Original Paper

Maternal Knowledge and Beliefs About Child Growth Monitoring and Promotion Program Based on the Health Belief Model and Its Relationship With Child Growth Parameters

Raziye Tahmasebi[1], Fatemeh Najafi Sharjabad[2], Maryam Seyedtabib[3], Marzieh Araban[4], Kambiz Ahmadi Angali[5,6], Fatemeh Borazjani[7,8*]

1. Nutrition (MSc), Nutrition and Metabolic Diseases Research Center and Clinical Sciences Research Institute, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
2. Assistant Professor, Department of Public Health, Bushehr University of Medical Sciences, Bushehr, Iran.
3. Assistant Professor, Department of Biostatistics, School of Health Sciences, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
4. Associate Professor, Department of Health Education and Promotion, Ahvaz Jundishapur University of Medical Sciences, Ahwaz, Iran.
5. Associate Professor, Department of Biostatistics, School of Health Sciences, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
6. Social Determinants of Health Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
7. Assistant Professor, Department of Nutrition, Faculty of Allied Sciences, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
8. Nutrition and Metabolic Disease Research Center, and Clinical Sciences Research Institute, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

Use your device to scan and read the article online

Citation Tahmasebi R, Najafi Sharjabad F, Seyedtabib M, Araban M, Ahmadi Angali K, Borazjani F. Maternal Knowledge and Beliefs About Child Growth Monitoring and Promotion Program Based on the Health Belief Model and Its Relationship With Child Growth Parameters. J Holist Nurs Midwifery. 2022; 32(3):210-218. https://doi.org/10.32598/jhnm.32.3.2233

Running Title Maternal Knowledge and Beliefs about Child Growth Monitoring

https://doi.org/10.32598/jhnm.32.3.2233

Article info:
Received: 26/04/2021
Accepted: 7/03/2022
Available Online: 01/07/2022

Keywords:
Child Growth Monitoring and Promotion, Anthropometry, Health Belief Model.

ABSTRACT

Introduction: The efficacy of Growth Monitoring and Promotion (GMP) program depends on active participation. However, its low acceptance by mothers is believed to reduce their participation in the program.

Objective: This study aims to assess maternal beliefs and knowledge about GMP and examine its association with the child growth parameters.

Materials and Methods: This cross-sectional study was conducted on 470 mother-child dyads who were recruited from public health centers of Ahvaz and Bushehr cities from August 2018 to February 2019 using a convenient sampling method. A questionnaire surveying anthropometric and socio-demographic characteristics as well as maternal knowledge and beliefs based on the Health Belief Model (HBM) was used to gather data. Child growth parameters were obtained from their medical records. Multinomial logistic regression was applied to determine the predictors of child growth parameters from among the HBM domains.

Results: The mothers had a mean age of 29.56±5.10 years, and 92% had a planned pregnancy. Favorable growth percentage based on parameters of length-for-age, weight-for-age, weight-for-length and head circumference-for-age was 94.3%, 93.2%, 90.6%, and 93.1%, respectively. The mean scores for HBM constructs of self-efficacy, cues to action, risk susceptibility, barriers to action, benefits to action, risk severity, and GMP knowledge were 64.09±9.92, 89.95±11.77, 44.71±6.73, 54.81±10.52, 60.23±9.59, 66.52±9.33, and 46.83±5.44, respectively. Higher GMP knowledge was associated with higher weight-for-length (β=0.345, 95%CI; 0.064- 0.625, P=0.016) and head circumference-for-age (β=0.287, 95%CI; 0.022-0.596, P=0.025). Higher weight-for-age was significantly associated with higher scores of GMP knowledge (β=0.409, 95%CI; 0.011-0.806, P=0.044), barriers to action (β=0.155, 95%CI; 0.025-0.284, P=0.019) and cues to action (β=0.190, P=0.03, 95%CI; 0.017- 0.362).

Conclusion: Mothers' beliefs and knowledge about GMP can affect child growth and should be considered in educational interventions to increase their participation in GMP program and ultimately improve their child growth.

