Original Paper

Mothers/Caregivers Age and Family Structure Predicted Knowledge on Recommended Nutrition Practices for Children under 5 Years

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Abstract

Introduction: There are recommendations regarding infant and young child feeding and when followed children's growth are optimum. These feeding practices are age definitive, starting from exclusive breastfeeding, to the transition of the child to complementary foods.

Objective: The objective of this study was to assess factors that determine nutritional knowledge among mothers/caretaker regarding children under five years.

Methods: A cross sectional study design employing quantitative methods was chosen for this study. The study population comprised 285 caregivers and their children aged of 6 and 59 months. Respondents were chosen randomly from four hard-to-reach communities and two peri-urban communities within three sub-municipalities, who lived in and accessed child welfare services during the study period. Face-to-face interviews were used to collect background and nutritional knowledge data from the respondents. Maternal/caretaker knowledge on recommended nutritional practice was split into two with scores were greater than 7 out of the 13 knowledge items was considered as good. STATA version

14 was used to analyze data and statistical significance determine at 95% confidence interval.

Results: The average age of the children under 5 years and their mothers/caretakers were 32 months and 29 years respectively. About 73% had nuclear family structure. Results of Chi square and Fisher's exact tests for association indicated that, mother's/caretaker's age (p<0.001), family structure (p=0.010) and access to media information (p<0.001) were significantly associated with mother's good nutritional knowledge on recommended practices. Mothers/caretakers age (OR=0.17; 95%CI: (0.70-0.43); family structure (OR=0.30; 95% CI (0.11-0.78) and access to media (AOR=5.12; 95% (2.46-10.69) predicted mothers nutritional knowledge.

Conclusions: Maternal/caretaker factors predicted nutritional knowledge when feeding a child in both peri-urban and rural areas. These factors should be considered when promoting child nutrition.

Keywords

maternal factors, knowledge, feeding, children under five years, care givers, nutritional knowledge

1. Introduction

About 178 million children below five years globally were too short for their age; while 115 million were underweight (Brownell & Ludwig, 2011). Half of deaths of children under 5 years in Sub-Saharan Africa are due to under-nutrition (Rajaratnam et al., 2010)). Although malnutrition can be due to myriad of factors in families, low income and inadequate nutrition knowledge (FAO, IMF, & UNCTAD, 2011). Eskezyiaw et al. (2017) found that about two-thirds of deaths of children under five are due to inappropriate feeding practices. Nutrition is influenced by the immediate and underlying causes of under nutrition should be properly understood (World Health Organization, & UNICEF, 2013). It is easier to make intervention in the basic determinant of nutritional status such as maternal/caretaker knowledge. Nutritional knowledge of mothers has been found to positively associated with nutrient intake and eating behaviors of children (Yabancı, Kısaç, & Karakuş, 2014). Malnutrition prevalence in children under five remains high in Ghana (Staveteig, 2016). Under-nutrition is common in countries where breastfeeding and complementary feeding practices are not well practiced (Lartey, 2008). Mothers' decision making regarding dietary intake have been found to be associated with child feeding practices (Zakaria & Laribick, 2014). Feeding adequacy in terms of frequency and quantity are also linked to child health (Aryeetey & Goh, 2013). Consequences of childhood under-nutrition include growth failure, impaired intellectual and physical development, lower resistance to infection, and high incidence of some chronic diseases (Demissie & Worku, 2013); human performance and decreases population survival, and it may also enhance the economic burden (Jesmin, Yamamoto, Malik, & Haque, 2011).

Malnourished children under five years have a more than nine fold odds of mortality compared with child with adequate nutritional status (Hammond, Badawi, & Deconinck, 2016). According to report by (GDHS, 2014), majority of children under five years in Ghana are under-nourished. Under nutrition indicators are worse in rural areas compared with urban areas. It is also higher in the northern regions

compared to the south. Adeba, Garoma, Fekadu and Garoma (2014) indicated that children under 5 years are under-nourished due to poor feeding practices. Inappropriately breastfed have poor health outcomes (Mohieldin, 2010). Nutrition Impact of maternal nutritional knowledge with regards to behaviour and attitude of mothers towards child nutrition is barely investigated (Greiner & Latham, 1981).

