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Research Article

Effect Of Nutrition Education Videos On Mothers' Knowledge, And Practices On Complementary Feeding Of Children 6-23 Months In Nairobi City County, Kenya

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Abstract

Background: Children aged 6-23 months are most exposed to malnutrition because complementary feeding is done poorly in this stage of children's growth. Efforts have been put forth to improve child nutrition but there are still significant gaps in complementary feeding. Low information on complementary feeding among mothers has been the main contributor. This study aimed to establish the effect of video use on nutrition education to improve mothers' knowledge and practices on complementary feeding. The study was conducted in Ruaraka sub-county, Nairobi City County, Kenya.

Methodology: Post intervention cross-sectional analytical design with control was adopted with 198 mothers with children 6-23 months who sought health services from selected health facilities. The study involved an intervention group that watched the short nutrition video clips on complementary feeding and a control group which did not watch the videos from a different locality but shared similar characteristics with intervention group.

Results: Most households, control (83.6%) and intervention (92.4%) groups were headed by males. The majority of mothers were married (86.4%) and Housewives (67.7%) with a mean age of 25.3 years. They were Christians (97.1%), lactating (95.2%) and had attained primary school education as highest level (46.7%). The majority, 41.1% had no specific allocation of income for purchase of food. There was a significantly higher proportion of mothers in the intervention (100%) than in the control (51.3%) who had the correct knowledge of exclusive breastfeeding (P = 0.041). A significant difference was also noted in the minimum dietary diversity score with 3.73% in control and 5.19% in intervention group with majority from intervention (95.5%) feeding their children from the four food groups as opposed to control group (30.0%) with a significant difference P = 0.006. There was also a significant difference in knowledge mean score between the intervention and control with P = 0.001. A significantly higher proportion of mothers from intervention (100%) had good knowledge of the age of initiating complementary feeding as compared to the control group (96.3%) with P = 0.021. In terms of practice, a significant difference was found between the control and intervention on complementary feeding of children 6-23 months (P = 0.021).

Conclusion: The use of audio-visual tools has been found to be effective in passing messages. Since the video clips' messages are easily understood, interpreted due to the use of the local language, Maternal and Child Nutrition and Health knowledge is easily gained by the hearers. Better practices shown in the intervention group indicates gained knowledge.

Keywords: Nutrition Education Videos; Complementary Feeding; Knowledge; Practices; Dietary Diversity; Minimum Acceptable Diet

Abbreviations

WHO: World Health Organization; UNICEF: United Nations Child Fund; MIYC: Maternal, Infant and Young Child; MIYCN: Maternal Infant and Young Child Nutrition; MCH: Mother Child Health; Glocal: Global issues on local context; KAP: Knowledge, attitude and Practices; CF: Complementary Feeding

Introduction

Developing countries are persistently experiencing triple burden malnutrition in the world today [1-3], with under-nutrition claiming up to 840 million people in the world [4]. Almost half (45%) of all < 5 years' deaths today have been attributed to undernutrition [2,5]. Appropriate nutrition is very important for optimal growth and development of children [6]. Today, inadequate quantities of complementary foods together with improper feeding practices have accelerated the rate of infection in children who haven't attained 2 years of age, making them most vulnerable to stunting [7].

Child undernutrition prevalence has been highly noted in countries with low and middle-incomes [8]. Children suffering from micronutrient deficiencies in the world today are about 2 billion because of the inadequate diet, which affects their brain development and general growth; thus poor performance in school later in life [9]. Kimani-murage has done many studies in the informal settlements in Kenya and found out that most children, 46% are stunted, and this is attributed to poor maternal knowledge, and practices on optimal complementary feeding [6,10].