*** Corresponding Author:**
Fatemeh Borazjani, PhD.
Address: *Department of Nutrition, Faculty of Allied Sciences, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.*
Tel: *+98 (61) 33112665*
E-mail: *fa.borazjani@gmail.com*

Highlights

- The Health Belief Model (HBM) is one of the most widely used models developed to explore health-related behaviors.
- Maternal knowledge about growth monitoring and promotion was associated with higher weight for age and other anthropometric parameters in their child.
- Cues to action are stimuli that encourage maternal participation in GMP and are associated with higher weight for age.

Plain Language Summary

The growth monitoring and promotion (GMP) program has been established to support children's growth and health and provide further promotional activities, including counseling mothers to enhance their actions. The present study was conducted to assess maternal beliefs and knowledge about GMP and determine its relationship with their child growth parameters. Most of women had planned pregnancy. Higher weight-for-age was significantly associated with higher GMP knowledge and beliefs of barriers and cues to action. Therefore, we can say that improving maternal beliefs and knowledge about GMP can be helpful in improving child growth.

Introduction

The Growth Monitoring program is used for regular monitoring of child growth. From the 1980s, this program was promoted by including counseling and interaction with mothers to improve their actions, and turned into the Growth Monitoring and Promotion (GMP) program [1]. The GMP is a nutritional intervention in which children's weight is measured and plotted, and parents are counseled based on their child growth concerns [2]. GMP, which is an essential part of child health care practices in the world [3], is the best method for assessing nutritional status and detecting malnutrition in children [4]. It can help the timely diagnosis and prevention of child growth problems and their consequences in the early stages. Accordingly, it can help improve children's nutritional status, growth and health, and ultimately reduce their mortality [5, 6]. Since the damages in the early stages of growth are usually irreversible [5], the GMP' main focus is on children under 2 years of age [7], which is recommended to be performed once a month [8].

Anthropometric measurements that are used clinically to diagnose malnutrition and monitor child growth include length-for-age (L/A), weight-for-age (W/A), weight-for-length (W/L), and head circumference-for-age (HC/A) [9]. Head Circumference (HC) measurement is an important anthropometric parameter. It is a major indicator of brain development, especially in early childhood, and is correlated with cognitive function [10]. The height-for-age parameter allows assessing the adequacy of linear growth in relation to age. Since the height changes very slowly in comparison to body weight, the observation of stature deficits can only be detected when there is a nutritional deficiency over a long period of time [11]. Monitoring these parameters over time, which make up the main part of the GMP, is crucial for detecting inadequate growth patterns and any underlying diseases [12].

GMP is globally accepted and many countries, including Iran, are currently using it to assess the children's growth [1]. However, due to low participation and poor knowledge, its actual practice is not optimal [10]. In a systematic review study on GMP [13], it was stated that a low participation in GMP can be a sign of its low acceptance in the society. Since the effectiveness of any behavioral change techniques and health education programs largely depends on selecting an appropriate approach, the first step is to find out which factors affect the current behavior of people [14]. To improve mothers' participation in GMP program and reach an optimal function, it is necessary to explore their attitude and knowledge about the program. Despite the importance of active participation, there is scant research on maternal attitudes towards the GMP. Therefore, this study aims to evaluate mothers' attitude and knowledge about the GMP using a quantitative approach based on the Health Belief Model (HBM), and to determine their association with socio-demographic factors and child growth parameters. HBM is a conceptual model designed to explain and predict health-related behaviors [15]. It has been used for more than 40 years, and its

ability to explain various health-related behaviors has been shown in many times [16].

Despite the importance of regular attendance, relatively little research has been conducted on maternal beliefs toward GMP. Therefore, we aimed to use HBM among mothers attending public health centers to assess their beliefs and knowledge about GMP to inform future health interventions.