This original research therefore assessed the maternal nutritional knowledge on recommended nutritional practices with regards to children between the ages of 6-59 months.

2. Methods

2.1 Profile of Study Area

The Lower Manya Krobo Municipality (LMKM) forms part of the 26 Municipalities and Districts in the Eastern Region of Ghana. It lies between latitude 6.05S and 6.30N and longitude 008E and 0.20W. The Municipality covers a total land area of 18.310 square kilometres. The Municipality has an estimated total population of 101,098; about 24,264 out of the total population are women in fertility age (WIFA), with 4,044 expected pregnancies and 20,220 children under 5 years of age (Schmidt & Kohlmann, 2008). The municipality is divided into six sub-municipalities and five zones. Health facilities in the municipality include two public hospitals and one mission hospital, four reproductive and child health facilities, 22 CHPS zones, two private clinics, one public clinic, one private maternity home and nine traditional birth attendants (TBAs) (Schmidt & Kohlmann, 2008). The Municipality provides both curative and preventive services to the residents in the communities within the health delivery system (Schmidt & Kohlmann, 2008).

2.2 Study Population

The study population comprised children between the ages of 6 and 59 months and their caregivers living in selected hard-to-reach and peri-urban communities in the LMKM who accessed child welfare services during the study period. The study sample was chosen from 6 communities from 3 sub-municipalities (Table 1).

Table 1. Distribution of Sample Size from Study Communities in the Sub-municipality

Sub Municipality	Selected rural and peri-urban communities	Total population of children under 5	Sample size calculation	Sample size generated
Oborpa	Yonguase	283	(283/2104)*285	38
Asitey	Ayermesu	263	(263/2104)*285	36
Kpong	Tsledorm	162	(162/2104)*285	22
Kpong	Wawase	243	(243/2104)* 285	33
Kpong	Ayikpala	607	(607/2104)* 285	82
Kpong	Nuaso Old Town	546	(546/2104)* 285	74
TOTAL		**2104**		**285**

2.3 Research Design

A cross sectional study design which employed quantitative data collection methods was chosen for this study. The design enabled us collect data from a representative subset of a population at a defined time (Lower Manya Krobo Municipal Authority, 2014). The advantage is that the study outcomes were assessed at the same time (Lower Manya Krobo Municipal Authority, 2014).

2.4 Sample Size

This was determined based upon the total population of children 5 years and under in the Municipality as of 2016 (20,220), an expected frequency of malnutrition of 25%, at a confidence level of 95%, design effect of 1.0 and 3 clusters, using Epi Info (version 7) sample size calculator. This generated a sample size of 285. Weighting was used to sample respondents from each community and the distribution shown in (Table 1).

2.5 Sampling Techniques

It involves a multi-stage sampling approach. Three of the 6 sub-municipalities were randomly selected. Initially, four hard-to-reach and two peri-urban communities were randomly chosen from the selected sub-municipalities. In each of the selected communities (clusters), a central point was identified and from there, a directional compass was used to select the first household. All houses/compounds along that direction were visited and potential respondents recruited for the study. In cases where there was more than one eligible child per household or compound, one child was randomly selected to participate in the study. At the end of the first randomly selected direction, the sampling team returned to the central point and moved in the opposite direction looking to recruit respondents. The process was repeated until the end of each community was reached. Households with children under 5 years were then sampled and this formed the second stage sampling.

3. Data Collection Tools and Techniques

A semi-structured questionnaire was used and an in-depth interview was used to collect information on mothers' knowledge on standard nutritional practices.

3.1 Training of Enumerators and Supervisors

Prior to data collection, enumerators and supervisors selected for the project were trained in the use of the anthropometric equipment and the recording of data over a period of three days. This included a discussion on the purpose of the study, ethical issues and questionnaire administration. Seven individuals who completed tertiary level education were recruited and trained as field enumerators and three as supervisors for the study.

3.2 Pre-testing

The data collection tools were pre-tested a week prior to the main data collection period in Djedjeti and Agormanya, a hard-to-reach and peri-urban community respectively with similar characteristics to the selected study communities. Ten interviews were conducted at each community.

