregiver knowledge and perceptions as determinants of growth monitoring and promotion service utilization in Kisumu County

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## ABSTRACT

**Background:** Growth monitoring and promotion (GMP) is globally recognized for its role in early detection of growth faltering and providing timely nutrition and health interventions. Despite its benefits, utilization remains suboptimal in many low- and middle-income countries. In Kisumu County, Kenya, evidence suggests that caregiver-related factors, particularly knowledge and perceptions, significantly influence GMP service uptake. Using cross-sectional data from caregivers of children under five years, the study examines associations between caregiver understanding of GMP objectives, perceived benefits and attendance patterns.

**Methods:** This was a community-based descriptive cross-sectional study design. Data was collected through a structured questionnaire from a sample of 407 caregivers who participated in the survey. Study participants were identified through a multistage sampling method. Both descriptive and multivariable logistic regression analyses were performed. An adjusted odds ratio (aOR) (95% CI) was used to assess the strength of association.

**Results:** The median (IQR) age of caregivers was 28 (22, 34) years and the under-5s was 27 (17, 40) months. Most caregivers (91.2%) had good knowledge of GMP and 84.0% had a positive perception of the services. Caregivers with good knowledge on GMP services (aOR=5.01; 95%CI=1.67-15.05); Caregiver with good perception (aOR=4.96, 95%CI=2.20-11.17).

**Conclusions:** Caregiver knowledge and perception significantly influence GMP uptake. Tailored health education and enhanced service quality are necessary to improve attendance and ultimately child health outcomes.

**Keywords:** Caregiver knowledge, Growth monitoring and promotion, Kisumu, Kenya, Perception, Service utilization

## INTRODUCTION

GMP is a high-impact primary public health intervention for tracking growth trajectory of children who are aged between 0 to 59 months, by routinely measuring size of the child's (weight, height/length and head

circumference) to record the growth in contrast to a standard periodic anthropometric measurement providing timely nutritional counseling and detecting early signs of growth faltering before they escalate into severe malnutrition.<sup>1</sup> The World Health Organization (WHO) recommends GMP as an essential child survival strategy, particularly in low- and middle-income countries

(LMICs), where the burden of malnutrition remains high.<sup>1</sup> A global child malnutrition survey in 2020 showed that there were 144 million children who were stunted, 47 million who were wasted and 14.3 million who suffered from severe wasting.<sup>2</sup> Most children with malnutrition live in Africa and Asia. Regionally, sub-Saharan Africa continues to experience significant challenges in achieving optimal child growth outcomes, despite substantial investments in maternal and child health programs.<sup>3</sup>

Several factors i.e., cultural, socio-economic and health system factors influence GMP participation in this region. Studies conducted in countries such as Ethiopia, Uganda and Tanzania have shown that caregiver knowledge on GMP and perception of service quality are critical determinants of regular GMP attendance.

Implementing the GMP program in many lower and middle-income countries has enhanced the diagnosis and monitoring of early-stage child growth issues through nutrition counselling and health-promoting actions. Despite its benefits, GMP participation rates among child caregivers remain suboptimal in low- and middle-income countries (LMICs). In Kenya, the national GMP service utilization stands at approximately 40%.<sup>4</sup> This low uptake undermines the potential benefits of GMP.<sup>1,4,5</sup> Understanding the caregiver utilization of GMP could help in strengthening its implementation and coverage.

In Kenya, GMP is integrated into the national child health strategy which is delivered through both facility-based and community health platforms. A report by the Kenya Demographic and Health Survey (KDHS) 2022, indicates that while child health service coverage has improved, disparities persist in rural counties<sup>6</sup> Kisumu County, where Nyakach Sub-County is situated, shows locally comparable issues with stunting rates higher than the national average.<sup>7</sup> In Nyakach Sub-County, low GMP attendance has been reported despite the availability of GMP services, raising concerns about the role of caregiver-related factors in influencing GMP services uptake.

Local studies done previously have primarily focused on structural barriers to GMP, such as accessibility to include distance to health facilities, availability of health care workers and supply chain issues. However, there is limited empirical evidence on how caregiver knowledge and perceptions affect GMP utilization in rural Kenyan settings. Understanding these behavioral determinants is essential for designing interventions that not only increase attendance but also improve the quality and outcomes of GMP services.