Material and Methods

This cross-sectional study was conducted on mother-child dyads referred to public health centers of Ahvaz and Bushehr cities in southern Iran from August 2018 to February 2019. A two-stage sampling was used to select the study samples. First, from among all public health centers in two mentioned cities, 4 centers were selected using randomly. Then, participants were recruited using a convenience sampling method from each center. The total sample size was determined 427 based on a similar study using the HBM [17] and score of perceived benefits (Mean±SD=63.79±6.23), and d=0.01 at 95% confidence interval. By considering the dropout, the sample size was increased to 522. The inclusion criteria were: having a child under 2 years of age, having a medical record in the health center, ability to read and answer in Persian, and willingness to participate in the study. The mothers of children with preterm birth and congenital disorders were not included in the study. All mothers were informed about the study objectives and signed an informed consent form.

The data collection tool was a two-part questionnaire; the first part surveys anthropometric and socio-demographic characteristics. The father's weight and height were reported by the mothers. The child's anthropometric measurements were extracted from the postnatal medical records available in the health care center which included birth weight, height, HC, W/A, L/A, W/L, and HC/A. The status of each parameter was assessed as a dichotomous variable, based on the presence of any growth faltering or abnormality (favorable growth vs unfavorable growth). Socio-demographic characteristics such as the parents' age, Body Mass Index (BMI), years of education, employment status, and income level were self-reported by the participants. The second part was a researcher-made questionnaire designed based on the related literature on child growth monitoring [17, 18], and had 37 items assessing six HBM constructs: risk susceptibility (7 items to assess occurrence of child's unfavorable growth), risk severity (5 items to assess the risk of unfavorable child growth), barriers to action (8 items to identify the barriers of regular visits for growth monitoring), benefits to action (4 items to assess the benefits of GMP), cues to action (8 items assessing mothers' belief about the accessibility of GMP), and self-efficacy (5 items to examine the ability to visit the health center for child growth monitoring). Furthermore, there were 7 items for assessing mothers' knowledge about GMP. All items were rated from 1 (strongly disagree) to 5 (strongly agree), except for the barriers to action subscale which had reversed scoring where a higher score represents more positive belief. Three items of risk susceptibility subscale also had reversed scoring. The final score for each subscale ranges from 0 to 100. The overall score is obtained by summing up the scores of six subscales and presented per percentage. The validity of HBM-related questionnaire was examined by calculating the Content Validity Index (CVI) and Content Validity Ratio (CVR) which were obtained 0.85 and 0.82, respectively. Content validity was confirmed by 10 experts in the field of health education, public health, and nutrition. To evaluate the reliability of the questionnaire using Cronbach's alpha coefficient, it was distributed among 20 mothers referred to the public health centers with demographic characteristics similar to that of study samples. The results showed a satisfactory reliability with a Cronbach's alpha of higher than 0.72. The Cronbach's alpha coefficients for each constracts were as follows: 0.57 for knowledge, 0.71 for benefits to action, 0.80 for barriers to action, 0.53 for risk susceptibility, 0.75 for risk severity, 0.82 for cues to action, and 0.72 for self-efficacy. The internal consistency of the questionnaire was confirmed with a Cronbach's alpha coefficient of 0.80.

The questionnaire was completed by two trained researchers through face-to-face interview with participants. Statistical analyses were performed in SPSS v. 16 software. Descriptive statistics of mean and Standard Deviation (SD) were used for continuous variables, whilst frequency and percentage were applied to describe categorical variables. To determine the predictors of child growth parameters, a multinomial logistic regression was performed and then adjusted for parents' years of education and age, financial status, pregnancy intention, infant gender, and type of delivery. A $P<0.05$ was considered statistically significant.