Studies show that if an education system focusing on capacity building of mothers on complementary feeding may lead to optimal growth of children [11]. According to Ledoux., *et al*. video learning strengthens and heightens mastery skills leading to individual's improved knowledge and understanding, which consequently may lead to improved practice [10]. Therefore, the aim of this study was to determine the effect of video use on nutrition education in order to improve knowledge, attitude, and practices of mothers with children 6-23 months old in Ruaraka sub-county on complementary feeding. These findings will also be important as they will add to the body of knowledge, especially on evidence-based programming.

Materials and Methods

Study population and sampling

This study was guided by post intervention cross-sectional analytical design with control with 198 mother-child pairs of children aged 6-23 months who sought their health care services from Mathare North Health centre, Baba-Dogo health centre, Korogocho health centre and Kahawa West Health Centers in Ruaraka sub-county, Nairobi City County, Kenya. The sub-county was purposively selected as one with a high number of informal settlements with proportionately high populations. It was also the sub-county where Glocal (Global issues in the local context) project was being implemented. A sample size was arrived at by scientific calculation and data collected for a period of three weeks. This was enough period to reach all the sampled mothers.

Inclusion and exclusion criteria

All mothers with children 6-23 months old who had sought their health care services at least four months preceding the study from the health facilities that had been selected for this study and had consented to take part in the study were included. The four months was a proportionate period which represented ¾ or 80% of the video projections in the health facilities since they were shown for 6 months. This could bring about a gain of skills by mothers and influence change in practice. The eligible mothers who had declined the consent or moved out of the settlement were excluded. This was because participation was voluntary to all the participants. All the information and data on the number of times the mothers managed to seek the services from the health facility was referred from the hospital records for Glocal Project.

Intervention procedure

The Glocal project was a project that focused on nutrition and health for mothers and children in some areas in Kenya. This project was a collaboration between Kenya's Ministry of Health, Kenyatta University, UNICEF Kenya and the University of Helsinki, Finland. They produced Glocal videos which were used in the project. These videos had messages which targeted at enhancing the knowledge of mothers, and practices on nutrition, breastfeeding, and complementary feeding based on real-life situations.

The content of the videos was guided by the WHO's recommendations, Kenya's national guidelines on MIYC strategy for 2012 to 2017, and the MIYCN Policy. They were in a common or the mostly used language in the area (Kiswahili) which was easily understood by the residents of these areas.

The nutrition videos were projected on the TV sets for a period of 6 months in the 2 selected intervention health facilities where the mothers watched them while waiting to be served for at least 6 hours per day. When the intervention period elapsed, which was after 6 months, a survey on KAP was conducted at intervention, and control health care facilities. The control health care facilities had all the programs that are offered by Kenya's ministry of health

apart from the showing of the nutrition videos but evaluated using the same KAP tool just as the intervention.

Research instruments

Pre-tested WHO's modified structured questionnaires were used to collect data on socio-economic, and demographic characteristics of the mothers who had children of age 6-23 months. Also, the questionnaire sought information on Maternal Knowledge, and Practices on Complementary Feeding. The data collected was through face to face interviews. Socio-economic and demographic data collected included: marital status, age, religion, physiological status, educational status, household head, occupation of the household head, the occupation of mothers, budget allocation for food and decision-maker on food purchase and preparation.

Data collection procedures

After the nutrition education videos had been projected for at least 6 hours per day for 6 months in the intervention health facilities, a sample frame of the eligible mothers was drawn, the respondents pinpointed, enumerated, and then individual codes given so as to ensure that confidentiality was achieved. Similarly, in control health centers, the eligible mothers were identified, sample frame prepared and given codes for confidentiality. The consent was sought from the mothers after which a researcher-administered questionnaire which was tailored from WHO's IYCF practice indicators was expended to get facts on demographic, socio-economic features of caregivers who had children aged 6 to 23 months old, and complementary feeding information.

Statistical analyses

Data was cleaned, keyed in, and analyzed by SPSS version 21. The descriptive statistics like percentages and means were used to describe demographic characteristics, socio-economic characteristics, the knowledge, and practices of mothers on matters of complementary feeding. T-tests were used to compare differences among the intervention and control groups. The data was analyzed at a statistical significance of $P < 0.05$.

