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Complementary Feeding Practices of Children 6-23 Months of Mother-To-Mother Support Groups Participants and Non-Participants in Kakuma, Turkana County, Kenya: A Cross-Sectional Comparative Study

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Abstract

Objective: The study describes comparison of complementary feeding practices of infants and children 6-23 months of mothers participating in Mother-to-Mother Support Groups (MtMSGs) and those not participating. This study was carried out in Kakuma Division, Turkana County, Kenya.

Methods: A cross-sectional comparative study was conducted in 3 locations in Kakuma division. The study targeted mothers of children 6 to 23 months of age. Systematic random sampling was used to select the 177 MtMSGs participants from 15 MtMSGs groups, as the study group and 179 MtMSGs non-participants from two locations which had no MTMSGs as the comparison group. The mothers who participated in this group had children 6-23 months. A structured questionnaire was used to collect socio-economic, demographic and complementary feeding practices data. Focused Group Discussions (FGDs) were conducted for fathers, grandmothers and Traditional Birth Attendants (TBAs). Data analysis was done using SPSS version 20. Pearson correlation (r), T test, chi-square and odds ratio were used to measure associations, relationships, comparisons and risk associated with being or not being MtMSGs participants, respectively.

Results: About 97.2% and 95.0% of children 6-23 months in both groups, respectively, had been breastfed. Significant difference was noted for complementary feeding association where MtMSGs participants were 1.8 times more likely to introduce complementary foods at 6 months while MtMSGs non-participants introduced foods earlier than 6 months. The odds ratio showed that MtMSGs participants were 1.3 times more likely to continue breast feeding up to 24 months, twice more likely to give a variety of foods, give iron rich foods and likely to have a recommended minimum meal frequency.

Conclusion: Participating in MtMSGs group led to a higher likelihood of introduction of foods at 6 months and continued breastfeeding up to 2 years. Children of MtMSGs participants were more likely to consume food from 4 or more food groups and rich in iron than those of non-participants. This study therefore recommends use of MtMSGs to enhance the sensitization of mothers on exclusive breastfeeding, continued breastfeeding and optimal complementary feeding.

Keywords: Mother-to-mother support groups; Complementary feeding practices

Abbreviations

ANC: Antenatal clinic; BFHI: Baby Friendly Hospital Initiative; FGD: Focused Group Discussion;; IYCF: Infant and Young Child Feeding; KDHS: Kenya Demographic and Health Survey; KNBS: Kenya National Bureau of Statistics; MDG: Millennium Development Goal; MIYCN: Maternal, Infant and Young Child Nutrition; MtMSGs P: Mother-to-Mother Support Groups Participant; MtMSGsNP: Mother-to-Mother Support Groups Non-Participant; MoH: Ministry of Health; MtMSGs: Mother-to-mother support groups; TBA: Traditional Birth Attendant; UNICEF: United Nations Children's Emergency Fund; WHO: World Health Organization

Introduction

The rights of children and infants are well defined in the Convention on the Rights of the child. One of them being right to good food and thus, good nutrition [1]. Good nutrition promotes optimal

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growth, development, and health and nutrition status [1,2]. Poor infant and young child feeding practices such as poor breastfeeding and sub-optimal complementary feeding threaten a child's health and survival [1].

Optimal infant feeding reduces child mortality by 19% with exclusive breastfeeding contributing the highest reduction in child mortality by 13% Poor nutrition causes 45% of deaths in children under five worldwide. Complementary foods of insufficient quantity and poor quality, poor feeding practices and frequent infections during the period of 6-23 months are risk factors for stunting [3,4].

Globally, only 41% of infants are exclusively breastfed up to 6 months. This is below the 2030 target of 70% [5]. Complementary feeding is started too early or too late in most countries [6]. Complementary foods are mostly inadequate in nutrition content and is prepared under poor hygienic conditions rendering them unsafe [2].

In Kenya, introduction of complementary foods is early with 15% of infants given complementary feeds at the age of 2-3 months [7]. The feeds are nutritionally unacceptable with only 21 percent of children 6 to 23 months of age fed an acceptable diet. Studies in Kenya and globally have shown poor dietary diversity. Children 6-23 months consume diets inadequate in nutrients hence do not meet their needs [8,9,10]. Dietary diversity and meal frequency are associated with wasting as shown in a study in Kahawa West slums in Nairobi, Kenya. Similar findings were reported in Korogocho slums [11,12].

The government of Kenya is committed to improving child health and nutrition in line with the big 4 agenda. The National Nutrition Action Plan has set complementary feeding targets to improve "proportion of children 6 to 23 months consuming 3+ or 4+ food groups in a day (dietary diversity) from 39% (2008) to 67% [13,14]. The National Strategy for Maternal Infant and Young Child Nutrition (MIYCN; 2012-2017), highlights timely, appropriate, adequate and safe complementary feeding for children 6-23 months [15].