3.3 Data Handling on the Field

The field enumerators reviewed each questionnaire before leaving the households/communities. At the end of each day of fieldwork, supervisors reviewed each questionnaire for accuracy, logical patterns, and legible writing. Where any anomaly was detected by the supervisors, enumerators returned to the field and rectified.

3.4 Data Processing and Analysis

Data were entered in STATA version 14 for analyses. Proportions were presented for knowledge on factors associated with malnutrition. The variables were Child's welfare major decision taker: Both Parents, Father Mother, Other; Family Structure Extended, Nuclear, Children's food influenced by overall family menu, Regular media information on child nutrition, History of malnutrition Family Structure; Extended, Nuclear, Children's food influenced by overall family menu, Regular media information on child nutrition, History of malnutrition, Postnatal clinic attendance; Frequency of postnatal clinic attendance; less than 3, 3-5 and 6 and above. For each of the items data enumerators ticked an option which represented the response of the caregiver/mother. Proportions were also presented for mothers' knowledge on the recommended nutrition practices of children under 5 years. The items were: on whether exclusive breastfeeding should be less than six month. The options were: Babies can be fed water alongside breast milk within the first six months, complementary food should be introduced within the first six months. The next question was whetherconsumption of fish and, or meat should be more in children than adults and the options were, fruit consumption should be more in adults than children, food consumption should be more in adults than children, inadequate food causes malnutrition. Furthermore respondents were asked whether breast feeding should begin three days, Babies should be exposed to sunlight occasionally for vitamin D, sugar, salt and honey should be added to babies' food and breast feeding should begin three days after birth. Mothers who scored 8 items were categorized as havinggood nutritional knowledge in breast feeding issues and those who scored less than eight were categorized as having poor nutritional knowledge in breastfeeding.

Chi Square statistics and Fishers exact test (X^2; degrees of freedom) were presented for factors associated with mothers' nutritional knowledge and statistical significance was set at $p<0.05$. the associations were on: mother's age (years): with options17-25, 26-35, 36-55; level of education with higher education, lower education, no education as options; marital status with options being cohabiting, married, single additional factors were ethnicity with options as Ewe, Krobo, other; occupation with options as farmer, petty trader, salary worker, other; area of residence with options as peri-urban, rural; number of children with options as: 3 or less, 4-6, 7 and above; and finally,family structure with options as: extended, nuclear, history of malnutrition and access to media information. Knowledge level on recommended practices on nutrition was categorized as low or high.

Maternal nutritional factors that were significant statistically were entered into multinomial logistic equation as explanatory variables. Crude and unadjusted Odd Ratios (OR and AOR), confidence intervals (C.I) at 95% and significance was determined at $p<0.05$. The variables were Mother's Age (Years): 17-25

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(Reference), 26-35, 36-55 Level of Education: Higher Education, Lower Education, No Education (Reference); Family Structure: Extended (Reference), Nuclear, History of Malnutrition and Access to Media Information and No, Yes (Reference).

3.5 Ethical Considerations

Ethical clearance was obtained from the Institutional Review Board of University of Cape Coast. Letters of notification were sent to the Lower Manya Krobo Municipal Health Directorate and the Ghana Educational Service. Permission was sought from the community leaders and public announcements were made various community radios. Informed consent was sought from every potential respondent before recruitment into the study. Confidentiality, voluntary participation and withdrawal, risk and benefits of the study were explained to them. Suitable atmosphere for private interactions between the field enumerators and mothers/caregivers were created, and respondent codes, and data collection personnel were trained to ensure confidentiality throughout the study.

Table 1. Frequency Distribution of Factors Associated with Malnutrition

Characteristics	Frequency (%) (N=285)
Child's welfare major decision taker	
Both Parents	14 (4.9)
Father	160 (56.1)
Mother	91 (31.9)
Other	20 (7.0)
Family Structure	
Extended	76 (26.7)
Nuclear	209 (73.3)
Children's food influenced by overall family menu	274 (96.1)
Regular media information on child nutrition	213 (74.7)
History of malnutrition	271 (95.1)
Postnatal clinic attendance	227 (79.7)
Frequency of postnatal clinic attendance	
Less than 3	133 (57.8)
3-5	83 (36.1)
6 and above	14 (6.1)

Data presented are frequencies and proportions.