Results and Discussion

Participants' demographic characteristics

A total of 198 mothers were selected randomly from the two groups of study: 80 (40.4%) mothers from the control and 118 (59.6%) from the intervention health facilities depending on the number of mothers served within their catchment areas. The mothers were divided into 3 groups depending on the age of their infants and children (i.e. 6 to 8 months, 9 to 11 months and 12 to 23 months).

Study group	N = 198	
	N	%
Control Group	80	40.4
Intervention Group	118	59.6
Total	198	100.0

Table 1: Distribution of respondents by intervention and control group.

It was found out that 25.3% of children from the control and 26.3% children from the intervention group aged 6 to 8 months old; 25.0% from the control and 27.1% from the intervention composed of children aged of 9 to 11 months; 48.75% from the control and 46.6% from the intervention group were of children aged 12 to 23 months as shown in figure 1.

The mean age of the mothers was 24.8 ± 4.3 years from the control and 25.9 ± 4.4 years from the intervention group. The youngest participant in the study was 17 years old, and the oldest was 40 years old. Most mothers were married, 86.4% (83.8% from the control group and 89.0% from intervention) and almost all were Christians, 97.1% (95% from the control and 99.2% from intervention group). Majority of the mothers who participated in the study, 46.7% (47.5% from control and 45.8% from intervention group) reported primary school education as their highest level of education as shown in table 2.

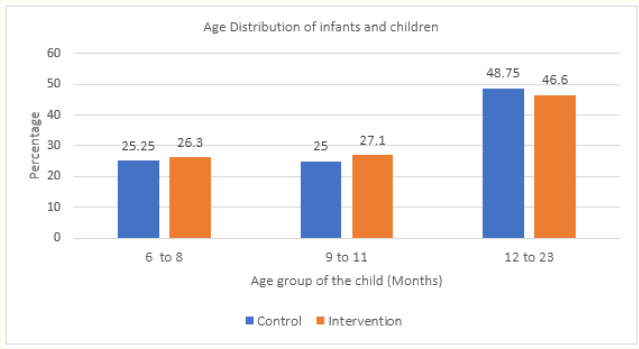

Figure 1: Distribution of infant and children's ages in control and intervention groups.

Characteristic	Control group (N = 80)		Intervention group (N = 118)		t-test P
	n	%	n	%	
Marital status					
Married	67	83.8	105	89.0	0.065
Single	1	1.3	3	2.5	
Divorced	1	1.3	1	0.8	
Separated	-	-	2	1.7	
Widowed	11	13.8	7	5.9	
Religion					
Christian	76	95.0	117	99.2	0.086
Muslim	3	3.7	1	0.8	
Hindu	1	1.3	-	-	
Physiological status					
Pregnant	1	1.3	4	3.4	0.098
Lactating	75	93.8	114	96.6	
Pregnant and lactating	1	1.3	-	-	
Not lactating	3	3.8	-	-	
Education Level					
Below Primary	7	8.8	6	5.1	0.077
Primary	38	47.5	54	45.8	
Secondary/High School	28	35.0	40	33.8	
College/Pre-university/Uni.	7	8.7	18	15.3	
Average Age Mean age (both groups)	24.8 ± 4.3 25.3 Years		25.9 ± 4.4	0.064	

Table 2: Demographic characteristics of the mother.

Significant at < 0.05.

Socioeconomic characteristics of the participants

Empowering mothers through education is a key determinant of the type of occupation she gets thus directly influencing her income, decision making and the purchasing power in the household. In assessing the main source of livelihoods, it was revealed that many household heads, 36.3% from the control group earned form casual labor and 39.0% from the intervention group earned from formal employment. In terms of occupation of the mothers most, 67.5% and 67.8% from control and intervention groups respectively were housewives. It was also found that most households, 38.7% and 44.1% control and intervention groups respectively had no specific amounts allocated for the purchase of food in the households. In terms of food purchase and preparation, most households, 88.7% in the control group and, 89.0% in the intervention group, decisions on which food to be cooked was made by the wives as shown in table 3.