Results

Of 522 mothers, 470 completed the questionnaires. They had a mean age of 29.56±5.10 years; 92% had a planned pregnancy and 43% had normal delivery; 86.3% had fair financial status, 87.3% had nuclear families,

Table 1. Socio-demographic and anthropometric characteristics of participants (n=470)

Variables		Mean±SD/No. (%)
Mother's age (y)		29.566±5.108
Father's age (y)		34.360±6.277
Mother's BMI (kg/m^2)		26.37±4.22
Father's BMI (kg/m^2)		26.42±3.66
Child's birth weight (Kg)		3.297±0.496
Child's birth length (cm)		50.152±3.984
Child's head circumference (cm)		35.06±2.22
Financial status	Poor Fair	63(13.7) 398(86.3)
Mother's years of education	<12 ≥12	68 (14.7) 395(85.3)
Father's years of education	<12 ≥12	77(16.9) 379(83.1)
Child's gender	Male Female	221(47.4) 245(52.6)
Type of delivery	Normal delivery Cesarean section	198(43.0) 262(57.0)
Family status	Nuclear Extended	407(87.3) 58(12.4)
Pregnancy intention	Planned Unplanned	429(92) 41(8)
Length for age	Unfavorable Favorable	26(5.7) 431(94.3)
Weight for age	Unfavorable Favorable	31(6.8) 425(93.2)
Weight for length	Unfavorable Favorable	43(9.4) 414(90.6)
Head circumference for age	Unfavorable Favorable	31(6.9) 420(93.1)

and 85.3% had more than 12 years of education. Their children's weight, length and HC were 3.29±0.49 kg, 50.15±3.98 cm, and 35.06±2.22 cm, respectively (Table 1). The mean scores of self-efficacy, cues to action, risk susceptibility, barriers to action, benefits to action, and risk severity were reported 64.09±9.92, 89.95±11.77, 44.71±6.73, 54.81±10.52, 60.23±9.59, and 66.52±9.33, respectively. The mean score of maternal knowledge was 46.83±5.44, and the mean score of overall HBM questionnaire was 118.66±9.71, ranging from 88 to 150.

Regarding the perceived benefits to action, most mothers (58.7%) agreed that "Monitoring a child's growth prevents malnutrition". Regarding the perceived barriers to action, most of them (62.2%) agreed that "there is no health center near our house". Most of mothers (56.4%) agreed that "lack of regular visits for growth monitoring can cause serious health problems" related to the perceived risk susceptibility contract. Regarding the perceived risk sensitivity, most of mothers (51%) agreed that "I'm worried if my baby become overweight". Most mothers (62%) agreed to the item that:

Table 2. Association between health beliefs models constracts and weight for age based on Multinomial logistic regression results

Constracts	β	Standard Error	95%CI		P
			Bound		
			Lower	Upper	
Percieved susceptibility	-0.068	0.147	-0.356	0.220	0.643
Percieved severity	-0.025	0.137	-0.293	0.243	0.855
Percieved benefits	-0.100	0.198	-0.488	0.288	0.613
Percieved barrier	0.155	0.066	0.025	0.284	0.019
Self-efficacy	-0.018	0.119	-0.251	0.215	0.882
Cues to action	0.190	0.088	0.017	0.362	0.030
Knowledge	0.409	0.203	0.011	0.806	0.044

Note: Model was adjusted for parental education and age, financial status, pregnancy intention, infant gender, and type of delivery.

"If I want, I can find health information about preventing faltering growth in my child". Finally, regarding the cues to action, 60.3% of mothers agreed to the item that: "There are various sources of information about child growth monitoring (media, parents, friends, health care provider, doctors, midwives)".

The association between HBM constracts, children anthropometric parameters, and GMP knowledge was examined using multinomial logistic regression model adjusted for parents' years of education, age, financial status, pregnancy intention, infant gender, and type of delivery. It was found that higher W/A was significantly associated with higher scores in GMP knowledge (β=0.409, 95%CI; 0.011-0.806, P=0.044), perceived barriers to action (β=0.155, P=0.019, 95% CI; 0.025- 0.284), and cues to action (β=0.190, 95%CI; 0.017-0.362, P=0.030) (Table 2). There were no significant association between mothers' GMP knowledge and child's L/A (Table 3), but mothers' GMP knowledge were significantly related to child's W/L (β=0.345, 95% CI; 0.064-0.625, P=0.016) and HC/A (β=0.287, 95%CI; 0.022- 0.596, P=0.025) (Tables 4 and 5).