This study, therefore, assessed the link between caregiver knowledge on GMP services and perceptions and the utilization of GMP services among caregivers of children aged 0–59 months in Nyakach Sub-County, Kisumu County, Kenya.

## METHODS

### *Study design and site*

The study was a community-based which employed a cross-sectional descriptive study design. Quantitative approach was used in data collection. The study aimed to establish caregiver knowledge and perceptions as determinants of growth monitoring and promotion (GMP) service utilization in Kisumu County and the study period was from July 2023 to October 2024. This was conducted in Nyakach sub-county, in Kisumu County, Kenya. Nyakach Sub-County lies between the latitude 0000' (the equator) and 00 25'South and between longitude 340 45' east and 350 21' west. Nyakach Sub- County covers an area of 358.6 km<sup>2</sup> including approximately 71 km<sup>2</sup> of the lake water surface with a total of five wards.

### *Study population*

The study population were the children aged 0 to 59 months in Nyakach Sub-County, regardless of whether they had previously utilized or participated in Growth Monitoring and Promotion (GMP) services.

### *Sample size*

The sample size for this study was derived using Cochran's Formula,  $n = z^2pq/d^2$  substituting this we get a sample size of 384. Finally, an allowance of a 6% non-response rate was added to the final sample size to reach 407 caregivers as the desired sample size.

### *Sampling criteria*

Sampling was multi-stage. Nyakach Sub-County was purposively selected as the study area due to the limited availability of localized evidence on GMP services utilization and the need to generate context-specific insights to inform targeted interventions and guide health policy and programming within Kisumu County.

Of the five wards of Nyakach Sub-County, North Nyakach and South East Nyakach were purposively chosen for the study based on their relatively high population size, both in terms of general population and the number of under-fives compared to other Wards in Nyakach Sub-County (i.e., South West Nyakach, Central Nyakach and West Nyakach), making them ideal settings for capturing a sufficient number of eligible caregivers with power to detect significant differences of  $<0.05$  while also reflecting the broader patterns of GMP services utilization in the Sub-County. Households with eligible children were identified in the two wards based on a household list. Community Health Units were mapped and the Community Health Promoters assisted in developing a list of all households with children aged 0–59 months. From the list  $N=6510$ , households were selected using a simple random sampling technique to

ensure that every household had an equal chance of being included in the study.

**Data collection methods and procedure**

The study employed in-person surveys to collect primary data from caregivers with children 0 to 59 months of age by use of a researcher-administered questionnaire. The questionnaire had both closed and open-ended questions.

Community health promoters were recruited for the data collection process, they were trained before they began data collection. The training involved enlightening them about the study protocol, how to use the collection tool and adherence to ethical conduct. The data collected was entered in Microsoft Excel in a password secured computer, cleaned and exported to SPSS version 27 for analysis.

**Data analysis**

Data analysis began from the field whereby the questionnaires were reviewed as they came and any errors were corrected while the researcher was still in the field. Manual cleaning of the information was done before data was entered into the computer. Data was then entered into the computer using Statistical Package for Social Science (SPSS version 26). Data cleaning was done before analysis. Data was analyzed and descriptive Statistics were used to measure frequency and interval of visits for GMP services by caregivers, to determine GMP services components provided to caregivers’ during GMP visits, to assess caregivers’ knowledge on GMP services and perception towards GMP services and the results was presented using texts, tables and graphs.

To determine the factors that influence children between the ages of 0-59 months to utilize GMP services, a binary logistic regression model was fitted. Consequently,

variables exhibiting a p value of less than 0.05 in the bivariate analysis were entered into and model using multivariable logistic regression. Intervening variables were included as covariates in the multivariable logistic regression model alongside the primary independent and dependent variables. The multivariate analysis classified variables as statistically significant if their p value was less than 0.05. The degree and existence of a relationship between the use of GMP services and its determinants was assessed by computing both crude and adjusted odds ratios along with the corresponding 95% confidence interval.

**Ethical consideration**

Ethical approval was obtained from the board of postgraduate studies at Jaramogi Oginga Odinga University of Science and Technology (JOUST), JOUST ethical review committee, the National Commission for Science, Technology & Innovation (NACOSTI/P/23/30138) and Kisumu County department of health and sanitation authorized the study implementation. Participants were recruited voluntarily and confidentiality of the information was safeguarded by removing any identifiers.