The Government of Kenya in collaboration with other organizations has put up initiatives to improve Infant and Young Child Feeding (IYCF) practices. The government further developed Baby Friendly Community Initiative (BFCI) guidelines in 2016. The BFCI 2016 guideline states formation of Mother-to-Mother Support Groups (MtMSGs) as an intervention to improve child nutrition and health information at the community level [16]. Mother-to-mother support group is a peer support group composed of breastfeeding and pregnant mothers who meet on regular basis to "provide emotional, appraisal and informational assistance by a created social network of members who possess experiential knowledge of a specific behavior or stressor and has similar characteristics as the target population" [17]. Mother to mother support groups provide individual counseling, information, support group discussions to enable women to practice breast-feeding and child care. These groups have a special role, different from, but complementary to, the role of health services and health professionals.

Background to the Study

With formation of MtMSGs, it is expected complementary feeding practices will be improved. This is because MtMSGs are aimed at improving the knowledge of mother in regards to IYCF, which is presumed to improve IYCF practices. Other factors affect optimal IYCF practices and include availability of time, peer influence, maternal age, maternal education level, cultural beliefs and practices. Forming MtMSGs while other influencing factors are not addressed may not necessarily improve complementary feeding practices [18]. In order to ascertain the contribution of MtMSGs on improving complementary feeding practices of children 6-23 months, this study sought to fill this information gap by comparing the complementary feeding practices between mothers in MtMSGs groups and mothers not in the MtMSGs in the proposed study area.

Methods

The study adopted a cross-sectional comparative study design with qualitative and quantitative analysis. This method was adopted as it has been used in several nutrition studies where data is collected at a single point in time to assess nutrition indicators [19].

Study area and population

This study was carried out in Kakuma Division host community. Kakuma Division has 3 locations i.e., Kakuma, Pelekech and Nakalale, with a total population of 97,114. The study targeted mothers of children 6-23 months in Kakuma Divisiion. Mothers with children 6-23 months from Kakuma location who were MtMSGs participants formed the study group. Mother from Nakalale and Pleekech with children 6-23 months who were not participants of MtMSGs formed the comparison group. 450 lactating women with children 6-23 months were enrolled in the MtMSGs in Kakuma location at the time of the study. There were about 620 mothers from Pelekech and Nakalale locations with children 6-23 months who had not joined the MtMSGs.

Sampling

The study employed purposeful sampling of villages in Kakuma because they had active MtMSGs. Pelekech and Nakalale were selected as they were more than 10 km from Kakuma location but within a 20 km radius and did not have MtMSGs. They served as the comparison group.

The sample size was calculated using the following formula: $n=\{P1(1-P1)+P2(1-P2)\}(Z/E)^2$ where, "n" was the sample size required for each sample, Z was the confidence level, E was the error of margin and P was the prevalence (minimum acceptable diet). This gave a total of 171 mothers for each group. 10% was added to the sample to cater for non-response rate. This gave a total of 188 per group.

From Kakuma location, there were 15 MtMSGs, each with about 30 mothers with children 6-23 months forming a population of 450. From a list of the 450, systematic random sampling was adopted to select the 188 respondents. The n^{th} term was formed by dividing 450/188=2.3. Thus, every second respondent was taken. For MtMSGs non-participants, a census was done to ascertain the number of mothers with children 6-23 months. From the census, there were 620 mothers with children 6-23 months. The n^{th} value was obtained by dividing the total number of mothers with the sample size i.e., 620/188=3.2. Therefore, every third mother was selected from the list.

Data collection

Data was collected using researcher administered the questionnaires to 177 MtMSGs participants and 179 MtMSGs non-participants. 10 FGDs were conducted to fathers, grandmother and TBAs. Each FGD had a maximum of 10 participants and a minimum of 6 to ensure active participation during the interview. The researcher ensured that each group had participants with almost

similar characteristics in terms of gender, age, socio-economic, education and religion.

Data analysis

Data on dietary intake 24-hour recall was analyzed using SPSS version 20. Level one data analysis involved descriptive statistics using the measures of central tendency. Second level of analysis involved inferential statistics where concepts, relationships and comparisons were determined. Chi-square was used to assess the relationships between socioeconomic and demographic factors and complementary feeding practices. Odds ratio was used to measure the level of risk associated with being or not being in mother to mother support group and breast-feeding status as well as age of introduction of complementary foods. T-test was used for comparisons of complementary feeding practices between the two groups. Statistical significance was set at $p<0.05$.

Ethical approval

Clearance and approval to conduct research was obtained from Kenyatta University Ethical Review Committee reference number KU/ERC/APPROVAL/VOL.1 (270). A research permit was obtained from National Commission for Science, Technology and Innovation reference number NACOSTI/P/18/60359/25790. Authority to conduct research was obtained from the Sub-county Ministry of Health in Turkana West Sub-County. Verbal and written voluntary informed consent was obtained from the mothers to participate in the study. There was full disclosure of possible benefits and compensation and participants were free to pull out from the study at any point.