Characteristic	Control group (N = 80)		Intervention group (N = 118)		t-test P Value
Occupation of HH head	n	%	N	%	
Formal Employment	21	26.3	46	39.0	
Self Employed	19	23.7	21	17.80	
Casual Labor	40	50.0	51	43.2	0.059
Occupation of the Mother					
Formal Employment	7	8.7	12	10.2	
Self Employed	19	23.8	26	22.0	
Housewife	54	67.5	80	67.8	0.085
Money allocated for food					
Largest % of HH income	4	5.0	9	7.6	
Smallest % of HH income	17	21.3	18	15.3	
Half of HH income	28	35.0	39	33.0	
No specific allocation	31	38.7	52	44.1	0.068
Decisions on use of family income					
Husband	37	46.3	82	69.5	0.092
Wife/mother	16	20.0	28	23.7	
None	27	33.7	8	6.8	
Decision on food to cook					
Husband	5	6.3	8	6.8	
Wife/mother	71	88.7	105	89.0	0.074
Children	-	-	2	1.7	
All (Parents and Children)	4	5.0	3	2.5	

Table 3: Mothers' socio-economic and household characteristics.

Significant at <0.05

Maternal knowledge on complementary feeding

Information on Infant feeding and its source

More than a half of mothers (58.7%) from control group and a high proportion (96.6%) from the intervention group reported

to have received information on complementary feeding. There was a significant difference between the control and intervention group's knowledge on information about the feeding of infants with P = 0.043. About half of mothers/caregivers (52.5%) from the control group had received information on complementary feeding of infants and young children from their mother/mother-in-laws compared to the majority of mothers (85.3%) from the intervention group who reported to have received information from the nutrition education videos as shown in table 4.

Mothers/caregivers' knowledge level on duration, frequency and amount of food infants and young children are fed

About a half of mothers (51.3%) from the control group and all mothers (100%) from the intervention group reported to have known the correct length of time a mother should exclusively breastfeed a child. Few mothers (35%) from the control group and More than a half (60.2%) from the intervention group had the correct knowledge on the recommended frequency of child feeding. Only 50% from the intervention group however were practicing breastfeeding alongside complementary feeding up to 24 months. Majority in the intervention, 95.5% reported that a child should be fed from at least 4 food groups a day. There was a significant difference between the two group; control and intervention groups (P = 0.042). The study also sought the knowledge of mothers on the age of introduction of complementary feeding to the infants. A higher proportion from both groups (96.3% from the control group and 100% from the intervention group) reported the introduction to be at 6 months. There was also a significance difference between the two groups (P = 0.021). On the consistency of the infant and young children's porridge, a high proportion from the control group, 63.7% knew that they should feed their infants and young children with thin porridge while majority from the intervention, 82.7% knew that infants and young children are fed with thick porridge exhibiting a significant difference between the control and intervention groups (P = 0.032) as shown in table 5.

Knowledge on child feeding n = 80		Control group % n = 118	Intervention group % n = 198	Total %	t-test P Value
No. of Mothers who Received information on complementary feeding	Yes	58.7	96.6	71.7	0.043
Source of information received	Mother/mother-in-law	52.5	0.9	26.7	0.065
	Neighbor/friend	7.3	0.2	3.8	
	Day care center	7.2	0.3	3.8	
	Health Worker	33.0	13.3	23.1	
	Education videos	0	85.3	42.6	

Table 4: Source of mother/caregivers' information on infant and young child feeding.

