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**Original Research Article**

# Training, knowledge and skills of community health volunteers on complementary feeding of children aged 6-23 months in Machakos, Kenya

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## ABSTRACT

**Background**: Community health volunteers (CHVs) could help reduce malnutrition related mortality through advocacy of recommended complementary feeding (CF) practices. Low levels of education, inadequate training, and limited information on their competency in CF of children aged 6-23 months are some challenges these CHVs face. The objective of this study was to establish training, knowledge and skills of CHVs on CF.
**Method:** The study adopted a cross-sectional analytical design. A total of 168 CHVs were randomly selected. A researcher administered questionnaire was used to collect data on knowledge and training of CHVs. Observation checklist was used to assess counselling skills of CHVs on CF. Both descriptive and inferential statistics were used to analyse data.
**Results:** Findings showed that 23.2%, 66.1%, and 10.7% of participants had high, moderate and low CF knowledge score respectively. Majority (83.9%) of CHVs had fair skills. Significant associations were observed between CHVs' CF knowledge level and their occupation (AOR=1.63 CI; 1.23-8.25), education (AOR=3.36 CI; 1.07-10.59) and source of income (AOR=3.50 CI; 0.91-13.40). Overall, only 8.3% of the CHVs were competent based on knowledge on CF and their counseling skills to caregivers of children aged 6-23 months.
**Conclusions:** This study rates knowledge of CHVs as moderate and concludes that it is sub-optimal to promote appropriate CF. Counselling skills' score indicated that CHVs possessed fair skills therefore lack practical skills to execute their duties. MOH and other stakeholders should enhance training of CHVs.

**Keywords:** CHVs, CF, Knowledge, Skills

## INTRODUCTION

Poor CF leads to under nutrition which is responsible for more than one third of children's deaths globally.[2] In Kenya, 26% of children are stunted, 11% underweight and 4% are wasted.[3] Stunting is highest among children aged 6-11 months, a period when complementary foods are introduced.[3] Undernourished children have poor growth, high rates of morbidity and mortality and can suffer motor and mental developmental delay.[1] The sub-optimal CF practices also puts a country into a vicious cycle of losses in social capital related to disease and death which in turn reduces the country's productivity.[1]

Malnutrition is preventable through effective CF.[4] It is recommended that complementary foods should meet the basic criteria of frequency, amount, texture, variety, adequacy, active feeding and hygiene.[1] In Kenya however, only 39% of all children 6 to 23 months are fed in accordance with recommended optimal Infant and Young Child Nutrition (IYCN) practices and only 54%

have adequate diversity of more than three food groups in their diet.[1,5] The use of community strategy that supports and strengthens nutrition interventions and other care practices would greatly help in improving nutrition status and reduce child mortality in line with Kenya's vision 2030.[6] CHVs may facilitate the improvement in health status and quality of life in rural communities especially the underserved populations.[7] Despite wide spread application of community strategy in Kenya since 2007, neither ministry of health (MOH) nor its partners have assessed the effectiveness of the strategy in improving nutritional status based on the use of appropriate CF.[8] Most of the studies done in Kenya's community, have shown inadequate knowledge on CF among caregivers and recommended empowerment of the community with CF knowledge through use of CHVs.[9] The training curricula for the CHVs is also inadequate on CF information.[10] Furthermore, there is limited information on the knowledge, skills and practices of CHVs in advocating for appropriate CF behaviour. This study therefore aimed at assessing the training, knowledge and skills of CHVs and the information gathered may be helpful in improving the community health strategy by enhancing nutrition specific components particularly advocating for CF and hence improved feeding practices by caregivers.

## METHODS

### *Study area*

This study was carried out in Masinga Sub County in Machakos County, Kenya. The CHVs were interviewed in six selected dispensaries within the sub county. The study was conducted for one month; April, 2019. (Note; the CHVs only came to the dispensaries for interview as the study was not done on patients but on Community health volunteers).

Majority of the community members are farmers who engage in both crop farming and cattle rearing. These activities do not thrive well as the area is classified under arid and semi-arid regions of Machakos County and therefore receives little rain.[25]

### *Study design*

The study adopted a cross sectional analytical design. The dependent variable was counselling skills of CHVs to caregivers on CF while the independent variables were, knowledge and training.