Discussion

This study was conducted on mothers attended in public health centers for various reasons to assess their

Table 3. Association between health beliefs models constracts and lenghts for age based on Multinomial logistic regression results

Constracts	β	Standard Error	95%CI		P
			Bound		
			Lower	Upper	
Percieved susceptibility	0.075	0.130	-0.179	0.329	0.562
Percieved severity	0.042	0.126	-0.204	0.288	0.739
Percieved benefits	0.020	0.181	-0.334	0.374	0.913
Percieved barrier	-0.021	0.70	-1.393	1.351	0.768
Self-efficacy	-0.002	0.119	-0.235	0.231	0.984
Cues to action	0.017	0.086	-0.151	0.185	0.846
Knowledge	0.222	0.171	-0.113	0.557	0.194

Note: Model was adjusted for parental education and age, financial status, pregnancy intention, infant gender, and type of delivery.

Table 4. Association between health beliefs model constracts and weight for lenght based on Multinomial logistic regression results

Domains	β	Standard Error	95%CI		P
			Bound		
			Lower	Upper	
Percieved susceptibility	-0.068	0.099	-0.262	0.126	0.492
Percieved severity	-0.073	0.108	-0.284	0.138	0.501
Percieved benefits	-0.034	0.153	-0.333	0.265	0.826
Percieved barrier	-0.085	0.061	-0.204	0.034	0.160
Self-efficacy	-0.013	0.094	-0.197	0.171	0.892
Cues to action	0.012	0.069	-0.123	0.147	0.861
Knowledge	0.345	0.143	0.064	0.625	0.016

Note: Model was adjusted for parental education and age, financial status, pregnancy intention, infant gender, and type of delivery.

beliefs and knowledge about GMP. We also investigated whether these factors were related to child growth parameters. The scores of HBM domains were higher than 73%, which indicates positive attitudes towards GMP. In two studies in Iran, regarding the supplementary feeding and behaviors that may affect child growth, the HBM was used to assess mothers' beliefs about child growth disorders [17, 18]. In one study [17], scores of risk susceptibility and risk severity for growth disorders were lower than in our study. In another study [18], risk severity was significantly related to growth disorders; risk susceptibility and risk severity scores were higher and lower, respectively compared to our study. It has been shown that most mothers act based on their own assessment of normal growth status and visit the public health centers only when they see a visible disease. Those who believe that their child has a good growth status may find it unnecessary to participate in GMP program [14]. Accordingly, it can be said that lower perceptions of risk susceptibility and severity reduce mothers' participation in GMP.

Pregnancy intention has a significant impact on the health of mother and child, such that unintended pregnancy is associated with lower participation in prenatal care [19], and lower quality of parenting and child development [20]. However, in our study, pregnancy intention was related to neither maternal beliefs about child

Table 5. Association between health beliefs models constracts and circomference for age based on Multinomial logistic regression results

Domains	β	Standard Error	95%CI		P
			Bound		
			Lower	Upper	
Percieved susceptibility	-0.092	0.109	-0.305	0.121	0.398
Percieved severity	-0.016	0.129	-0.268	0.236	0.903
Percieved benefits	-0.135	0.193	-0.513	0.243	0.483
Percieved barrier	0.009	0.064	-0.116	0.134	0.885
Self-efficacy	0.014	0.132	-0.244	0.272	0.915
Cues to action	-0.068	0.085	-0.234	0.098	0.428
Knowledge	0.287	0.158	0.022	0.596	0.025

Note: Model was adjusted for parental education and age, financial status, pregnancy intention, infant gender, and type of delivery.

growth monitoring nor to child growth parameters. The importance of GMP is greater in parents with lower levels of education and socio-economic status, because their children are at higher risk for malnutrition [21, 22]. However, it has been shown that they have lower willingness to participate in GMP program [23, 24]. In a study in Nepal, although mothers' knowledge of GMP and access to health centers was high, their regular participation was low, since they believed that GMP was less important compared to programs like vaccination [25]. Although GMP is for children aged 0-59 months, it is discontinued for most children when vaccination is completed at age 9 months [26].