Significant at < 0.05

Maternal practice on complementary feeding of children

Decision maker on complementary feeding practices

It was found out that the majority of mothers in the households, 96.3% in control and 97.5% in intervention with P = 0.024, were the main decision-makers on what to feed the child. The study also found out that more than half of the respondents from the control group (59.7%) fed their children with thin porridge as opposed to the majority of mothers in the intervention group, 92.7% who fed their children with thick porridge. There was also a difference though not significant on the number of times a child is fed after 9 months, between the control (66%) and the intervention group (90.3%) as shown in table 6.

Maternal practices on water sanitation and hygiene

There was an assessment on the utilization of household water, sanitation and general hygiene as this is also an important component which influences young child feeding practices. Majority 98.0% (97.5% from the control group, and 98.3% from the intervention) used tap water as their main source of drinking water and a majority of mothers, 47.5% considered boiling as the safest means of treating their water for drinking.

Knowledge on the duration, frequency and amount of food a child should be fed Percentage (%)		Control group n = 80 Percentage (%)	Intervention group n = 118 Percentage (%)	Total n = 198	t-test P
Length of exclusive breast-feeding	5 months	33.7	0	16.8	0.041
	6 months	51.3	100	75.7	
	3 months and below	15	0	7.5	
Frequency of breastfeeding a child after 6 months	One time	15	0	7.5	0.064
	Thrice	45	39.8	42.4	
	On demand	35	60.2	47.6	
Length of breastfeeding before complete cessation	6-12 months	20	14.5	17.3	0.048
	12-18 months	38.5	35.5	37.0	
	24 months	41	50.0	45.7	
Decision maker on what to feed the child	Baby's mother	96.3	97.5	96.5	0.024
	Baby's father	1.2	2.5	1.8	
	Baby's grandmother	3.5	0	1.7	
Type of porridge best for babies	Thin	63.7	17.3	40.5	0.032
	Thick	36.3	82.7	59.5	
Age of introduction of complementary foods	After 3 months	3.7	0	1.9	0.021
	After 6 months	96.3	100	99.1	
Minimum number of food groups to feed a child per day	1-2 groups	23.7	0	11.9	0.042
	2-3 groups	46.3	4.5	25.4	
	4 and above groups	30	95.5	62.7	

Table 5: Respondent's knowledge on complementary feeding.

Significant at <0.05.

Components of question n = 80		Control group n = 118	Intervention group n = 198	Total	t-test P Value
Decision maker on what to feed the child	Baby's mother	96.3	97.5	96.8	0.024
	Baby's father	1.2	2.5	1.9	
	Baby's grandmother	2.5	0	1.3	
Porridge type the mother fed her baby with	Thin	59.7	7.3	33.5	0.047
	Thick	40.3	92.7	66.5	
How many times the mother fed the child after 9 months	More often	34	9.7	22.3	0.707
	3-4 meals + snacks	66	90.3	77.7	

Table 6: Mothers' practice on child feeding.

Significant at <0.05, values reported as percentage of n.

From the assessment which was done on the five critical times of handwashing aspect, it was revealed that majority, 23.3%, 25%, and 17.3% washed their hands before feeding, eating and after visiting the toilet respectively from the control group while 25%, 27% and 20.1% washed their hands before feeding, eating and after visiting the toilet respectively from the Intervention group. It was only few from Control group (12%) who could wash their hands when they think they are dirty as shown in figure 2. There was a difference which was scientifically significant between the two groups (P = 0.033).

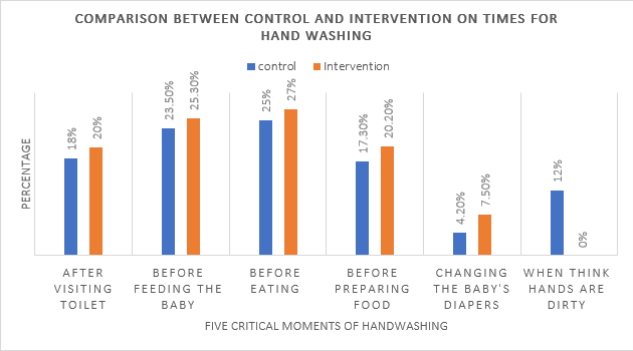

Figure 2: Comparison of hand washing practices between control and intervention groups.