### *Ethical considerations*

With approval/permission from Kenyatta university ethics and review committee, and Machakos County health management team, the study was conducted in Masinga Sub County, Machakos. Before embarking on the study, a written informed consent was obtained from each participant. Further, confidentiality during and after the study was assured to the study participants.

### *Study participants selection*

Stratified random sampling was used to select the desired sample size. Since Masinga Sub County has 410 CHVs in ten CUs, which in this case was the subgroups, a list of all CHVs in all these sub-groups was made. Using random sampling, 17 CHVs were selected from each sub group. The study reported data of 168 participants. Inclusion criteria allowed CHVs trained by MOH and having worked in the area for more than six months. Those not willing to participate were excluded.

### *Data collection tools and procedure*

A pre-tested and validated researcher administered questionnaire was used to solicit information on demographic and socio-economic factors of the CHVs, their training and their CF knowledge. Both researcher and research assistants interviewed the CHVs and noted down all the answers appropriately. This was repeated until all the sampled Community health volunteers were interviewed. An observation checklist was used to assess each CHVs' counselling skills through listening and observing as he/she counselled a care giver on CF. The CHVs were then scored as either poor (0), fair (1) or good (2).

### *Statistical analysis*

Statistical analysis was performed using SPSS version 24 software. Descriptive statistics such as frequency, percentages, means and standard deviation were used to describe the CHVs socio-economic and demographic characteristics, knowledge and skills. Inferential statistics (chi-square, t test, ANOVA, correlation and logistic regression) were used to find out relations and associations among skills and knowledge. Overall knowledge level was the total correct responses in percentages which was then categorized as low (<40%), moderate (41-69%) and high (≥70%).[11] Skills were analyzed using percentages based on counselling skill usage score.[12] A $p<0.05$ was used as the statistical significance.

## RESULTS

### *Socio-economic and demographic characteristics*

Majority (73.8%) of Community health volunteers were females and the age for majority was between 41-50 years. About 79% were married while 16.7% formed the single and windowed. Nearly half (47.6%) of the respondents were farmers and only 8.3% had some form of employment. Majority (56.5%) had primary level of education and three quarters (75.6%) were poor as they relied on less than Ksh 10,000 per month (Table 1).

**Table 1: Socio-economic and demographic characteristics of the CHVs, (n=168).**

| Variables | N | Percentages (%) |
|---|---|---|
| **Sex** | | |
| Male | 44 | 26.2 |
| Female | 124 | 73.8 |
| **Age (years)** | | |
| 21-30 | 11 | 6.5 |
| 31-40 | 35 | 20.8 |
| 41-50 | 62 | 36.9 |
| 51-60 | 40 | 23.8 |
| >60 | 20 | 11.9 |
| **Marital status** | | |
| Single | 4 | 2.4 |
| Married | 133 | 79.2 |
| Separated | 7 | 4.2 |
| Widowed | 24 | 14.3 |
| **Education level** | | |
| No formal education | 3 | 1.8 |
| Primary | 95 | 56.5 |
| Secondary | 56 | 33.3 |
| Tertiary | 14 | 8.3 |
| **Occupation** | | |
| Employed/salaried | 14 | 8.3 |
| Merchant/trader | 15 | 8.9 |
| Small scale trading | 40 | 23.8 |
| Farming | 80 | 47.6 |
| Unemployed | 16 | 9.5 |
| Casual labourer | 3 | 1.8 |
| **Monthly income (Shilling)** | | |
| Ksh ≤10,000 | 127 | 75.6 |
| 10001-20000 | 27 | 16.1 |
| 20001-30000 | 14 | 8.3 |

***Training of CHVs on CF***

Nearly all (87.5%) CHVs were trained on CF. Majority (72.6%) of CHVs had been trained by non-governmental organizations (NGOs). The duration of the training, however, short. Majority reported to have been trained for few hours (less than a day) (63.1%) while a few (24.4%) been trained for few days (1-3 days). However, 21% of CHVs had not been trained on CF (Table 2).