In this study, it was found that maternal knowledge of GMP was positively associated with children' W/A and HC/A. Lack of information about GMP is a reason for being reluctant to participate in GMP [14]. Since maternal knowledge and infant's nutritional status are associated with higher participation in GMP sessions [27], it is reasonable to assume that more GMP knowledge is associated with higher participation in GMP, and can lead to better child growth parameters. There is evidence that GMP, when properly performed, can significantly improve the nutritional status of children under five years of age [24]. Consistent with these results, a study showed that higher attendance in nutrition surveillance programme is associated with better child growth parameters [28].

Barriers such as long distance to the health center and lack of access to public transportation are can reduce mothers' participation despite high perceived severity [29]. In a recent study, the main barriers that negatively affected mothers' participation in GMP included long distance to the health centers and cultural constraints such as maternal workload [25]. Unexpectedly, in our study, the perceived barriers were positively associated with child's W/A. This may because higher perception of barriers and lack of access to GMP services can lead to compensatory efforts in other areas, such as attending private clinics for growth monitoring, better feeding practices, or giving the child additional nutritional supplements. In this study, maternal knowledge of GMP and cues to action were higher in mothers of children with higher W/A, which may override the effects of perceived barriers on GMP participation and child's W/A. Cues to action are elements that create a desire to perform the correct behavior. It has been shown that incentives, which are a kind of cues to action, improve the attendance in child health monitoring [7].

There are few studies on maternal beliefs towards GMP in Iran, and they have been conducted in central Iran. The advantages of this study was a larger sample size and investigating maternal beliefs about both child growth and GMP. However, there were some limitations. First, since our participants were recruited from public health centers, it is likely that they had more knowledge and positive beliefs towards GMP in addition to better growth status of their children. Moreover, in developing countries, public health centers are the main sources for GMP, while in developed countries, private clinics are the main sources [3]; however, it is believed that people with better financial status prefer private clinics for child health monitoring. For this reason, we may have lost a number of mothers who referred to private clinics for GMP.

Maternal beliefs and knowledge about GMP are associated with child growth parameters. GMP has the potential to detect and prevent child growth disorders at an early stage; therefore, understanding the factors that influence participation in GMP may be helpful in designing appropriate educational and behavioral interventions. We recommend future studies to consider parental beliefs and knowledge in future educational interventions on GMP because of their significant influence on child growth.

Ethical Considerations

Compliance with ethical guidelines

This study obtained ethical approval (Code: IR.AJUMS.REC.1397.191) from the Deputy for Research of Ahvaz Jundishapur University of Medical Sciences. All procedures were in accordance with the Declaration of Helsinki. Written informed consent was obtained from all participants.

Funding

This study was funded by Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.

Authors' contributions

Data collection: Fatemeh Borazjani, Fatemeh Najafi Sharjabad and Marzieh Araban; Raziye Tahmasebi; draft preparation: Fatemeh Borazjani and Raziye Tahmasebi; data analysis modelling and data interpretation: Maryam Seyedtabib and Kambiz Ahmadi Angali; conceptualization, design, review, and final approval: All authors.

Conflict of interest

The authors declare that they have no conflict of interest.

Acknowledgments

The authors would like to thank the Deputy for Research of Jundishapur University of Medical Sciences, Nutrition and Metabolic Diseases Research Center, and Research Institute of Clinical Sciences for their support and all mothers who participated in this study for their cooperation.

