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Assessment of nutritional security, utilization of locally available foods and knowledge on balanced diet: *"The evidence from Songwe region in the Southern high-lands of Tanzania"*

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ABSTACT
The present study assess the gap in nutritional security knowledge by looking on some set indicators such as knowledge on balanced diet, food utilization habit and presence of home garden as a cheap and easy access to nutritious food at household level. A quota sampling technique was used to obtain 12 villages out of 18 within the Songwe District. A sample size of 456 households was obtained using systematic random sampling method. Both structures questionnaire and cheque list were used to gather information on food utilization habit, knowledge on balanced diet availability of home garden. About 57.7% of the interviewed households' representative was female and 42.3% male. Level of knowledge on balanced diet indicated 16% scored excellent, 12.7% good, 23% average, 15.8% poor and 32.5% failed based on the Likert scale of 1-5 (Fig. 1). It was also found that there is limited vegetable home garden and fruit trees which could make nutritious food affordable and accessible at household level as indicated in Table 2 &4 below. There is also inadequate consumption of vegetable and fruits as nutritionally enriched foods among the surveyed households as shown in Table 3 and 5.

1. INTRODUCTION

Food and nutrition knowledge has become particularly important in low-income countries, including Sub-Saharan Africa where numerous findings have shown that a lack of Food and Nutrition knowledge contributes to malnutrition (Debela, B., *et al*, 2017). This association becomes even more dramatic in vulnerable population groups, including women of childbearing age (CBA), who have increased nutritional requirements for appropriate foetal programming and development, besides their health (Fadare, O *et al*, 2019; Kimani, E, 2015). Inadequate Food and nutritional knowledge in community especially women at reproductive age places their future and that of their offspring at risk of nutrition-related chronic diseases. Never the less access to healthy and nutritious food is an enabling factor for realizing the Sustainable Development Goals (Goal No.2) for a more equitable and resilient futures for developing countries like Tanzania. Moreover, malnutrition in childhood and pregnancy has many adverse consequences for child survival and long-term well-being. It also has far-reaching consequences for human capital, economic productivity, and overall national development. The consequences of malnutrition should be a significant concern for policymakers in Tanzania, where 32 percent of children under- five years are stunted (have low height-for-age) and 58 percent suffer from anaemia, according to the Tanzania National Nutrition Survey reports (2018) and the most recent Demographic and Health Survey (DHS 2016). According to the new, 2018 UNICEF-WHO classification, the level of stunting was considered "very high" (≥30%) in Tanzania Mainland in 15 regions out of 26 including the study area). Besides the fact that Southern Highlands of Tanzania is considered as a Countries' food basket, the level of malnutrition is high above UNICEF-WHO threshold. The most affected regions with a prevalence of stunting exceeding 40% were: Ruvuma (41.0%), Iringa (47.1%), Rukwa (47.9%), Kigoma (42.3%), Njombe (53.6%) and Songwe (43.3%) (USAID, 2021).The situation of food insecurity is made worse by poor feeding practices leading to poor nutritional status (FAO, 2017). Among the key indicators used to assess the nutritional food and nutritional awareness in the study area was the presence of vegetable home garden and fruit trees. A home garden consists of a small area used for cultivation near the household which provides easy access to vegetables and fruits. Proximity of gardens to the home facilitates easy access to food and reduces household expenditure (Pillai, A et al., 2016). Home gardens combined with nutrition education could improve household diets both quantitatively and qualitatively (Pillai, A et al., 2016). The presence of foods alone doesn't translate into an optimal dietary intake. However the choice of what, how and when to eat are governed by several factors of which nutritional literacy is among the top (Bundala, N., et al, 2020). Feeding practices are also sub-optimal with only 30% of the children below five years of age are fed the minimum acceptable diet (Tanzania National Nutrition Survey Reports, 2018).