**Table 2: Training of CHVs on CF.**

| Variables | | N | Percent (%) |
|---|---|---|---|
| **Trained on CF** | Yes | 147 | 87.5 |
| | No | 21 | 12.5 |
| **Trainer** | MOH | 46 | 27.4 |
| | NGO | 122 | 72.6 |
| **Duration of training** | Less than a day | 106 | 63.1 |
| | Days (1-3) | 41 | 24.4 |
| | Not trained | 21 | 12.5 |

Several NGOs were involved in the training; Africa medical research foundation (AMREF) (24.4%), and 'CAN DO' (22.6%). Plan-Kenya and population, service international (PSI) however trained slightly lower numbers at 14.3% and 11.3% respectively.

***Training of CHVs on different topics***

The CHVs reported to have received training on different topics on CF. Slightly more than a quarter (26.9%) reported to have been trained on types of food with nearly a quarter (21.5%) trained on food variety and food hygiene (20.2%). Those trained on food texture were 11.4%. Training on food frequency, amount, adequacy, responsive feeding and age of initiation of CF were reported at very low levels (<10%) with those trained on responsive feeding being the least (0.5%) (Table 3). Overall, coverage of training received on CF inadequate.

**Table 3: Topics trained to CHVs on CF.**

| Variables | | Responses | | Cases (%) |
|---|---|---|---|---|
| | | N | % | |
| **Topic trained*** | Types of food | 109 | 26.9 | 75.2 |
| | Frequency | 39 | 9.6 | 26.9 |
| | Amount | 25 | 6.2 | 17.2 |
| | Texture | 46 | 11.4 | 31.7 |
| | Variety | 87 | 21.5 | 60.0 |
| | Adequacy | 7 | 1.7 | 4.8 |
| | Hygiene | 82 | 20.2 | 56.6 |
| | Responsive feeding | 2 | 0.5 | 1.4 |
| | Time of CF initiation | 8 | 2.0 | 5.5 |
| **Total** | | 405 | 100 | 279.3 |

*Multiple responses

From the focus group discussion with the CHVs, it was reported that CF training was done in addition to other health issues such as hygiene, antenatal care and immunization where the trainer would take a few hours to talk about child feeding generally.

***Knowledge of CHVs on CF***

Knowledge of CHVs was assessed using sixteen different questions on recommended CF practices and a knowledge score calculated.[1,13] The knowledge score based on the 16 questions was expressed as a percentage. The study observed a mean knowledge score of 55.77±15.07 SD. Almost all the CHVs (94%) were knowledgeable on age of initiation of CF. More than three quarters (82.1%) of the CHVs gave correct response that early initiation of CF before six months poses health risk to the infants. However, only 48.2% were aware that late introduction can lead to poor health status of the infants. Slightly more than half (50.6%) of the CHVs were knowledgeable on consistency of complementary foods. Food variety and feeding during illness stood at 66.7% and 64.9% respectively. However, only a few gave correct responses on amount of food to give at six months (25.6%) and frequency of feeding at 7-8 months (23.8%) (Table 4).

**Table 4: Knowledge of CHVs on CF, (n=168).**

| Knowledge aspect | Correct response | |
|---|---|---|
| | N | % |
| **Time of initiation of CF** | 158 | 94 |
| **Early initiation poses health risks** | 138 | 82.1 |
| **Late initiation leads to poor health** | 81 | 48.2 |
| **CF refers to solid/semi solid food and not liquid food** | 85 | 50.6 |
| **Children 6-23 months are fed 2-3 times with snacks in between** | 81 | 48.2 |
| **Feeding on variety of foods** | 112 | 66.7 |
| **Continued breast feeding for 2/>2years** | 120 | 71.4 |
| **Encouraging child to feed** | 109 | 64.9 |
| **Feeding more during illness** | 109 | 64.9 |
| **Food enrichment** | 118 | 70.2 |
| **Frequency of feeding at 6 months** | 83 | 49.4 |
| **Amount of food at 6 months** | 43 | 25.6 |
| **Amount of food at 7-8 months** | 42 | 25.0 |
| **Frequency of feeding at 7-8 months** | 40 | 23.8 |
| **Frequency of feeding at 9-11 months** | 52 | 31 |
| **Amount of food at 12 months** | 95 | 56.5 |
| **Frequency of feeding at 12 months** | 94 | 56 |

n=respondents who gave correct responses.

An overall knowledge score was calculated based on the total correct responses in each CF practice expressed as a percentage and categorized as low (0-49%), moderate (50-69%) and high (≥70%).[11] Majority of the CHVs had moderate (66.1%) knowledge on CF of children 6-23 months. Those categorized having high knowledge were 23.2% and those with low knowledge 10.7% (Figure 1).