Results

Demographic and socio-economic characteristics of mothers

Table 1 shows that slightly more than one-third of the study population comprised of women aged 25-29 years in both MtMSGs participants and MtMSGs non-participant groups. Those aged 30-34 years accounted for 19.8% and 20.7% for MtMSGs participants and MtMSGs non-participant, respectively with those below 20 years accounting for 4.5% and 6.1% in MtMSGs participants and MtMSGs non-participant. Similarly, those above 40 years accounted for a relatively small percentage for either group. Male household heads accounted for 78.0% and 81.6% for the MtMSGs participants and MtMSGs non-participant, respectively. The female household heads trailed with 22% and 18.4% for the MtMSGs participants and MtMSGs non-participant, respectively as shown in Table 1. A significant proportion of the study respondents were married; 79.7% for the MtMSGs participants and 84.4% for the MtMSGs non-participants. Widows and widowers accounted for 9% and 5.6% for the MtMSGs participants and MtMSGs non-participants, respectively. Single parenthood, separation and divorce accounted for 5.1%, 1.7% and 4.5% in that order for the MtMSGs participants. Similar trends were witnessed for the MtMSGs non-participants. The study population was predominantly Christian with case group accounting for 88.7% and control group 84.9%. Muslims and traditional religious and those with no religion at all combined trailed with 11.6% and 25.1% for the MtMSGs participants and MtMSGs non-participants, respectively.

Slightly more than half (50.3%) of the MtMSGs participants and 52.5% of the MtMSGs non-participants had attained primary school. The remaining portion had attended school at different stages. The research found that of the 18.6% of the respondents in the MtMSGs participants had attended secondary school with their MtMSGs non-participants counterparts accounting for 22.9%. Lower than primary educational attainment accounted for 17.5% and 13.4% for MtMSGs participants and MtMSGs non-participants, respectively. Very low percentages of 13.6% of MtMSGs participants had attained tertiary education with similar trends being witnessed for MtMSGs non-participants as tabulated in Table 2. Business owners accounted for 38.4% and 35.8% for the MtMSGs participants and MtMSGs non-participants, respectively. The MtMSGs participants had a slightly higher percentage of housewives at 36.7% than the MtMSGs non-participants (34.1%). Casual labour as the main source of livelihood accounted for 13% and 18.4% for MtMSGs participants and MtMSGs non-participants, respectively. Formal employment accounted for 6.2% (MtMSGs participants) and 3.9% (MtMSGs non-participants) with informal employment and dependents trailing with less than 3% each for either group as shown in Table 2. Monthly income tabulations indicated that about one-third of either group earned an average of 5,001-10,000 Kshs in which MtMSgs non-participants

Table 1: Demographic characteristics.

Variable	Characteristic	MtMSG participant		MtMSGs Non-participant		*P* Value
		n (177)	%	n (179)	%	
Age of mothers in years	<20	8	4.5	11	6.1	P>0.005
	20-24	38	21.5	37	20.7	
	25-29	61	34.5	59	33.0	
	30-34	35	19.8	37	20.7	
	35-39	21	11.9	24	13.4	
	>40	14	7.9	11	6.1	
Household head	Male headed	138	78.0	146	81.6	P>0.005
	Female headed	39	22.0	33	18.4	
Marital status	Married	141	79.7	151	84.4	P>0.005
	Single parent	9	5.1	7	3.9	
	Divorced	8	4.5	7	3.9	
	Widowed	16	9.0	10	5.6	
	Separated	3	1.7	4	2.2	
Religion	Christian	157	88.7	152	84.9	P>0.005
	Muslim	9	5.1	3	1.7	
	Traditional	8	4.5	16	8.9	
	None	3	1.7	8	4.5	

Table 2: Socio-economic characteristics.

Variable	Characteristic	MtMSGs P		MtMSGs NP		*P* Value
		n (177)	%	n (179)	%	
Education level	Below primary	31	17.5	24	13.4	P>0.005
	Primary	89	50.3	94	52.5	
	Secondary	33	18.6	41	22.9	
	Tertiary	24	13.6	20	11.2	
Occupation	Formal employment	11	6.2	7	3.9	P>0.005
	Informal employment	5	2.8	4	2.2	
	Casual labor	23	13.0	33	18.4	
	Own business	68	38.4	64	35.8	
	Hawking	2	1.1	5	2.8	
	Dependent	3	1.7	5	2.8	
	Housewife	65	36.7	61	34.1	

Table 3: Frequency and duration of breastfeeding.

