

Home Economics education training as a panacea to COVID-19 impact on food access and nutrition among rural families in Northern Nigeria

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Abstract

Conflict, environmental and climate shocks are known to be the major drivers of acute hunger and food insecurity in Northern Nigeria. Unfortunately, from 2019 to 2020, the COVID-19 pandemic had compounded this situation by slowing down the food distribution and supply chain to the vulnerable families' world over, especially women, children and the aged, due to government measures in curtailing the spread of the pandemic. This situation resulted in a serious food and nutrition crisis among families. To ameliorate the crisis, this study demonstrated a strategy that used Home Economics education skills training that focused on food production, such as kitchen garden establishment and food waste reduction skills to rural women in Sangere community in Girei Local Government Area of Adamawa State, Nigeria. The practical skills training lasted four weeks of eight sessions. A cross-sectional design approach was adopted for this study due to time constraints, using a single-system design of pre-and post-training survey. A total of 30 respondents out of the 53 women who normally attended the monthly nutritional talk at the community clinic were purposively sampled. T-test statistic of post-training data analysis revealed significant improvement in the knowledge of women on the benefits of kitchen garden establishment ($p = 0.000$, $p < 0.05$) and food waste reduction ($p = 0.001$, $p < 0.05$). Post-training experience of women supported the benefits of the kitchen garden as it served as a source of families' supplementary income, provided a diversity of fresh fruits and vegetables. It also provided direct access to food and contributed to food security. Post-training experience of women also supported benefits of food waste reduction in areas of more savings, encouraged re-use of leftovers food, bettered food portioning, ensured food preservation, promoted self-life and, thus increased the food access that met family food demand for better nutrition innovation during the period under investigation. This study, therefore, recommended that policymakers should support the establishment of kitchen gardens, and the promotion of food waste reduction awareness campaign in rural communities through the partnership between food-related professionals, Government and Non-Governmental agencies.

KEYWORDS: HOME ECONOMICS EDUCATION SKILL TRAINING, KITCHEN GARDEN AND FOOD WASTE REDUCTION, FOOD ACCESS AND NUTRITION, RURAL FAMILIES, COVID-19

Introduction

The disruption by COVID-19 on the food supply the world over is alarming. World Bank Report (2020) has estimated that over 88115 million people would be subjected to severe poverty and hunger globally. The majority of these populations are from sub-Saharan Africa where Nigeria belongs. World Food Programme (2020) also reported that about 135 million people were in acute hunger due to poor food access before the COVID-19 crisis started globally and that African people were the worst hit. Several studies have revealed a negative impact of the pandemic on food supply and access. For example, Otekunrin and Otekunrin (2020) reported that COVID-19 pandemic measures disrupted food supply globally. More so, the pandemic has generally undermined families' access to food and

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nutrition security (Amjath-Babu et al., 2020; Barrett, 2020; Bene, 2020; Torero, 2020). Poor rural people in developing countries anticipated suffering more risk of food crisis than developed countries due to their low capacity to adapt and cope (FAO, 2020)

Families in northern Nigeria are already in shortage of food because of the capacity to produce and access sufficient food due to the activities of banditry, Boko Haram insurgency and kidnapping that have disrupted the region over the past ten years. These negative developments coupled with COVID-19 have put the region at a high level of poverty, poor food access, hunger and poor nutrition (Fudjumdjum et al., 2019). It is a bad situation that had already provided a setback for Sustainable Development Goals (SDGs) whose focus is on poverty, zero hunger and good health and wellbeing of individuals and families. Exacerbating this condition is the COVID-19 pandemic's government measures in curtailing the spread of the virus which have compounded the situation by slowing food distribution and supply chain (Babatunde, 2020). These measures have negatively impacted the vulnerable people's access to food, especially the poor, women, children and the aged.