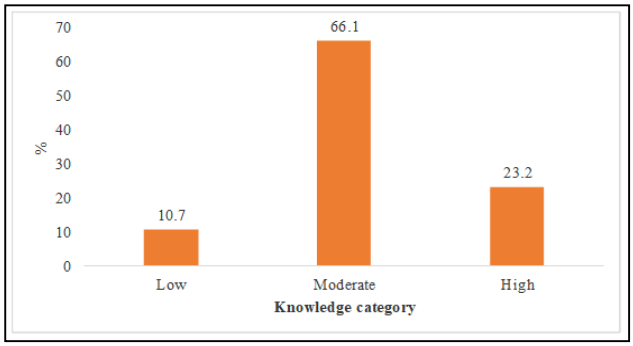


**Figure 1: Knowledge category of CHVs on CF.**
Knowledge category**:** low (0-49%), moderate (50-69%) and high (≥70%).

***Counselling skills of CHVs on CF***

An observation checklist was developed to assess the counselling skills of the CHVs to the caregivers of children aged 6-23 months on CF. Observation was based on the general counselling skills as well as the use of the skills to deliver CF key messages based on age of child. Study assessed CHV during a counselling session with a caregiver and scored the CHV as either 0 (poor), 1 (fair)/ 2 (Good) based on their demonstrated skills.

Only 35.7% were good at creating rapport with the caregivers and requesting for permission to talk to the caregiver with majority (45.2%) being fair. Less than half (36.3%) of the CHVs were good at paying attention to the caregivers but only 18.5% of them probed and encouraged the caregivers well to talk. As regards to the use of positive non-verbal communication, more than half were poor and only 4.2% were good at this skill.

In delivery of key messages to the caregivers, majority (57.7%) of CHVs were poor at explaining to caregivers the amount of food to be given to a child at a particular age as well as the frequency of feeding. Local foods that constitute the seven food groups were explained fairly well by 53% of CHVs. Food thickness and responsive feeding were also among the poorly explained aspects by the CHVs scoring 61.9 and 89.3% respectively (Table 5).

**Table 5: Counselling skills of CHVs on CF, (n=168).**

| Variables | Poor | | Fair | | Good | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| **Counselling skills** | | | | | | |
| Intro and request for permission | 32 | 19 | 76 | 45.2 | 60 | 35.7 |
| Passes friendly remarks (affirmation) | 50 | 29.3 | 92 | 54.8 | 26 | 15.5 |
| Pays attention to caregiver | 27 | 16.1 | 80 | 47.6 | 61 | 36.3 |
| Encourages care giver to talk (probes) | 58 | 34.5 | 79 | 47 | 31 | 18.5 |
| +ve non-verbal communication | 115 | 68.5 | 46 | 27.4 | 7 | 4.2 |
| **Delivery of key messages** | | | | | | |
| Start of CF | 61 | 36.3 | 79 | 47 | 28 | 16.7 |
| Amt of food given | 97 | 57.7 | 51 | 30.4 | 20 | 11.9 |
| Frequency of feeding a breast-feeding child | 97 | 57.7 | 49 | 29.2 | 22 | 13.1 |
| Local food that constitutes 7 foods | 32 | 19 | 89 | 53 | 47 | 28 |
| Food thickness | 104 | 61.9 | 55 | 32.7 | 9 | 5.4 |
| Food enrichment | 91 | 54.2 | 42 | 25 | 35 | 20.8 |
| Hygiene and food safety during feeding | 43 | 25.6 | 47 | 28 | 78 | 46.4 |
| Responsive feeding | 150 | 89.3 | 14 | 8.3 | 4 | 2.4 |
| Recommended changes in appropriate feeding | 84 | 50 | 72 | 42.9 | 12 | 7.1 |
| Explains reason for change | 127 | 75.6 | 36 | 21.4 | 5 | 3 |
| Summary of key issues | 115 | 68.5 | 50 | 29.8 | 3 | 1.8 |
| Skills score | 27 | 16.1 | 141 | 83.9 | 0 | 0 |

***Relationship between CHVs' CF knowledge and socio-economic and demographic characteristics***

The current study observed significant associations between the CHVs' nutrition knowledge and their socio-economic and demographic characteristics. Associations were observed between occupation ($\chi^2$=15.518; p=0.008), education level ($\chi^2$=9.300; p=0.026), source of income ($\chi^2$=9.415; p=0.024) and their knowledge (Table 6).