**RESULTS**

**Socio-demographic characteristics of the respondents**

A total of 407 caregivers of children aged 0-59 months in Nyakach Sub-County participated in this study with 100% response rate. The results in table 1 show that median (IQR) of the children was 27 (17, 40) months and almost half (50.4%) of them were female. More than three-quarter (82.1%) of the caregivers were married and about half (53.1%) had at most primary level of education. More than half (58.4%) of the caregivers were unemployed/housewife.

**Table 1: Factors determining GMP utilization for children 0-59 months among caregivers.**

Variables	Utilization of GMP		Bivariate analysis	Multivariate analysis	P value
	Yes, N (%)	No, N (%)	COR (95% CI)	AOR (95% CI)	
<b>Age of the child (in months)</b>					
0-11	44 (83.0)	9 (17.0)	53.45 (15.91-179.55)	121.01 (27.91-524.58)	<0.001*
12-23	64 (64.7)	35 (35.3)	12.25 (5.54-27.09)	22.42 (8.44-59.52)	<0.001*
24-35	51 (42.9)	68 (57.1)	4.59 (2.17-9.69)	6.64 (2.72-16.18)	<0.001*
36-47	18 (23.4)	59 (76.6)	1.53 (0.67-3.51)	1.45 (0.57-3.70)	0.440
48-59	9 (15.2)	50 (84.8)	1.00	1.00	0.239
<b>Gender of the child</b>					
Male	94 (46.5)	108 (53.5)	1.00	1.00	
Female	92 (44.9)	113 (55.1)	0.94 (0.63-1.38)	1.12 (0.66-1.89)	0.681
<b>Marital status</b>					
Married	147 (44.0)	187 (56.0)	0.69 (0.14-1.13)	1.05 (0.51-2.19)	0.888
Single/Separated/Widowed	39 (53.4)	34 (46.6)	1.00	1.00	
<b>Caregiver’s level of education</b>					
Primary/None	82 (38.0)	134 (62.0)	1.00		
Secondary/Tertiary	104 (54.4)	87 (45.6)	1.95 (1.32-2.90)	1.61 (0.93-2.78)	0.087

Continued.

Variables	Utilization of GMP		Bivariate analysis	Multivariate analysis	
<b>Employment status</b>					
No employment	112 (46.1)	131 (53.9)	1.00	1.00	
Employed	74 (45.1)	90 (54.9)	0.96 (0.65-1.43)	1.92 (1.08-3.42)	0.026*
<b>Maternal knowledge on GMP</b>					
Poor knowledge	5 (13.9)	31 (86.1)	1.00	1.00	
Good knowledge	181 (48.8)	190 (51.2)	5.91 (2.25-15.52)	5.01 (1.67-15.05)	0.004*
<b>Caregiver's perception</b>					
Bad perception	15 (23.1)	50 (76.9)	1.00	1.00	
Good perception	171 (50.0)	171 (50.0)	3.33 (1.80-6.16)	4.96 (2.20-11.17)	<0.001*

COR: Crude odds ratio; AOR: adjusted odds ratio; CI: confidence interval; GMP: growth monitoring promotion. \*A p value of less than 0.05 was considered significant.

### Caregivers' perception towards GMP services

Perception was measured based on a five-point Likert scale. Participants who scored 15-20 points were considered to have a good perception towards GMP activities; those who scored less than 15 points to have bad perception towards GMP activities.

Majority (84.0%) of the caregivers had good perception towards GMP services for children under 60 months. Though there was good perception towards GMP services, 2.7% of the caregivers disliked the feeling towards attending the clinic for GMP services, 2.7% were finding difficulties in seeking early health care, about 0.9% were getting poor health GMP services and some 0.5% would not recommend the GMP services to another caregiver.

In Table 1, both bivariate and multivariate logistic regression analyses were done at 5% level of significance. For bivariate analysis; caregiver's knowledge on GMP, caregiver's perception towards GMP services were found to be statistically significant factors determining utilization of GMP services.

In multivariate analysis, the odds of GMP utilization were found to be significantly higher among caregivers who had good knowledge on GMP services (aOR=5.01, 95% CI=1.67-15.05, p value=0.004) and those who had good perception about GMP (aOR=4.96, 95% CI=2.20-11.17, p value<0.001).