Dietary diversity

The study found out that the intervention group fed their children with the diversified diet compared to the control group. Most mothers and caregivers from control group fed their children from flesh foods (56.2%), followed by other fruits and vegetables (53.8%) and grains, roots and tubers (51.2%) while majority of mothers and caregivers fed their children other fruits and vegetables (92.2%) followed by grains, roots and tubers (84.1%) then eggs (82.7%) as illustrated in figure 3.

Effect of nutrition education videos on knowledge and practices on complementary feeding among mothers of children aged 6 to 23 months in the two groups

The study found out a difference, especially in meal frequencies between the intervention (mean of 2.72 ± 1.12) and the control group (mean of 2.58 ± 1.20) though not scientifically significant, (P = 0.524). Dietary diversity exhibited a scientifically significant difference between the intervention group (mean of 5.191 ± 4.62) and the control group (mean of 3.731 ± 1.55) and P = 0.006.

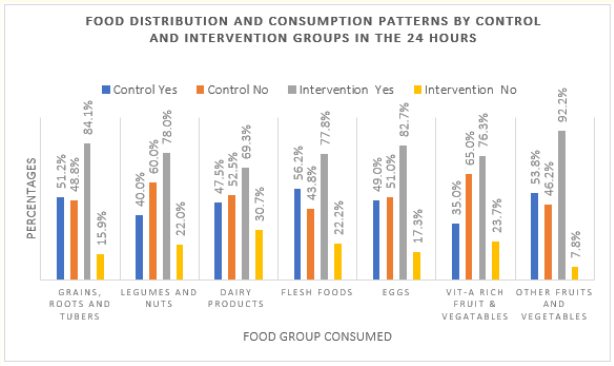

Figure 3: Food distribution and consumption patterns by children based on the 24-hour dietary recall.

In terms of knowledge score, it was also established that there was a significant difference between the control group (mean 8.110 ± 1.78) and intervention (mean of 9.842 ± 1.05) with the P = 0.001 as shown in table 7.

	Study group	N	Mean	SD	t:P value
Minimum meal frequency	Control	78	2.58	1.2	0.524
	Intervention	118	2.72	1.12	
Dietary diversity score	Control	78	3.73	1.55	0.006
	Intervention	118	5.19	4.62	
Knowledge score	Control	78	8.11	1.78	0.001
	Intervention	118	9.84	1.05	

Table 7: Minimum meal frequency, dietary diversity and knowledge scores.

Significant at < 0.05.

Discussion

Poor awareness creation and messaging especially on good nutrition and hygiene, are strong catalysts behind unfavorable complementary practices leading to undernutrition [1]. In the early years of child development, nutrition is widely acknowledged to be the main factor determining morbidity and mortality [3]. Complementary feeding is vital since it bridges the child's needs, for example, energy, iron and vitamin A since the requirements of the baby exceeds what the breastmilk provides [9].

In the present study, majority of the mothers were married and Christians. These findings compare with the study which was done in Nairobi on childhood vaccination in informal urban settlements [12]. Most studies have shown that the majority of the mothers in informal settlements opt to do casual labor as the main source of income [13-17]. The findings of this study also affirms this argument. This study established that majority of mothers had primary school education as their highest level of education. Similarly, other studies done in Nigeria and Nepal backs up this argument [9,11].

In demographic and socio-economic characteristics, it was reported that most households were headed by males and the majority of mothers were housewives. This is also in tandem with the studies done in Ethiopia [18]. Additionally, this study compares with that which was done in Kibera informal settlement, [13] and the other one which was done in Korogocho informal settlement [14] on the factors determining complementary feeding.