**Table 6: Asso. between CHVs nutrition knowledge and demographic and socio-economic characteristics.**

| Factors | $\chi^2$ | Df | P value |
|---|---|---|---|
| **Sex** | 3.583 | 1 | 0.071 |
| **Age (years)** | 7.454 | 4 | 0.114 |
| **Marital status** | 7.124 | 3 | 0.068 |
| **Occupation** | 15.518 | 5 | 0.008* |
| **Education level** | 9.300 | 3 | 0.026* |
| **Religion** | 1.019 | 1 | 0.324 |
| **Household size** | 3.139 | 2 | 0.208 |
| **Source of income** | 9.415 | 3 | 0.024* |
| **Averag household income** | 0.119 | 2 | 0.942 |

*Significant association (p<0.05).

**Table 7: Associations between CHVs skills and demographic and socio-economic characteristics.**

| Factors | $\chi^2$ | Df | P value |
|---|---|---|---|
| **Sex** | 0.849 | 1 | 0.350 |
| **Age (years)** | 1.967 | 4 | 0.742 |
| **Marital status** | 4.005 | 3 | 0.261 |
| **Occupation** | 17.400 | 5 | 0.004* |
| **Education level** | 15.835 | 3 | 0.001* |
| **Religion** | 1.062 | 1 | 0.303 |
| **Household size** | 5.124 | 2 | 0.077 |
| **Source of income** | 4.120 | 3 | 0.249 |
| **Average household income** | 4.287 | 2 | 0.117 |

*Significant associations (p<0.05).

Logistic regression (adjusted for variables with p<0.1 at bivariate association) further revealed that those who employed had 1.632 times chance to have poor knowledge in comparison with causal labourers (AOR=1.632, CI; 1.229-8.248, p<0.001). With regards to education, those who had primary education had 3.358 times likelihood of having poor knowledge in comparison with those in college (AOR=3.358, CI; 1.065-10.590; p=0.039). Furthermore, those who reported farming their main income source, 3.5 times likely to good knowledge as opposed to those whose income from casual labour (AOR=3.500, CI; 0.914-13.408; p=0.044) (Table 8).

***Associations between CHVs skills and demographic and socio-economic characteristics***

Chi-square test revealed associations between CHVs skills and their occupation ($\chi^2$=17.400; p=0.004). Significant associations also noted between the CHVs skills and education level ($\chi^2$=15.835; p=0.001) (Table 7).

After adjusting for variables with a p<0.1 at the bivariate association, those in small scale trading were 3.5 times more likely to have fair skills than those in casual labour (AOR=3.500, CI; 0.266-16.045, p=0.034). The study also observed that those CHVs with no education had 12.1 times chance of having poor skills as opposed to those who had college education (AOR=12.1, CI; 5.482-21.950, p=0.040) (Table 8).

**Table 8: Relationship between socio-economic and demographic characteristics of CHVs and knowledge and skills.**

| Category | Knowledge on CF | | |
|---|---|---|---|
| | AOR | CI | P value |
| **Socio-economic and demographic** | | | |
| Occupation (Employed) | 1.632 | 1.229-8.248 | <0.001 |
| Education level (primary) | 3.358 | 1.065-10.590 | 0.039 |
| Source of income | 3.560 | 0.914-13.408 | 0.044 |
| **Skills** | | | |
| Occupation (Small traders) | 3.5 | 0.266-16.045 | 0.034 |
| Education (No education) | 12.1 | 5.482-21.950 | 0.045 |
| **Practices** | | | |
| Counselling on CF (less topics) | 45.429 | 20.468-89.535 | 0.002 |

Knowledge: low (0-49%), moderate (50-69%), high (≥70%)

***Association between CF knowledge and counselling skills of CHVs***

From chi-square test, there was no significant association between the CHV's knowledge and skills ($\chi^2$=0.978, df=1, p=0.390). In order to do cross tabulation of CHVs' knowledge and skills, the knowledge of the CHVs was further classified into good (≥50%) and poor categories (<50%) (Table 9).