		MtMSGs P		MtMSGs NP		*P* Value
		n (177)	%	n (179)	%	
Frequency of Breastfeeding	On demand	163	92.1	138	77.1	P<0.005
	Fixed schedule	14	7.9	41	22.9	
Duration of Breastfeeding	Never	5	2.8	9	5.0	P<0.005
	7-9 months	12	6.8	12	6.7	
	10-12 months	13	7.3	22	12.3	
	13-15 months	16	9.0	53	29.6	
	16-18 months	35	19.8	37	20.7	
	19-21 months	47	26.6	34	19.0	
	>21 months	49	27.7	12	6.7	

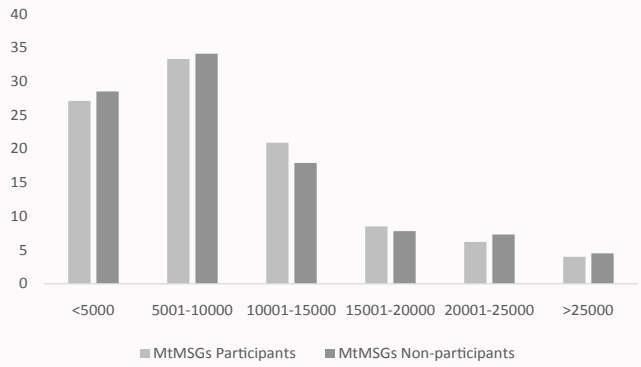

Figure 1: Income level among mothers.

scored 34.1% and their corresponding counterparts recording 33.3%. Coming in second was the group whose monthly earning range was less Kshs. 5,000 in which MtMSGs non-participants scored 27.1% and their corresponding counterparts recording 28.5%. There were very few members from either group whose income was above Kshs. 25000 as shown in Figure 1.

Breastfeeding Practices of MtMSGs participants and non-participants

95% of children 6-23 months of MtMSGs non-participants had been breastfed at one point in their lives. Similarly, a higher percentage (97.2%) of MtMSGs participants' children had been breastfed at some point in their lives as shown in Figure 2. At the point of data collection, 61% of the children of mothers belonging to MtMSGs participants were still breastfeeding while only 51.4% of children 6-23 months of MtMSGs non-participants were still breastfeeding.

Frequency of breastfeeding also mattered in the study. The results indicated that 92.1% of the children of MtMSGs participants were breastfed on demand and 7.9% on fixed schedule. As for MtMSGs non-participants, 77.1% were breastfed on demand while 22.9% on fixed schedule as shown in Table 3. The study also sought to determine the duration of breastfeeding of children of MtMSGs participants and MtMSGs non-participants. A significant proportion of children of MtMSGs participants (74.1%) stopped breastfeeding between the ages of 16 months and above. Those who had been breastfed for less than a year in this group accounted for 14.1% while only 9% had breastfeed for 13-15 months. A very small percent (2.8%) had not breastfed at all. As for the control group, 46.4% had been breastfed for 16 months and above while those breastfeeding their children for

Table 4: Reasons why the child stopped breastfeeding.

	MtMSGs P		MtMSGs NP	
	n (69)	%	n (187)	%
Baby ill	21	11.9	18	10.1
Baby refused to suckle	4	2.3	9	5.0
Mother refused to breastfeed	2	1.1	10	5.6
Spouses recommended	5	2.8	9	5.2
Mother was sick	18	10.2	15	8.4
Sore or cracked nipples	4	2.3	3	1.7
Mother away	7	4.0	8	4.5
Baby was old enough to stop breastfeeding	8	4.5	15	8.4

Table 5: Introduction of other foods besides maternal breast milk.

		MtMSGs P		MtMSGs NP	
		N (177)	%	N (179)	%
Is the child introduced to foods?	Yes	164	92.7	172	96.1
	Not	13	7.3	7	3.9
Reasons for not introducing the foods	Just Clocked 6 Months	8	4.5	2	1.1
	Sick	6	3.4	5	2.8

Table 6: Age of introduction of other foods.

	MtMSGs P		MtMSGs NP	
	n (177)	%	n (179)	%
<4 Months	23	13.0	48	26.8
4-5 Months	59	33.3	77	43.0
6 Months	82	46.3	47	26.3
> 6 Months	13	7.3	7	3.9

less than a year accounted for 19% and 13-15 months accounted for 29.6%. The remaining 5% had not breastfed their children at all.

Reasons why the child stopped breastfeeding

The investigator sought to determine reasons why the children stopped breastfeeding at the various stages as indicated in Table 4. The results indicated 11.9%, 10.2% and 4.5% of babies being sick, mothers' illness and baby being perceptively old enough, respectively, as reasons for cessation of breastfeeding for MtMSGs participants. As for the MtMSGs non-participants, maternal sickness and baby being perceptively old enough accounted for 8.4% each with mothers' refusal to continue breastfeeding and spousal recommendation accounting for 5.6% and 5.2%, respectively.