Lockdown was the COVID-19 control measure introduced in all the states in Nigeria. This significantly restricted movement of goods and services. The negative impact of such measure on a family's income, food preparation, distribution, purchase, food access and consumption was unprecedented (Leone et al., 2020). This is an indication that COVID-19 is wreaking havoc on every nation all over the globe with a potential impact on food supply disruption. The situation is leading to looming food waste with its devastating crises on food and nutrition security (Goodwin & Larsen, 2020). COVID-19 had also provided a setback to the world's progress in meeting the SDG Goal 2 agenda. This Goal seeks to "end hunger, achieve food security and improved nutrition promote sustainable agriculture." (United Nations, n.d.). In reversing this setback, Malpass (2021) suggested that countries should be prepared for a kind of post-COVID-19 economy that allows skills, innovation and capital labour to bring new ideas and support food production, new sectors and businesses. Meeting the SDG 2 agenda requires sustainable access to nutritional food that universally demands sustainable agricultural practices that support food production sustainability. This situation has clearly shown that families both in rural and urban locations are in the difficult situation of food accessibility and should therefore be prepared to engage in practices that would ensure food production for all members at this critical time and beyond.

Measures taken by governments to curb the spread of COVID-19, such as staying at home, lockdowns and movement restrictions, have provided good opportunities for Home Economists to exhibit their skills by assisting families and communities to undertake deliberate actions and responsibilities to solve food nutrition and health problems through reinforcement of appropriate nutritional training to ensure seamless food access and good nutrition. When families are exposed to this practical skills training and services that demonstrate areas of need like food, it motivates families to positive change in action and attitude and equally makes them sensitive to their nutritional needs and practices. Nutrition is important for the overall wellbeing and development of individual and families (McNulty, 2013). Providing nutrition promotion education that supports low-income families the world over will assist in providing and eating healthy food for the benefits of good health and survival (Kapur, 2019). Food and nutrition education is a component of Home Economics education (McGregor, 2019b). Home Economics, therefore, is the vehicle that drives this study. Home Economics education focuses on equipping individuals and families with skills and knowledge that can help cope with food security and nutrition problems (Olumakaiye et al., 2019). More importantly is Home Economics role in improving food security and health (McGregor, 2019b; Tach, 2019), supports for poverty reduction, family health and national development (Degala, 2018; McGregor, 2019a).

Interventions of the Home Economics professionals to act in line with the objectives of Home Economics education at the improvement of family nutrition and welfare is a good option for food security (McCloat & Caraher, 2016). Food availability could reduce hunger as zero hunger is one of the targets 2 of SDG 2030 (United Nations, 2017). The focus of Home Economics education in addressing this life and practical skills that can empower families to have good knowledge of food production, sustainable diet, food storage and preservation; as well as hygiene and health which aim to improve wellbeing and quality of life for individuals and families through the provision of food to avert nutrition security (McCloat & Caraher, 2016; McGregor, 2019b).

Today's families are being challenged globally with social and health crisis since the advent of COVID-19. This has brought more attention to the importance of women in the families since all crises that fall on families affect women the most and because women are the mothers of families, they also

bear more of the brunt presented by any crisis. Women's continued responsibility of caring, preparing and producing food for all members of the families even during crises added to reasons for their vulnerability. Any crisis that disrupts family income disrupts food access and equally affects family nutrition (Gundersen & Ziliak, 2015). This is an indication that the COVID-19 outbreak has high impact risks that have very negative effects on income, food access and nutrition of families. This calls for greater attention and intervention by all and sundry.

Nigeria government has taken steps in providing several interventions such as food palliatives and cash transfers, among others, during the lockdown to the populace. Such interventions are said not to have got to people in rural communities, especially the women (Badejo et al., 2020). This situation raises the need to look into other actions or strategies that can deal with food access issues and nutrition security during crises like this. According to Olumakaiye et al. (2019), any actions that empower women to access food will reduce hunger and improve food and nutrition security within families. This is so because any strategies that support family income are expected to provide good opportunities for sustainable food production and access and encourage quality food consumption for better family nutrition (Fresco et al., 2017). The pandemic is not just about health alone; it also poses an economic and nutritional challenge that requires multifunctional approaches to deal with (FAO, 2020). One of such approaches is the use of Home Economics skills training to educate rural people, specifically women, who account for much of the food preparation responsibilities. The skills focused on the strategies that can improve family income and food access for their nutritional security.

Home Economics skills training which this study focused on are kitchen garden and food waste reduction skills. Several studies have supported the need for food access through the engagement of families in food production during food crises. For example, the study of Otegunrin and Otegunrin (2020) encouraged practices that ensure sustainable food production amidst the COVID-19 pandemic. Galhena et al. (2013) supported organising self-help training in areas of kitchen gardens and any good actions that can help rural families raise better income that supports the promotion of food production for improving nutrition security. Food waste reduction and prevention promotion should be the responsibility of all actors and professionals in the food-related field because it creates an opportunity for food access to all (Galli et al., 2019). Training in the kitchen garden and food waste reduction at this time of the COVID-19 pandemic, when family food access is disrupted, is a good alternative for production and consumption.