2. METHODOLOGY

i. Description of the study area

Songwe District is among the four districts of Songwe region in the Southern Highlands of Tanzania. Administratively, Songwe district is divided into 2 divisions and 18 wards which are further subdivided into 43 villages. The area of Songwe is about 16,070KM^2 with the total population of 1,344,687 out of which 701,008 are female according to the 2022 Tanzania National Census. The study was conducted in the selected 6 wards namely Kanga, Galula, Magamba, Chang'ombe, Mbuyuni and Totowe in 2021.

ii. Sampling procedures

Quota sampling technique was used to obtain 6 wards out of 18 where 2 villages were sampled in each of the 6 wards making a total of 12 villages. The section criteria were primarily based on those villages where there is food security challenges and major economic activity being small scale farming. Systematic random sampling was used to obtain sample of 38 households for interview from the village Government list of households to make the sample size of 456 households. The selected villages are Tete, Kanga, Ilasilo, Ifuko, Itindi, Chang'ombe, Mbuyuni, Mwagala, Namambo, Totowe, Nahalyongo and Songambele.

iii. Data collection

Both structured questionnaire and cheque list were used to obtain information on household characteristics, home gardening practices, food consumption habits, as well as knowledge and attitudes on balanced diet. Cheque list was used to interview Focus group Discussion (FGD) to complement the information. The household heads were the target respondents (father or mother) and in case of absence, another permanently adult resident (> 18 years) in the households took part in the interview.

iv. Data analysis

The collected data were coded and analysed using IBM (SPSS) version 26. Descriptive statistics techniques as frequencies and percentages were used to analyse the data.

3. RESULTS

a. Gender of the respondents

The issue of gender is among the variable of interest in this study. The result showed that 57.7% were female and 42.3% were male (Table: 1) .Since this study focus on household food and nutritional knowledge, women have the greater role to play because they are key players in family management.

Table 1: Gender of the respondents			
Variables	Frequency	Percent	Valid Percent
Male	193	42.3	42.3
Female	263	57.7	57.7
Female	263	57.7	57.7
Total	456	100.0	100.0

b. Level of understanding of balanced diet

The level of understanding was assessed using a Likert Scale of (1-5) where 1=Excellent, 2= Very good, 3=Good, 4=Poor and 5=Failed. The respondents were asked to list the five categories balanced diet and examples of food type in each category. Respondents who were able to list all five categories and their examples correctly were given scale 1 (excellent) while those missed completely were given a scale 5 (failed). (Fig.1) .In terms of percentage 16% scored excellent, 12.7% good, 23% average, 15.8% poor and 32.5% failed.

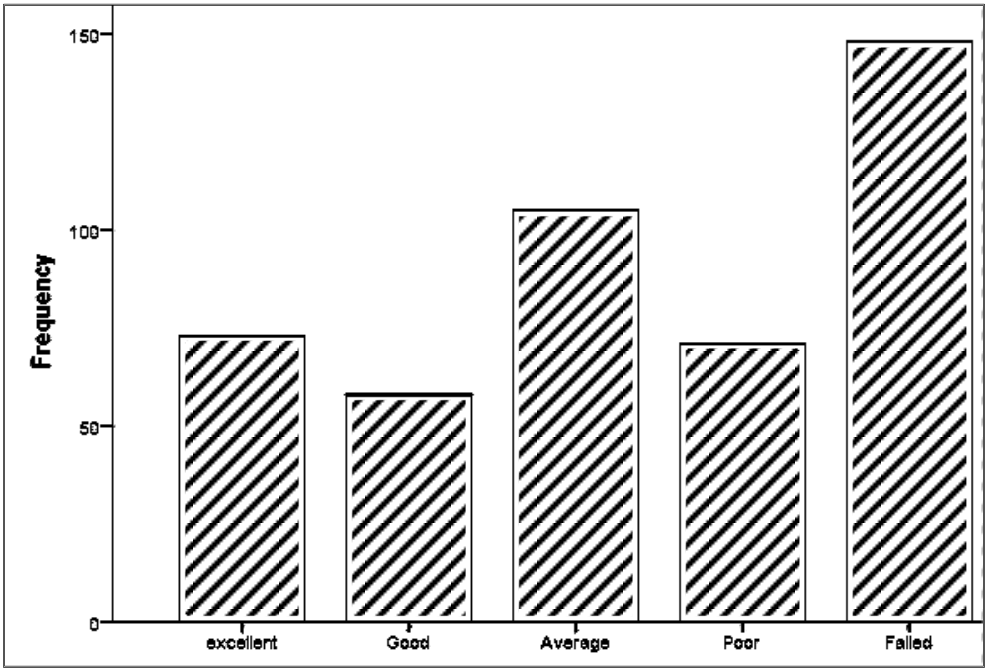

Fig 1: The respondents' level of knowledge on balanced diet.