Complementary Feeding Practices of MtMSGs Members and Non-members in Kakuma division

Introduction of complementary food: The study interrogated whether children had been introduced to other foods in addition to breastfeeding. Majority of the children belonging to MtMSGs participants (92.7%) had been introduced liquids, semi-solids and solids. A similar trend was reported among non-members of MtMSGs non-participants who accounted for 96.1% as shown in Table 5. Further inquiries were made to determine the age at which foods were introduced. Slightly less than half (46.3%) of children of MtMSGs participants had introduced other feeds before the age of six months. On the other hand, 69.8% of MtMSGs non-participants introduced complementary foods before the age of 6 months as shown in Table 6. Both groups had delayed introduction of complementary

Table 7: Age at first introduction of water, cereals and meats.

		MtMSGs P		MtMSGs NP	
		n (177)	%	n (179)	%
Water	At 1 week	4	2.3	15	8.4
	1-3 Months	24	13.6	29	16.2
	4-5 Months	44	24.9	58	32.4
	6 Months	105	59.3	77	43.0
Cereals	<4 Months	18	10.2	31	17.3
	4-5 Months	37	20.9	47	26.3
	6 Months	47	26.6	55	30.7
	7 Months	49	27.7	31	17.3
	8 Months	14	7.9	11	6.1
	>9 Months	12	6.8	4	2.2
Meats	<4 Months	0	0.0	1	0.6
	4-5 Months	4	2.3	6	3.4
	6 Months	21	11.9	36	20.1
	7 Months	102	57.6	97	54.2
	8 Months	49	27.7	39	21.8
	>9 Months	1	0.6	0	0.0

Table 8: Age at first introduction of fruits and vegetables.

		MtMSGs P		MtMSGs NP	
		n (177)	%	n (179)	%
Vegetables	<4 Months	2	1.1	3	1.7
	4-5 Months	6	3.4	8	4.5
	6 Months	21	11.9	32	17.9
	7 Months	96	54.2	97	54.2
	8 Months	41	23.2	32	17.9
	>9 Months	11	6.2	7	3.9
Fruits	<4 Months	24	13.6	29	16.2
	4-5 Months	81	45.8	91	50.8
	6 Months	35	19.8	38	21.2
	7 Months	23	13.0	15	8.4
	8 Months	14	7.9	6	3.4
	>9 Months	0	0.0	0	0.0

foods with MtMSGs participants having a higher percentage (7.3%) of children introduced to complementary foods after 6 months. A significant portion 59.3% of MtMSGs participants introduced their children to water at the age of six months followed by 24.9% who introduced water at 4-5 months. Another 13.6% introduced water at age of 1-3 months to their children with 2.8% introducing water to children during their first week of life. Comparatively, as for MtMSGs non-participants, 43% of them introduced water to their children at the age of six months. The same percentage (34.7%) was recorded in children at the age of six and 7 months with 4-5 months, 1-3 months and one-week accounting for 32.4%, 16.2% and 8.4% in that order as shown in Table 7.

Introduction of cereals in children of MtMSGs participants was more common at seven months representing 27.7% unlike in their counterparts in which 17.3% for the same age group. An inverse trend was recorded for children aged six months for both

Table 9: Complementary feeding practices.

Indicator	Age group	MtMSGs P N=177		MtMSGs NP N=179		P Value
		No.	%	No.	%	
Minimum dietary diversity	6-23 months	27	15.3	13	7.3	-
Minimum meal frequency	6-11 months	18	10.2	16	8.9	0.064
	12-17 months	24	13.6	21	11.7	
	18-23 months	26	14.7	24	13.4	
	Overall	68	38.4	61	34.1	
Minimum acceptable diet	6-11 months	11	6.2	6	3.4	0.74
	12-17 months	13	7.3	8	4.5	
	18-23 months	15	8.5	12	6.7	
	Overall	39	22.0	26	14.5	
Consumption of iron rich foods	6-11 months	25	14.1	21	11.7	1.2
	12-17 moths	35	19.8	30	16.8	
	18-23 months	41	23.2	34	19.0	
	Overall	101	57.1	85	47.5	

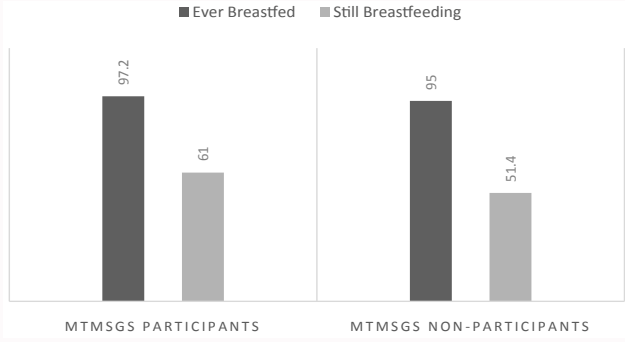

Figure 2: Breastfeeding practices.