Kitchen garden skill training and family's food access and nutrition

The kitchen garden is defined as a garden where food such as herbs, fruit and vegetables are grown within the family compound. The kitchen garden provides families with an opportunity to produce foods varieties that are accessible, healthier and fresher for their consumption and nutritional needs. The need for kitchen garden skill training during crises situation like COVID becomes necessary and should continue beyond the COVID-19 pandemic for better nutrition and health. Also, more food production is necessary for the ever-growing global population as the world population by 2050 is expected to reach 9 billion and above (United Nations, 2019). The implication of this statement in terms of food access and nutrition security to families is great, and if nothing is done to encourage food production, the world will be in for serious food crises. It will also bring setbacks to SDG target 2030, which is less than ten years ahead. Families in developing countries with poor access to food are expected to identify strategies that can create opportunities for food production and access to meet the demand for better nutrition. Food shocks and higher food prices due to COVID-19 control measures call for interest in providing effective action and strategic measures to local food production for families (Badejo et al., 2020). One of such actions is women's engagement in the kitchen garden (Musotsi et al., 2008). According to Suri (2020), any action that promotes nutrition gardens that can ensure improved income, food access, and dietary diversity will also provide sustainable nutrition for families and that any of such actions should be encouraged.

Previous studies of Galhena et al. (2013) and Rybak et al. (2018) found that when families participate in kitchen gardening, it leads to food access and improve nutrition. For instance, according to Galhena et al. (2013), a kitchen or home garden is seen to have played and provided strong economic values to food access that benefits family nutrition in crisis and post-crisis situations. Conducting practical skill training in kitchen gardening for rural families is expected to promote fruit and vegetable production which are the major sources of protective foods that are fresh and close to the backyard of families. The kitchen garden is not just to provide access to food but also ensures that

fresh fruits and vegetables are eaten for better nutrition (Arya et al., 2018; Suri, 2020). Consumption of fruits and vegetables helps to improve the body's immune system (Rybak et al., 2018) and people with high immunity tend to have higher resistance to the attack of COVID-19 (Aman & Masood, 2020). Kitchen garden promotion enhances food and nutrition securities (Birdi & Shah, 2018; Rybak et al., 2018). More so, the kitchen garden contributes to family food access and improves food security (Carney et al., 2014). Engaging in activities of this nature are sure ways to encourage rural women to participate in food production that can promote family immunity against COVID-19 and beyond.

Food waste reduction skill training and family's access to food nutrition

Food waste is food that is left without eating. This might be because foods that are appropriate to be consumed by humans are being discarded. The major causes of food waste are numerous and mostly occur during production, distribution, processing, retailing, and consumption. It occurs when food is kept to expire or allowed to spoil. Whatever the reason might be, the training skill that involves food waste reduction such as drying, pickling, fermenting, canning, freezing and curing aimed at making the food last longer during health crises situation like COVID. It equally brings about responsible production and consumption captured as Sustainable Development Goal 12 that is meant to ensure better use of resources and infrastructure sustainability which are expected to be achieved by 2030 (United Nations, 2017).

Food waste reduction improves food access (Sewald et al., 2018). Food waste is a major societal nutritional challenge to families globally (Halloran et al., 2014). COVID-19 has come to decrease global food access further and increase demand for food. To meet this increase in food demand, skills that can reduce food waste are better alternatives. This is because food waste reduction, prevention and promotion of awareness are critical and must be the responsibility of all actors in the food-related professions to ensure its prevention or reduction (Galli et al., 2019).

Food waste is said to be pronounced more in developing countries (Thi et al., 2015) and Nigeria, being a developing country, is not an exception to ugly this situation. This is particularly due to the poor attitude and skills of families in rural communities with their poor preservation facilities (Gebre & Gebremedhin, 2019).