## DISCUSSION

Globally, GMP is recognized as a pillar of child health and nutrition interventions, serving as an early detection mechanism for growth faltering and a platform for targeted health education.<sup>1</sup> Despite widespread implementation of GMP, studies from various low- and middle-income countries show that gaps in caregiver knowledge and inconsistent attendance patterns remain barriers to achieving the full potential of GMP in improving child outcomes.<sup>8</sup>

Regionally, sub-Saharan Africa experience significant challenges in achieving positive child growth outcomes, despite substantial investments in maternal and child health programs.<sup>9</sup> Insufficient caregiver knowledge on GMP is identified as a key barrier in several countries, including, Tanzania, Uganda and Ethiopia, leading to irregular attendance and drop out of GMP services.<sup>10,11</sup> In many occasions, caregivers often stop attending GMP sessions after completion of routine immunization schedule, which often leads to missing opportunities for continuous growth monitoring and nutrition counseling. Nationally, Kenya has made progressive efforts in strengthening community health services, including the integration of GMP services into maternal and child health services and the use of Community Health Promoters (CHPs) to mobilize caregivers and conduct assessments.<sup>12</sup> According to Kenya Demographic and Health Survey reported that 94% of caregivers recognized the importance of regular growth monitoring for children under five years, but also highlighted that GMP attendance dropped sharply after children turned two years, this suggests predominant knowledge and perception gaps.<sup>6</sup> Locally, findings from this study in Nyakach Sub-County indicate that caregivers with good knowledge of GMP had higher odds of utilizing GMP services. This finding is consistent with other studies and which showed that mothers who used GMP services more frequently were those with comparatively higher knowledge about GMP.<sup>13-15</sup>

Research conducted in Kenya indicated that caregivers were more likely to adhere to recommended breastfeeding and supplemental feeding standards if they had a better understanding of child nutrition.<sup>16,17</sup> However, despite the evident awareness and understanding of GMP services, the study also identified notable patterns in caregivers' behaviour regarding the continuation of GMP visits. It was observed that 47.4% discontinued these visits. This behaviour aligns with findings by Baraki et al and suggests the presence of underlying factors influencing caregivers' decision-making processes regarding the sustained use of GMP services.<sup>13</sup> The likelihood of using GMP services was higher among caregivers who had a positive perception of GMP services. This observation is supported by a study conducted in Northern Ethiopia

possible justification for this can be caregivers who are knowledgeable about GMP are better equipped to make informed decisions regarding their child's health and well-being.<sup>15,18</sup> They understand the importance of regular growth monitoring in assessing their child's development, detecting potential health issues early and taking appropriate actions to address them. This understanding likely motivates them to seek GMP services regularly. Caregivers with limited knowledge of GMP services, on the other hand, may encounter challenges to utilization and caregivers with positive perception influences behavior change, including the attendance of GMP sessions and negative perception are linked to non-attendance of GMP sessions

Caregiver perception emerged as a significant determinant of GMP utilization in this study. Caregivers with a positive perception of GMP services were nearly five times more likely to utilize GMP services compared to those with negative perceptions.<sup>19</sup> This finding underscores the critical role that attitudes and beliefs play in health-seeking behavior. Positive perceptions may come from caregivers recognizing the benefits of regular growth monitoring, trusting healthcare providers and having prior positive experiences with GMP services.

Conversely, negative perceptions potentially influenced by long waiting times, inadequate service delivery or misconceptions about the necessity of continued GMP visits beyond infancy may discourage caregivers from attending. These findings align with studies in Northern Ethiopia and Ghana, which found that caregivers with favorable attitudes were significantly more likely to adhere to GMP schedules.<sup>13</sup> Additionally, studies by Debuo et al and Harris et al, found a strong relationship between caregiver perception and adherence to GMP services, highlighting the importance of community engagement and education in sustaining positive attitudes.<sup>15,18</sup> Strengthening health promotion efforts and addressing service delivery gaps can improve caregiver perceptions and ultimately enhance GMP utilization.

### Limitations

There is a range of factors that may influence the practice of continued GMP over time. This information was not captured in this study because it was cross-sectional in nature. There was lack of adequate information regarding GMP practices in the study area.

### CONCLUSION

Caregivers with good knowledge and a positive perception in Nyakach were more likely to utilize GMP services, small but critical knowledge gaps persist. Strengthening targeted health education, particularly for caregivers at risk of discontinuing GMP attendance, could improve service utilization and contribute to optimal child growth outcomes. These findings rallies the importance

of enhanced community health education and engagement strategies within GMP programs.

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