MtMSGs participants and MtMSGs non-participants who recorded at 26.6% and 30.7%, respectively. A significant portion of children below six had been introduced to cereals before clocking at the ages of 4-5 months with the MtMSGs participants and MtMSGs non-participants accounting for 20.9% and 26.3%, respectively. About 14.7% of MtMSGs participants delayed introducing cereals to their children up to the age 9-10 months and above while only about 8.3% of MtMSGs non-participants delayed introduction of cereals to 9-10 months as shown in Table 7. Introduction of meat took relatively longer time to take place. A higher percentage of 57.6% of MtMSGs participants introduced meat at the age of 7 months unlike their MtMSGs non-participants who accounted for 54.2%; with mothers for children aged 8 months replicating the same dietary practice. Remarkable variations were also witnessed on the percentage of MtMSGs participants introducing their children to meat at the age of six months with members and MtMSGs non-participants accounting for 11.9% and 20.1%, respectively as laid out in Table 7.

Vegetables appeared to be delayed up until children were 7 months with each group accounting for 54.2%. Table 8 shows that 23.2% of the MtMSGs participants and 17.9% of MtMSGs non-participants introduced their children to vegetables at the age of 8 months. More MtMSGs non-participants (6.2%) offered their children vegetables below the age of 6 months unlike in the MtMSGs

Table 10: Relationship between socio-economic and demographic factors and complementary feeding practices.

Variable		Test	P value
Age of mother	Age of introduction of CF	Chi square	0.015
	Breast feeding status	Chi square	0.027
	Duration of CBF	Chi Square	0.031
Marital status	Age of introduction of CF	Chi square	0.41
	Breast feeding status	Chi square	0.078
	Duration of CBF	Chi square	0.21
Education	Age of introduction of CF	Chi square	0.003
	Breast feeding status	Chi square	0.024
	Duration of CBF	Chi square	0.017
Income	Age of introduction of CF	Chi square	0.541
	Breast feeding status	Chi square	0.094
	Duration of CBF	Chi square	0.124

Table 11: Association of group membership and breastfeeding practices.

	Still breast feeding	Stopped breast feeding	Total	OR (p value)
Member of group	108 (61.0%)	69 (39.0%)	177	1.32 (0.024)
Not a member	92 (53.2%)	87 (48.6%)	179	-
Total	200	156	356	-

Table 12: Association of group membership and age of introduction of complementary foods.

	Introduction of food at six months	Introduction of food before six months	Total	OR (p value)
Member of group	131 (74.0%)	46 (25.7%)	177	1.81 (0.015)
Not a member	56 (31.3%)	123 (68.7%)	179	-
Total	187	169	356	-

Table 13: Association of group membership and dietary diversity.

	≥4 or more food groups	<4 food groups	Total	OR (p value)
Member of group	27 (15.3%)	150 (84.7%)	177	2.297 (0.019)
Not a member	13 (7.3%)	166 (92.7%)	179	-
Total	40	316	356	-

participants who recorded 4.5%. Higher percentages (50.8%) of MtMSGs non-participants introduced their children to fruits at the age of 4-5 months than members who recorded 45.8% for the same age. Similar trends were recorded at the age of six months for both MtMSGs participants and MtMSGs non-participants accounting for 19.8% and 21.2%, respectively.

Complementary feeding practices: The mean DDS for the children was 3.71±1.6 with only 15.3% MtMSGs participants' and 7.3% MtMSGs non-participants' children achieved the minimum dietary score of four or more food groups in the past 24 hours as shown in Table 9. About 38.4% and 34.1% of children 6-23 months of MtMSGs participants and MtMSGs non-participants respectively, had achieved a minimum meal frequency of 2-3 meals per day. Only 22% and 14.5% of the children 6-23 months of MtMSGs participants and MtMSGs non-participants respectively, achieved a minimum acceptable diet. 57.1% of children of MtMSGs participants consumed iron rich food compared to 47.5% of MtMSGs non-participants as shown in Table 9.

Table 14: Association between MtMSGs participation and meal frequency.

	≥3 or more times	<3 times	Total	OR (p value)
Member of group	68 (38.4%)	109 (61.6%)	177	1.206 (0.019)
Not a member	61 (34.1%)	118 (65.9%)	179	-
Total	40	316	356	-

Table 15: Association between MtMSGs participation and consumption of iron rich foods.

	Iron rich foods	Iron non-rich food	Total	OR (p value)
Member of group	101 (15.3%)	76 (84.7%)	177	1.469 (0.019)
Not a member	85 (7.3%)	94 (92.7%)	179	-
Total	40	316	356	-

Relationship between socio-economic and demographic factors and complementary feeding practices: There was an association between the mother's age, mother's education level, marital status income level and age of introduction of complementary foods, breastfeeding status and duration of breastfeeding as shown in Table 10.