3.6 Description of Factors Associated with Malnutrition amongst Caregivers

The nuclear family system was the most practiced amongst respondents. Majority (56%) of respondents mentioned that major decisions regarding child welfare were made by fathers. The overall menu of the

family was the main determinant of the child's food for 96% of respondents. Seventy five percent of caregivers asserted that there was regular media information on child nutrition. About 95% of respondents admitted that they had a history of malnutrition. Postnatal clinic attendance was high amongst respondents, with an 80% attendance rate; about 58% of the respondents had attended less than 3 sessions.

Table 2. Mothers'/Caregivers' Knowledge on the Recommended Nutrition Practices of Children under 5 Years

Characteristics	Frequency (%) (N=285)
Exclusive breastfeeding should be less than six month	41 (14.4)
Babies can be fed water alongside breast milk within the first six months	51 (17.9)
Complementary food should be introduced within the first six months	37 (13.0)
Consumption of fish and, or meat should be more in Children than adults	260 (91.2)
Fruit consumption should be more in adults than children	52 (18.3)
Food consumption should be more in adults than children	121 (42.5)
Inadequate food causes malnutrition	267 (93.7)
Breast feeding should begin three days after birth	19 (6.67)
Children need cow's milk as a drink in the first 12 months	145 (50.9)
Babies should be exposed to sunlight occasionally for vitamin D	130 (45.6)
Sugar, salt and honey should be added to babies' food	143 (50.2)
Breast feeding should begin three days after birth	19 (6.7)
Access to Media Information	8 (2.8)

Data are presented in frequency (N) and proportions (%).

3.7 Mothers'/Caregivers Knowledge on the Recommended Nutrition Practices of Children under 5 Years

Knowledge of caregivers on recommended nutritional practices for children under 5 years was subsequently assessed (Table 3). About 85% of respondents believed exclusive breast feeding should not be less than 6 months. About 17% mentioned that babies can be fed water alongside breast milk within the first 6 months. Majority of respondents reported that complementary foods should not be introduced within the first 6 months, and consumption of fish and or meat should be more among children than adults. Over 50% of caregivers were of the view that sugar, salt and honey should be added to babies' food; fruit consumption should be more in children than in adults; children need cow's milk as a drink in their first 12 months; malnutrition may be caused by refusal of child to eat; inadequate food causes malnutrition, and lack of time to feed child can lead to malnutrition. About 41% did not know whether babies should be exposed to sunlight occasionally for vitamin D. Majority of respondents (97%) did not agree with the assertion that breast feeding should be thrice daily.

Table 4. Factors Associated with Mothers'/Caregivers' Nutritional Knowledge

Variables	Knowledge Level, n (%)		X^2 (df)	P
	Low	**High**		
Mother's Age (Years)				
17-25	9 (9.68)	84 (90.32)		
26-35	18 (12.41)	127 (87.59)	21.7638 (2)	*<0.001
36-55	18 (38.30)	29 (61.70)		
Level of Education				
Higher Education	1 (4.17)	23 (95.83)		
Lower Education	42 (19.00)	179 (81.00)		0.020
No Education	2 (5.00)	38 (95.00)		
Marital Status				
Cohabiting	13 (20.97)	49 (79.03)		
Married	25 (14.79)	144 (85.21)	0.449	
Single	7 (12.96)	47 (87.04)		
Occupation				
Farmer	16 (12.90)	108 (87.10)		
Petty Trader	27 (20.15)	107 (79.85)		0.264
Salary Worker	0 (0.00)	8 (100.00)		
Other	2 (10.53)	17 (89.47)		
Ethnicity				
Ewe	10 (19.23)	42 (80.77)		
Krobo	32 (14.81)	184 (85.19)		0.695
Other	3 (17.65)	14 (82.35)		
Area of Residence				
Peri-urban	14 (12.61)	97 (87.39)	1.3800 (1)	0.240
Rural	31 (17.82)	143 (82.18)		
Number of Children				
3 or less	4 (9.76)	37 (90.24)		
4-6	25 (14.97)	142 (85.83)		0.305
7 and above	16 (20.78)	61 (79.22)		
Family Structure				
Extended	5 (6.58)	71 (93.42)	6.6122 (1)	*0.010
Nuclear	40 (19.14)	169 (80.86)		
History of Malnutrition	3 (21.43)	11 (78.57)	0.3521 (1)	0.553
Access to Media Information	18 (8.45)	195 (91.55)	34.1511 (1)	*<0.001

Results are based on Chi squared and Fisher's exact tests *Statistically significant at p<0.05.