c. Growing vegetable home garden

Although the area is renowned with fertile lands which support cultivation of varieties of vegetable, most of the community members don't have vegetable home garden. Only 15.1% of the interviewed households have the vegetable home garden while 84.9 don't have (Table: 2)

Qn. Do you have home vegetable garden?	**Table: 2 Availability of vegetable home garden**				
	yes	**69**	**15.1**	**15.1**	**15.1**
	No	**387**	**84.9**	**84.9**	**100.0**
	Total	**456**	**100.0**	**100.0**	

There are various reasons given by the respondent as the hindering factors for not growing vegetable garden. 54.5% of the respondent claimed drought, 20.2% livestock destruction, 10.1% pest and disease and 15.2% claimed other challenges like limited time to take care the garden, high management cost and thieves.

d. Frequency of vegetable consumption

On top of the normally grown vegetables, also there are plenty of edible indigenous vegetable such as amaranth (*Amaranthus hypochndriacus* and *Amaranthus hybridus*), black nightshade (*Solanum nigrum*) and spider plant (*Cleome gynandra*) which just grow in the field without being cultivated. However, it was found that there is inadequate rate of vegetable consumption in their daily meal as nutritionally required. Only 15.6% take vegetable daily while 75.2% take less than three times in a week and 9.2% at consume at least three times per week though not daily (Table :3). Fruits and vegetables are important component are important component of a healthy diet and, if consumed daily in sufficient amounts could prevent major diseases such as cardio vascular (CVDs) and certain cancers (WHO; FAO, 2004); and recommended the daily intake of at least 400g. During the focused group discussion, when they were asked whether they know indigenous vegetables and the interviewer demonstrated some samples of fresh vegetables, most of them know amaranth and very few know about black nightshade and spider plant as edible vegetable. Likewise very few consume because they consider those indigenous vegetable as feed for rabbit and goats.

e. Home fruits garden

Like in the case of vegetables, there is also inadequate home fruits garden (trees). The fruits trees taken in account in this study is either matured one which bears fruits or immature one in order to understand the level of understanding and consciousness towards nutrition as a health engine. However it was found that only 36.6% 0f the surveyed households have the home fruits garden (trees) while 63.4% don't have as indicated in Table.3 below.

Table 3: Frequency of vegetable consumption per week

	Variable	Frequency	Percent	Valid Percent
Qn. ***How many times do you consume veggies per week?***	1. At every meal	71	15.6	15.6
	2. At least three times per week	42	9.2	9.2
	3. ≤ three times per week	343	75.2	75.2
	Total	456	100.0	100.0

f. Fruit consumption

There is also inadequate consumption of fruits as recommended. Only 3.7% of the respondents consume daily, 17.4% at least three times per week and 78.9% consume less than three times in a week (Table: 4); the major reasons given during focused group discussion being drought and seasonal supply of fruits in the market.

Table 4: Frequency of fruits consumption per week

	Variables	Frequency	Percent	Valid Percent
Qn. How often do you consume fruits in a week?	Consume daily	17	3.7	3.7
	At least 3 times a week	79	17.4	17.4
	≤ 3 times a week	360	78.9	78.9
	Total	456	100	

4. CONCLUSION

This baseline study was emanated from various reports on Tanzania nutritional profile for instance Tanzania National Nutrition Survey (2018) and USAID (2021) where the quencequences of malnutrition is a serious concern especially in the southern part of the country besides the fact that these areas produces almost 49% of the National food supply. Besides various initiatives and working policy papers still the ambition of ending hunger by 2030 according to Sustainable Development Goal's (SGD) specifically SDG 2 targets is in vague. Low access to food, high nutritional needs, the Agricultural productivity gap, poor food utilization and vulnerability to the environmental shocks confront the country's rural population which is estimated to be about 67% of the entire population. Thus there is a need of serious attention to address these challenges especially in the developing countries like Tanzania.

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Conclusion

Although a conclusion may review the main points of the paper, do not replicate the abstract as the conclusion. A conclusion might elaborate on the importance of the work or suggest applications and extensions. Authors are strongly encouraged not to call out multiple figures or tables in the conclusion—these should be referenced in the body of the paper.

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