Association of group membership and breastfeeding practices: Odds ratio was used to measure the level of risk associated with being or not MtMSGs participant and breast-feeding status (Table 11). The odds ratio indicated that MtMSGs participants were 1.3 times more likely to continue breast feeding up to 23 months than those who were not who had early stoppage (OR=1.32; P=0.024 CI, 0.97 to 3.938). The study established that belonging to MtMSGs did influence the duration of breastfeeding.

Association of group membership and complementary feeding practices: Odds ratio was used to measure the level of risk associated with being or not being MtMSGs participant and complementary feeding practices. The odds ratio indicated that MtMSGs participants were 1.8 times more likely to introduce complementary food at six months than MtMSGs non-participants who introduced the foods earlier (OR=1.81; P=0.015 CI, 0.77 to 4.044, Table 12). Further results showed that MtMSGs participants were twice more likely to give a variety of foods (OR=2.297; P=0.019, CI 1.144 to 4.461, Table 13). They were likely to give iron rich foods and likely to have a recommended minimum meal frequency (OR=1.469, P=0.071, CI 0.0968, Table 14 and OR=1.207, P=0.395 CI 0.7829-1.860, respectively, Table 15).

Discussion

Turkana community is predominantly patriarchal like most Kenyan communities. The results showed that most households were male-headed. These findings agree with findings from Igembe who sought to examine effectiveness of MtMSGs in promoting exclusive breastfeeding and found that 92.4% percent of the households were male-led [20]. Males take the upper hand in decision making in most societies and thus believed that their input can go a long way in improving child feeding [21]. In a study carried out to determine male involvement in child care and feeding in Western Kenya, the results showed that men have responsibilities to their families such as providing income to meet expenses such as food purchase and medical care for the children; all which are essential for improving MtMSGs and their outcomes [21].

Results from a study carried out in the USA indicated that fathers play a role in physical and emotional support for mother and infant, validating of maternal decisions as well as financial support [22].

Single parent families largely depend on the earnings of only one adult raising their likelihood of abject poverty fivefold as a couple and limiting their ability of acquiring food [23]. Several studies have shown that majority of mothers of children 6-23 months are married and have a primary level. Their incomes are low as most are casual laborers [8,12,24,25]. The current study results agree with results from the studies.

Maternal education has been cited as one of the determinants in deciding on EBF, duration of breasting, complementary feeding and many other assorted childcare practices. In multistage stratified sampling study of 2994 mothers in Kuwait [26], higher percentages (72.4%) of mother with lower education. breastfed their infants longer than those with higher education at 56.9%. The mean duration of breast feeding was 9.9 months among illiterate mothers but declined to 4.2 months among mothers with higher educational attainment. On the other hand, children born to mothers with no education at all were weaned suddenly (49%), majorly because of occurrence of unplanned pregnancies (27.1%) or attaining the right age (25.3%). Mother with higher education attainment favored gradual weaning (53.9%) particularly because of inadequate milk (34%) or infant refusal (13.1%).

In another study carried in out in New Guinea [27], findings indicated that less than half of study population practiced EBF 6 months post pattern. The study endeavored to find mothers' knowledge of breastfeeding in which the results showed more than 75% of the mothers reported breastfeeding as superior method of infant feeding but did not know the reasons why. The sizeable gap between EBF in New Guinea and global recommendations were phenomenal and were attributed to low educational profile of the women participating in the study. The current study showed a correlation between mother's education and complementary feeding practices.

Improved sources of livelihood and income have been associated with improved health behavior and outcomes. Fifty percent of populations in ASALs live below the poverty line; which is likely to impede successful complementary feeding practices [28].

Breastfeeding practices

Majority of the children had been breastfed at some point in their lives, participation or non-participation to MtMSGs notwithstanding. These results did agree with a survey carried out in 2011 Co-funded by UNICEF, Coordinated and implemented by Ministry of Public Health and Sanitation, OXFAM GB, World Vision-Kenya, Merlin and International Rescue Committee in which it was noted that breastfeeding was universal, with over 95% of the children 0-23 months old from all the survey sites having been initiated to breastfeeding [29]. Other studies showed similar findings [7,24].

Studies in Iran showed that professional advice and baby's age influenced the duration of breastfeeding. In India, mothers in mother support groups were more likely to breastfeed exclusively up to six months compared to mothers in the control group [30,31]. The current study results agree with these results showing that mothers participating in MtMSGs were more likely to introduce food at six months as compared to mothers that were not participating in MtMSGs who introduced food earlier.

A study in Mauritius found out that majority of mothers completely terminated breastfeeding around 19-24 months in which level of education and occupation of the respondents were the top influencing factors [32]. A study in rural coastal Kenya showed that mothers who had support from the community and professionals breastfed their children longer [33]. The current study agrees with these findings because a slightly higher percentage of MtMSGs participants had breastfed their children longer (16-21 months and above).

Complementary feeding practices

This study findings agreed with results of the survey carried in 2014 which indicated that only an average of 50% of the children aged 6-8 months had begun their complementary feeding in Turkana [29].