References

[1] Mangasaryan N, Arabi M, Schultink W. Revisiting the concept of growth monitoring and its possible role in community-based nutrition programs. Food and Nutrition Bulletin. 2011; 32(1):42-53. [DOI: 10.1177/156482651103200105] [PMID]

[2] Yeshaneh A, Fentahun T, Belachew T, Mohammed A, Adane D. Utilization of growth monitoring and promotion services and associated factors among children aged 0-23 months in Banja District, Northwest Ethiopia 2020: A cross-sectional study. PLoS One. 2021; 16(11):e0259968. [DOI: 10.1371/journal.pone.0259968] [PMID]

[3] de Onis M, Blössner M.The World Health Organization global database on child growth and malnutrition: Methodology and applications. nternational Journal of Epidemiology. 2003; 32:518-26. [DOI: 10.1093/ije/dyg099]

[4] Bukari M, Abubakari MM, Majeed M, Abizari AR, Wemakor A, Atosona A. Effect of maternal growth monitoring knowledge on stunting, wasting and underweight among children 0–18 months in Tamale metropolis of Ghana. BMC Research Notes. 2020; 13(1):45. [PMID]

[5] Nyang'echi E, Osero J. Effects of mobile health technologies on uptake of routine growth monitoring among caregivers of children aged 9 to 18 months in Kenya. Journal of Primary Care & Community Health. 2021; 12:21501327211010995. [DOI:10.1177/21501327211010995]

[6] Eslin RM, Tambe AB, LunicBase K, Fhumudzani ML, Gertrude MX. Adherence to growth monitoring procedures by health workers at primary health care clinics in Mopani District, South Africa. Journal of Food and Nutrition Research. 2020; 8(2):87-94. http://pubs.sciepub.com/jfnr/8/2/3/index.html

[7] Bilal SM, Moser A, Blanco R, Spigt M, Dinant GJ. Practices and challenges of growth monitoring and promotion in Ethiopia: A qualitative study. Journal of Health, Population, and Nutrition. 2014; 32(3):441-51. [PMID]

[8] Daniel B, Tesfaye N, Mekonin E, Kassa A, Mensur K, Zerihun E, et al. Knowledge and attitude on growth monitoring and its associated factors among mothers/guardians of children less than two years in Areka Town, Southern Ethiopia, 2017. Journal of Nutritional Disorders & Therapy. 2017; 7(3):1000216. https://www.walshmedicalmedia.com/open-access/knowledge-and-attitude-on-growth-monitoring-and-its-associated-factor-samong-mothersguardians-of-children-less-than-two-years-in-ar-2161-0509-1000216.pdf

[9] Wit JM, Himes JH, Buuren S, Denno DM, Suchdev P. Practical Application of linear growth measurements in clinical research in low and middle-income countries. Hormone Research in Paediatrics. 2017; 88:79–90. [DOI: 10.1159/000456007]

[10] Scherdel P, Dunkel L, van Dommelen Pv, Goulet O, Salaün JF, Brauner R, et al. Growth monitoring as an early detection tool: A systematic review. The lancet Diabetes & Endocrinology. 2016; 4(5):447-56. [DOI: 10.1016/S2213-8587(15)00392-7]

[11] Ghodsi D, Rashidian A, Omidvar N, Eini-Zinab H, Raghfar H, Ebrahimi M. Process evaluation of a national, community-based, food supplementary programme for improving the nutritional status of children in Iran. Public Health Nutrition. 2018; 21(15):2811-8. [DOI: 10.1017/S1368980018001696]

[12] Melkamu AW, Bitew BD, Muhammad EA, Hunegnaw MT. Prevalence of growth monitoring practice and its associated factors at public health facilities of North Gondar zone, northwest Ethiopia: An institution-based mixed study. BMC Pediatrics. 2019; 19(1):144. [PMID]

[13] Roberfroid D, Kolsteren P, Hoerée T, Maire B. Do growth monitoring and promotion programs answer the performance criteria of a screening program? A critical analysis based on a systematic review. Tropical Medicine and International Health. 2005; 10(11):1121-33. [PMID]

[14] Tekle M, Tariku B, Alagaw A, Zerihun E, Bekele HW. Exploring reasons for low attendance of mothers to growth monitoring and promotion program at Loka Abaya District, Southern Ethiopia: Exploratory qualitative study. Journal of Nutrition and Metabolism. 2019; 2019:3510649. [PMID]

[15] Salari R, Filus A. Using the health belief model to explain mothers' and fathers' intention to participate in universal parenting programs. Prevention Science. 2017; 18(1):83-94. [PMID]