The study pointed out that most households did not have specific budgets allocated for food and decisions on which foods to cook were made by wives. This is in agreement with the studies which were done in Korogocho and Kahawa West in Nairobi, Kenya [14,19].

Information is powerful such that it can bring great behavior change leading to better practices in the community [11]. In this study, it was discovered that Most mothers who had received information from nutrition education videos had better complementary feeding practices compared to those who never watched videos. These findings agree with those of the study done in Kibera by Mucheru., *et al*. on the relationship between maternal knowledge on Exclusive Breastfeeding and Breastfeeding Practices Among Mothers confirming that the source of information and the content is vital for proper practice of complementary feeding [13]. It is also in tandem with the study which was done by Toung., *et al*. affirming that videos have an influence in modifying practices [20].

This study found out multiple differences in responses to the moments of handwashing in critical times. There was a better practice in the intervention group compared to the control group. A clear difference was brought out by those who never watched nutrition videos who reported that one of the moments of handwashing was when they thought they were dirty. This can be accredited to the dissimilarity in knowledge and consequently practices amongst the control and the intervention groups. This agrees with the findings of Ledoux., *et al*. showing that using videos to educate has an influence on behavior [10].

It was found out from this study that the majority of the mothers make decision of what to feed their children and sustained breastfeeding after initiation of complementary feeding. While this is important, the study also established a significant difference on the type of porridge a child is supposed to be fed whereby the mothers from the intervention had a good understanding and practice of feeding the child with thick porridge as opposed to the mothers from the control who reported of using thin porridge to feed the child. This can be attributed to the influence of the video education used which is backed up by the studies which were done on how using videos to educate are can improve knowledge and practice [20,21].

Dietary diversity has a close link with improved nutrition status of children [22]. The study also reported that most mothers in the intervention group knew and breastfed on demand, initiated complementary feeding at 6 months, gave food from at least 4 food groups per day and their diet were diversified. This might have been attributed by the nutrition videos as opposed to the control group. This is in agreement with the study that was done to establish the effectiveness of using video-based education to modify the health behaviors in Latin and Napal respectively [23,24].

Additionally, there was better consumption from various food groups among intervention than the control, for instance, other fruits and vegetables. The findings conformed to the study, which was conducted among the immigrant Latin Mothers [25]. On dietary diversity, out of the 7 food groups for complementary foods for children aged 6 to 23 months, the significant difference could have also been attributed to the nutrition education videos which were watched in the intervention area. This is supported by the studies done on the influence of video education [10,20,26].

It was also evident in the study that due to low attainment of dietary diversity and minimum food frequencies among the control group, this made the group not to attained minimum acceptable diet. This is backed up by similar results which were realized by a study that was done in Korogocho, focusing on complementary feeding, and the relationship it has on nutritional status amid children of 6-23 months old [14]. From intervention group, there was better knowledge from the knowledge scores. The difference might have been strongly brought about by nutrition education videos

which were watched by the mothers in the intervention group since these findings agree with a study which was done on using the videos to enhance staff development so as to establish educational Partnerships by Welch and Sheridan [25].

Conclusion

The study has clearly shown that though the control and intervention groups had similar demographic and socio-economic features, there was behavior change and practice in the intervention group because of the exposure to external stimuli. The findings have explicitly showed that audio-visual tool in messaging plays a great role in imparting knowledge and bringing about behavior change especially on complementary feeding. In light of this study, there is a need to back up and invent new mechanisms for policy-makers targeting the Mother and Child Nutrition and Health, more especially among the caregivers/mothers in the informal settlements. Therefore, the focus should be geared towards equipping the health care service providing centers with videos and projection media as an intervention to achieve better indicators in maternal and Child feeding practices. Such intervention could greatly influence better knowledge gain among the mothers/caregivers, changed attitudes which will lead to improved practices on complementary feeding of children.

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Conflict of Interest

The authors declare that there is no conflict of interest in the submission and publication of this paper.

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