Timely introduction of semisolids and solids such as cereals is important to ensure that children meet their nutrient needs. A study in Wajir found that 44.3% of the children were introduced to semisolid foods at the age of 6 months [34]. Another study in Turkana indicated similar trends by revealing that 36% of the children in the study had been introduced to semisolids between the age of 6 and 8 months in Turkana in 2017 [35]. Similar findings were documented in another study which showed that introduction of Ugali before initiating breastfeeding was common in the Turkana community [24].

Although WHO recommendations are well documented and emphasized, studies have demonstrated a high prevalence of early introduction of water and complementary foods before the age of 6 months. Delayed introduction of complementary foods has also been associated with nutrition deficiencies of iron, zinc, vitamin A and calcium [7,12,36-38].

Studies have shown that complementary foods are normally of poor quality, un-hygienically prepared, lacks nutrients and children often consume foods low in iron and vitamin A [8,26,39,40].

Relationship between breastfeeding and complementary practices children aged 6 to 23 months of MtMSGs participants and MtMSGs non-participants

By being associated to MtMSGs, the case group breastfed more than the control group. The odds ratio indicates that mother in the MtMSGs were 1.3 times more likely to continue breast feeding up to 24 months than those who were not who had early stoppage (OR=1.32; P=0.024 CI, 0.97 to 3.938). The study established that participating in MtMSGs did influence the duration of breastfeeding. MtMSGs offer a chance for mothers to learn basic skills on maternal and young child feeding practices. It was expected that members of MtMSGs will breastfeed longer as opposed to non-members. These results agree with findings in Igembe which showed MtMSGs to be highly effective [20].

Community-based strategies by peer-counseling have shown a rise in the number of frequency of the breastfeeding. A study conducted in Nairobi's Kibera informal settlement indicated a positive impact of using trained peer counselors to promote frequency of breastfeeding; however, this study lacked a control group [41]. In a Ghanaian study, the intervention group with the longest period of maternal breastfeeding support recorded a higher rate 90.4% followed by the control group at 74.4% [42]. In the current study, there was a significant relationship between MtMSGs membership and duration of breastfeeding at 0.686 at 95% confidence level.

Membership to MtMSGs proved to be an important factor in promoting optimal complementary feeding. The odds ratio indicated that mothers in MtMSGs were 1.8 times more likely to introduce food at six months than their counterparts who introduced foods

earlier (OR=1.81; P=0.015 CI, 0.77 to 4.044). This was attributed to the complementary feeding knowledge imparted to members during MtMSGs meetings. A study by Uchendu et al., (2009) [43] concluded that, high level of maternal nutrition knowledge enhances the understanding of mothers and their appreciation of the benefits of proper complementary feeding thus equipping mothers with skills necessary to resist external interferences and pressures that discourage timely initiation of complementary feeding. Studies from Asian countries have positively associated mother's education with IYCF with regards to timely initiation of complementary food and minimum acceptable diet [39,44].

A study in Kenya showed, 68.6% of the mothers had received information on infant feeding practice from health workers (82.5%), mother/in-law 8.8%, friend and neighbors (6%), internet and books (3.8%). This same study found a strong association on maternal knowledge and introduction of appropriate feeds at the right age with a significant value of 0.45 with a P<0.05 [45]. In contrast a South African study found out that most mothers 76% had not received any education on infant feeding with only 13.5% reporting to have been taught by workers, 7% by relatives, and 3% by the media. Only few of them received information supportive information with regards to optimal frequency [46]. A study in Korogocho and Viwandani reported that, frequency of giving solids, semi-solids and soft foods at 6 months of age was scored poorest on knowledge on complementary feeding indicator [47]. In the current study, there was a significant positive relationship of 0.419 between knowledge and type of complementary feeds. By so doing, the null hypothesis was rejected because the results showed a significant difference in complementary feeding practices between mothers attending and mothers not attending MtMSGs.

Conclusion

In conclusion, this study found out that there were no significant differences in socio-economic and demographic characteristics of MtMSGs participants and MtMSGs non-participants. However, there were significant differences in complementary feeding practices and continued breastfeeding between MtMSGs participants and MtMSGs non-participants. MtMSGs participants were more likely to introduce complementary foods at 6 months and continue breastfeeding to 2 years than MtMSGs non-participants.

Recommendations

The study recommends more sensitization of mothers on exclusive breastfeeding and complementary feeding as well as scaling up of MtMSGs to other locations to ensure day-to-day support for breastfeeding and complementary feeding within the community. Further, the study recommends use of the MTMSGs to create awareness about proper breastfeeding and complementary feeding practices among those not in the group by information sharing through positive deviance model. Besides a longitudinal study should be conducted to track infant and young child feeding practices one year after mothers have exited the program to determine sustainability of the information learnt during MtMSGs.

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