[16] Green EC, Murphy EM, Gryboski K. The health belief model. The Wiley Encyclopedia of Health Psychology. 2020; 211-4. [DOI: 10.1002/9781119057840.ch68]

[17] Navabi S M, Khorsandi M, Roozbahani N, Ranjbaran M. [Investigating the relationship between health belief model structures with the mothers' performance in preventing growth retardation in children aged 1-5 years in Shazand City, 2014 (Persian)]. Arak Medical University Journal. 2016; 18(10):87-95. http://jams.arakmu.ac.ir/article-1-3841-en.html

[18] Hazavehi M, Taheri M, Moeini B, Roshanaei G. [Investigating causes of the infants' growth disorder (6-12 months) in Hamadan health centers based on Health Belief Model (Perian)]. Scientific Journal of Hamadan Nursing & Midwifery Faculty. 2013; 21(3):68-76. http://nmj.umsha.ac.ir/article-1-1147-en.html

[19] Hajizadeh M, Nghiem S. Does unwanted pregnancy lead to adverse health and healthcare utilization for mother and child? Evidence from low- and middle-income countries. International Journal of Public Health. 2020; 65(4):457-68. [PMID]

[20] Singh A, Upadhyay AK, Singh A, Kumar K. The association between unintended births and poor child development in India: Evidence from a longitudinal study. Studies in Family Planning. 2017; 48(1):55-71. [PMID]

[21] Islam MR, Rahman MS, Rahman MM, Nomura S, de Silva A, Lanerolle P, et al. Reducing childhood malnutrition in Bangladesh: The importance of addressing socio-economic inequalities. Public Health Nutrition. 2020; 23(1):72-82. [PMID]

[22] Khattak UK, Iqbal SP, Ghazanfar H. The role of parents' literacy in malnutrition of children under the age of five years in a semi-urban community of Pakistan: A case-control study. Cureus. 2017; 9(6):e1316. [DOI: 10.7759/cureus.1316]

[23] Moyo D, Mapulanga M. Factors influencing guardians in children attendance of Growth Monitoring Promotion from 36 to 59 months in Zambia. Medical Journal of Zambia. 2019; 46(2):74 - 80. https://www.ajol.info/index.php/mjz/article/view/188898

[24] Dagne S, Aliyu J, Menber Y, Wassihun Y, Petrucka P, Fentahun N. Determinants of growth monitoring and promotion service utilization among children 0–23 months of age in northern Ethiopia: Unmatched case-control study. BMC Nutrition. 2021; 7(1):67. [PMID]

[25] Pollifrone MM, Cunningham K, Pandey Rana P, Philbin MM, Manandhar S, Lamsal KP, et al. Barriers and facilitators to growth monitoring and promotion in Nepal: Household, health worker and female community health volunteer perceptions. Maternal & Child Nutrition. 2020; 16(4):e12999. [PMID]

[26] Seidu F, Mogre V, Yidana A, Ziem JB. Utilization of growth monitoring and promotion is highest among children aged 0–11 months: A survey among mother-child pairs from rural northern Ghana. BMC Public Health. 2021; 21(1):910. [PMID]

[27] Gyampoh S, Otoo GE, Aryeetey RN. Child feeding knowledge and practices among women participating in growth monitoring and promotion in Accra, Ghana. BMC Pregnancy and Childbirth. 2014; 14:180. [PMID]

[28] Agbozo F, Colecraft E, Jahn A, Guetterman T. Understanding why child welfare clinic attendance and growth of children in the nutrition surveillance programme is below target: Lessons learnt from a mixed methods study in Ghana. BMC Nursing. 2018; 17:25. [PMID]

[29] Roesler A, Smithers LG, Winichagoon P, Wangpakapattanawong P, Moore V. Health workers' and villagers' perceptions of young child health, growth monitoring, and the role of the health system in remote Thailand. Food and Nutrition Bulletin. 2018; 34(4):536–48. [PMID]