**Table 9: Cross tabulation of CHVs' nutrition knowledge and skills categories.**

| Knowledge | Skills, n (%) | | P value |
|---|---|---|---|
| | Poor | Fair | |
| **Poor (<50%)** | 8 (29.6) | 56 (39.7) | 0.390 |
| **Good (≥50%)** | 19 (70.4) | 85 (60.3) | |
| **Total** | 27 | 141 | |

## DISCUSSION

***Training of CHVs on CF of children aged 6-23 months***

More than three quarters (87%) of CHVs were trained on CF. There were, however, variations in reported training duration depending on type of partner supporting the

community units. Majority (67.5%) were trained by NGOs. In her study done in Njiru, Kenya Margaret contradicts the current findings where she stated that more than half of CHVs were trained by MOH.[26] Majority (63.3%) were trained for some hours with only 24.4% being trained for 2-3 days. The training period for most of the CHVs in this study was inadequate to cover all topics in CF adequately. As indicated by Kithuka an initial training period of less than 14 days during recruitment of CHVs was found to be insufficient to cover modules required to adequately equip CHVs for successful execution of their duties.[27] Other studies documented that training in Kenya, Uganda and Tanzania for CHVs took 2-4 weeks which covered health issues in general and not all CHVs received this training.[20,28]

The coverage of the training was further investigated. Nearly a third (26.9%) were trained on types of food to give to children and almost equal numbers were trained on variety and hygiene. Less than 10% of the CHVs were trained on frequency, amount of food and responsive feeding. It was also noted that the training on CF was done without much emphasis on different age groups. Aseyo et al in his study on realities and experiences of CHVs stated a similar situation where each CHV reported different topic areas of training and different lengths and formats of training.[20] Similar findings were observed where only a little more than a third of the CHVs in a Brazilian study on CF reported having received training on CF.[15]

Purvi et al agrees with the findings of the current study.[14] He reported that, CHVs recommended lesser quantity of food for children 12-23 months and only few recommended caregivers to encourage their children to feed through play. According to walker et al complementary training modules and one-off training coupled with refresher training are valuable in building skills and professional advancement.[22] However, they should be allocated adequate time to help build the knowledge base and skills for the CHVs to be able to deliver optimal CF messages. Furthermore, if regular refresher training is not available, acquired skills and knowledge are quickly lost, and that will influence their performance.[20]

### *Knowledge of CHVs on CF*

The knowledge level of the CHVs on CF aspects was moderate (55.7%). This could be because by the time of data collection, several NGOs in partnership with MOH had conducted some training to the CHVs. The CHVs were knowledgeable on the age of initiation of CF and dangers associated with introduction of CF before the age of six months. The observations in this study are similar to findings by Purvi et al on knowledge and perceptions of CHVs on CF where he reported that their knowledge level on CF was average with majority knowing the time of initiation of CF.[14] Other studies that collaborated with this study were conducted by Dos santos et al and Mwoma et al.[15,16] The two surveys analyzed CHVs' knowledge on the feeding of children up to two years of age and verified that the module score based on breastfeeding was higher than the score of CF. Mieke however, stated that CHVs in Kwa Zulu Natal in South Africa thought the initiation of CF was between 4-6 months of age.[17]

The current study also observed that, knowledge on dietary diversity was average (66.7%) as most of the CHVs were not knowledgeable on the amount of food to give at specific age categories as well as the frequency. Other studies reported that CHVs are main source of nutrition information on CF for caregivers, and it is therefore important that the latter have adequate knowledge of infant nutrition especially on amounts and frequency.[16,17]

### *CHVs' counselling skills to caregivers on CF*

For behaviour change to be effective, interpersonal communication and delivery of key messages is vital. Some studies showed that training in communication skills enabled CHVs to promote behaviour change in the community and increased their confidence in healthy behaviour.[18,19] From our study, the counselling skills' mean score of the CHVs was 0.84 (SD=0.368). The CHVs were either poor or fair with majority (83.9%) being fair ranked on a scale of poor (0), fair (1) and good (2). Some of the fair counselling skills observed were: creation of rapport with caregivers, paying attention to caregivers and encouraging them to talk.