3.8 Factors Associated with Mothers' Nutritional Knowledge

Mothers' nutritional knowledge was assessed using a set of 13 standard questions. Those who scored above average (>8) were considered as having a high nutritional knowledge. Nutritional knowledge was high amongst study participants (84%). Mother's age, (X^2=21.8; P<0.001); family structure (X^2=6.6; P=0.01) and access to media information (X^2=34.2; P<0.001) were statistically significantly associated with mother's nutritional knowledge.

Table 5. Multinomial Logistic Regression of Factors that Predicted Maternal/Caregivers Nutritional Knowledge

Variables	OR (95%)	p-value	AOR (95%)	p-value
Mothers age				
17-25 (Reference)	1		1	
26-35	0.76 (0.32-1.76)	0.52	0.74 (0.29-1.87)	0.53
36-55	0.17 (0.70-0.43)	0.00	0.26 (0.09- 0.73)	0.01
Access to Media information				
No (Reference)	1		1	
Yes	6.5 (3.30-12.81)	0.036	5.12 (2.46-10.69)	0.00
Educational level				
No Education (Reference)			1	
Higher Education		0.88	0.36 (0.03-4.76)	0.44
Lower Education		0.05	0.14 (0.03-0.67)	0.01
Family Structure				
Extended (Reference)	1		1	
Nuclear	0.30 (0.11-0.78)	0.014	0.55 (0.19-1.64)	0.29

Results are based on a multinomial logistic regression. Data are odds ratios (ORs) and 95% confidence intervals.

3.9 Multinomial Logistic Regression of Factors that Predicted Maternal/Caregivers Knowledge

Factors that showed statistical significant associations with maternal knowledge were introduced into a multinomial regression as explanatory variables. Those aged 36-55 years had 17% chance of having good education compared with those aged 17-25 years OR= 0.17; 95% CI: (0.70-0.43) Mothers form nuclear family have 30% chance having good nutritional knowledge compared with those from extended family structure OR= 0.30; 95% CI (0.11-0.78). When factors were controlled for, those who aged 36-55 years had 26% percent chance of having good nutritional knowledge compared with those aged 17-25 years (AOR=0.26; 95%CI: (0.09-0.73). Those who had lower level education had 14% chance of having good nutritional knowledge compared with those who had no education (AOR=0.14;

95% CI: (0.03-0.67). Access to media information is 51.2% associated with nutritional knowledge AOR=5.12; 95% (2.46-10.69).

4. Discussion

Studies on nutritional knowledge of mothers and care givers regarding recommended practice have rarely been conducted in Ghana and specifically Eastern Region. The present study involved 285child mother/caretaker pair in hard-to-reach area in Manya Krobo municipality on the associated and predicting factors regarding maternal/caretakerknowledgeof their children. Mothers with low education levels are more likely to live in rural areas where health care access is an issue, and they are also likely to belong to the low socio-economic class. The results of this study in this regard buttresses results from other studies conducted on the correlates of mother's nutritional knowledge and subsequently child malnutrition (Lartey, 2008; Demissie & Worku, 2013; Babatunde, Olagunju, Fakayode, & Sola-Ojo, 2011). Caregivers who have access to information are likely to have some minimum level of education are able to have access to healthcare, hence their ability to improve their nutritional knowledge over time (Nti & Lartey, 2008). This corroborates a study that suggested that ability of mothers to implement appropriate and adequate nutrition practices is hinged on adequate nutrition knowledge (Kimani-Murage et al., 2011).