Use of non-verbal communication was poorly done. Similar studies on CHVs have mentioned few counselling skills, only few mentioned roles modelling and rapport-building.[20,21] CHVs being known to the community members could to some extend create fair environment for communication to the clients although more skills are still required in this area. Mwoma et al collaborates with our study where she found that CHVs knew the need to create rapport before counselling sessions.[16]

In delivery of key messages on CF, local foods that constitute the seven food groups was explained fairly well by 53% of the CHVs. Amount of food to give, frequency, food thickness and responsive feeding were poorly explained to caregivers. Other studies have agreed with this study by reporting that, only 33% of CHVs mentioned frequency, quantity and consistency of CF.[14] Other studies attest that if CHVs are given the right skills and communication materials, they can help in reducing the risk of malnutrition in young children.[21] A minimum standard for continuing education should be established to ensure CHVs retain competencies and advance in new skill development.[22]

### *Content coverage during counselling of caregivers on CF*

Our study further investigated the topics covered on CF during nutrition counselling. Food variety and food

hygiene were mostly discussed by the CHVs during nutrition counselling. The least discussed were those on food preparation and on responsive feeding. Amount to feed to children, frequency of the feeds and food thickness were also not adequately covered. The findings of the current study contradict a study done in rural Kenya on CHVs counselling where caregivers reported that CHVs taught them how to feed their children little by little through giving different foods.[16] In research by Keding et al CHVs participated in counselling caregivers on food diversification in preparation of complementary foods.[23]

***Relationship between knowledge and socio-economic and demographic characteristics of CHVs***

There was a significant association ($p<0.05$) between knowledge and socio-economic characteristics (Occupation, education and source of income) of the CHVs. Those employed were 1.63 times likely to have poor knowledge contrary to casual labourers. This could be attributed to fact that those employed are more committed to the job and may not have adequate time to attend refresher training and hence the low knowledge level. Likewise, the CHVs attaining primary school education level were 0.358 times likely to have poor knowledge compared to those whose education level was up to college. Those with higher education background will have better understanding of concepts during training and this will translate to higher knowledge of content.[25]

This current finding concurs with that done in Brazil on CHVs as interlocutor of CF which indicated that those who had elementary secondary education and above had high knowledge on CF compared to those with low level of education.[15] More education impacts positively on CHVs performance.[24] Education background should therefore be a key consideration during recruitment of CHVs.

CHVs who were farmers from the group had 3.5 times likelihood of having good knowledge in comparison with casual labourers. Although no much literature explaining the reason for this, it is likely that farmers are self-employed and responsible of their farms and can therefore create time for themselves and attend CF refresher trainings which were noted from this study that they take 1-3 days or few hours. Casual labourers on the other hand may not predict when they will get a job which may be based on luck and therefore miss out on the CF refresher trainings if the job comes up. Other socio-economic and demographic characteristics did not have significant association with the knowledge of CHVs.

***Limitations***

The study focused on training, knowledge and skills of CHVs on CF of children aged 6-23 months and did not evaluate the actual CF practices of care givers of children in this age group. The factors affecting the effectiveness of the CHVs in counselling caregivers on CF was also not evaluated. Further research is recommended to study these factors.

## CONCLUSION

From the current study findings, it is notable that majority of the CHVs receive inadequate training on CF and refresher trainings are rarely conducted if any. The training duration and content is also inadequate to equip the CHVs with right knowledge on CF.

This study rates the knowledge of the CHVs as moderate and concludes that it is sub-optimal to promote appropriate CF within the community they serve. Counselling skills' score indicated that CHVs possessed fair skills implying that they lack some practical skills to execute their duties. This was not only for the general counselling skills but also on delivery of CF key messages to caregivers. Concerted efforts from both MOH and partners in health is therefore required to ensure the existing curriculum on community strategy is reviewed to include adequate information of CF, counselling skills and also provide MIYCN counselling cards for all the CHVs. Existing policy on community strategy should also be reviewed to put in place modalities by which CHVs can be motivated.

From our study, a strong link was noted between CF knowledge of CHVs and their occupation, education level and source of income. This implies that that some level of education and an income generating activity are important considerations in CHVs' recruitment as they will affect their understanding and retention of CF concept and also affect their frequency of household visits.

This study found that, there was no association between CF knowledge and skills among the CHVs an indication that CF knowledge does not always translate to skills and therefore a detailed training on skills should be included in the training curriculum for CHVs.

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