4.1 Demographic Characteristics of Respondents (Mothers/Caregivers)

The age group for majority of caregivers in our study is similar to those reported in other studies on child nutritional status carried out in rural areas in Ghana (Nti & Lartey, 2008; Zeidu, 2018; Aryeetey & Goh, 2013; Nti & Lartey, 2007). Nekesa (2012) found in Kenya that demographic and socioeconomic features such as age, level of education, marital status and source of family foods were associated with the nutritional knowledge and practices of primary caregivers. The dominantly rural nature of communities sampled is a likely reason behind the low levels of education recorded amongst caregivers, a direct contrast to other studies conducted in slightly urban areas which found out that majority of women had at least tertiary education (Zeidu, 2018). Trading in most cases has been the predominant occupation reported by caregivers in various studies conducted in nutrition assessment (Akorede & Abiola, 2013); majority of our study participants were traders or involved in farming.

4.2 Caregiver Factors Associated with Malnutrition

In Ghana, very few studies have explored the association between family system and nutritional status. The nuclear family system was the most practiced amongst our study respondents. Most mothers/caregivers asserted that, they receive regular media information on child nutrition; however most respondents admitted a history of malnutrition, a development which questions how caregivers handle the information they obtained from the media regarding nutrition. Mothers/Caregivers in this respect may not necessarily abide by nutritional recommendations promoted by the various media platforms. Even though postnatal attendance was high amongst respondents, majority who attended postnatal care sessions mentioned they had attended less than three sessions at the time of this study,

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indicating the reluctance of caregivers to utilize postnatal services. Women who do not attend postnatal care are likely to have limited information regarding essential issues such as child nutrition. This finding is in agreement with a study that suggests adequate nutrition knowledge through counseling improved child feeding behaviours (Micha et al., 2014).

4.3 Mothers'/Caregivers Knowledge on Recommended Nutrition Practices of Children under 5 Years

Even though the study found out that mother's nutritional knowledge was high, feeding practices among children is suboptimal as close to half of respondents were of the view that food consumption should be more in adults. Nutrition education for mothers/caretakers positively affect eating habits of children. Mothers, therefore are the most important sources in providing nutrition knowledge to Bevan and Reilly (2011). Our finding was not in line with this suggests that factors such as money, may not be available to implement the knowledge. A study in the Accra Metropolis also found that although mothers/caretakers were knowledgeable about child feeding recommendations, feeding practices were suboptimal, especially among children receiving complementary feeding (Gyampoh, Otoo, & Aryeetey, 2014). It may also be nutritional knowledge was not provided by knowledgeable health workers (Pelto, Santos, Goncalves, Victora, Martines, & Habicht, 2004).

4.4 Determinants of the Mother's/Caregiver's Nutritional Knowledge

In this study, women with a larger family size were more likely to have low educational standards and may be deficient when it comes to nutritional knowledge. Older women in our study were more likely to have a higher nutritional knowledge. Younger mothers are likely to have little or no experience when it comes to weaning and especially child nutrition (Saaka, Wemakor, Abizari, & Aryee, 2015; Babatunde, Olagunju, Fakayode, & Sola-Ojo, 2011; Demissie & Worku, 2013); they are likely to have children who suffer from malnutrition. Also, mothers/caregivers with a lower education level were more likely to have higher nutritional knowledge. Older mothers/caretakers had 17% chance as they may through experience of attending several antenatal counseling sessions through having higher parity. Findings by Seligman (2010) supported this view that nutritional knowledge is key to good nutritional practice. The number of competing siblings impacts child malnutrition as large numbers of children is associated with an increased risk of malnutrition (Demissie & Worku, 2013). Caregivers who had a larger family size or practiced the extended family system were more likely not to have the income to support the feeding practices that conform to recommendations. Smaller family size may result in caregivers increasing the frequency of feeding, dietary diversity and improving on the protein and energy intake of their children (Vitolo, Rauber, Campagnolo, Feldens, & Hoffman, 2010). Women with lower education having better knowledge may be that nutritional education and nutritional counseling aimed at adhering to recommended nutritional practices are not taught in Ghana's educational system. Lower educated mothers/caretakers probably just attended more antenatal sessions and understood information on nutrition received.

5. Conclusions

Our study found that maternal/caretaker characteristics such as age, family structure (nuclear) and socio-demographic characteristics (level of education, access to media information) were associated with mothers/caretakers nutritional knowledge. These factors also predict maternal/caretaker knowledge on recommendation nutritional practice. Tackling high under-nutritionin the municipality by the Assembly should consider basic and the underlying factors for a sustainable improvement in child nutrition.

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