Previous studies reported the benefits of food waste reduction to families. For instance, Shaw et al. (2018) stated that it ensures more savings to families; promotes self-life of foods (Devaney & Davies, 2017; Quedsted et al., 2011); encourages re-use of leftovers food (Reynolds et al., 2019); increases food access (Thyberg & Tonjes, 2016), and ensures food preservation skills for nutrition innovation (Byker et al., 2014; Visschers et al., 2016). Food preservation is a good way to food waste reduction as it increases foods availability and promotes self-life and, thus increases food access. Preserving perishable and non-perishable foods ensures yearly food availability, adds variety to the family diet, saves energy and time along with food price stability, access, consumption, and decreased nutrition inadequacies (Gebre & Gebremedhin, 2019; Malcolm, 1944).

Statement of the problem

This study targeted rural women simply because, in most communities in Northern Nigeria, women's roles are significant in terms of food production and preparation, resource management, family care and income generation activities despite their lower income, social status, less access to education and training. Any training that enhances and empowers women to generate more income to enable them to access food for better family nutrition becomes inevitable for family development and survival (Quisumbing & Meinzen-Dick, 2001). Food access and nutrition problems in northern Nigeria have not been critically and adequately analysed and solved despite various efforts of government at various levels to address these challenges but without success (Matemilola & Elegbede, 2017).

More so, COVID-19 has added more burdens to food access and nutrition (Babatunde, 2020). For the food crisis resulting from this pandemic to be ameliorated, all governments implemented policies and programmes on COVID-19 such as cash transfer and school feeding must be backed by individual and community actions to reduce and address the negative impacts of the pandemic on food access and nutrition among rural families. These actions and strategies are expected to be provided through Home Economics skills training, specifically in areas of the kitchen garden and food waste reduction. This study therefore designed to provide a fundamental change in attitude and strategies using the approach of Home Economics skills training on all modalities that can promote family income for

better food access and also to effectively address the problems of food nutrition insecurity among rural families while obeying all the COVID-19 preventive measures. The skills training provided clear strategic actions that assure food access components (physical, economic, and sustainable access) that will in turn support and ensure improved nutrition and other conditions that bring about nutrition security during this COVID-19 pandemic and beyond.

Objectives of the study

This study was aimed at assessing Home Economics education skills training as a panacea to COVID-19 impact on food access and nutrition among rural families in Northern -Nigeria. Specifically, it aims at examining the impacts of:

1. Home Economics skills training on the benefits of the kitchen garden to rural families' food access and nutrition
2. Home Economics skills training on the benefits of food waste reduction to rural families' food access and nutrition.

Research questions

The study sought to answer the following research questions

1. What are the impacts of Home Economics Education skills training on the benefits of the kitchen garden to rural families' food access and nutrition?
2. What are the impacts of Home Economics Education skills training on the benefits of food waste reduction to rural families' food access and nutrition?

Hypotheses of the study

The study is further guided by two null hypotheses stated and tested at 0.05 alpha levels as follows:

- Ho₁. There is no significant difference in the mean response score of women on the benefits of kitchen garden pre and post-skills training.
- Ho₂. There is no significant difference in the mean response score of women on the benefits of food waste reduction pre and post-skills training.

Methodology

A cross-sectional approach was adopted for this study due to time constraints, using a single-system design of pre-and post-survey. Due to resource constraints and time, Sangere Community, in Girei Local Government Area (LGA) Adamawa State, Northern Nigeria was chosen for the study. Respondents were women who were made to attend nutritional training programmes at the Sangere community LGA Clinic. The appropriateness of this design is due to the short duration of the study. Also, the community had been under the study of the researcher on a repeated basis almost for two years; therefore, a cross-sectional design in which respondents were surveyed with a defined food access indicator was considered to be in order.

The population consisted of all the 53 women who normally attended the monthly nutritional talk at the Sangere community clinic. A total of 30 respondents that volunteered and consented to participate were selected for this study using the purposive sampling technique. The questionnaire was divided into two sections, with section one having five items that deal with the benefits of kitchen garden while section two contains five items on the benefits of food waste reduction to family food access and nutrition security. The 5-point Likert rating scale with values 5, 4, 3, 2, and 1 of *Strongly Agree (SA)*; *Agree (A)*; *Undecided (U)*; *Disagree (D)*; and *Strongly Disagree (SD)* assigned respectively was used to answer the two research questions. *Mean* points of 3 and above were said to be agreed and beneficial while the mean response point of less than 3 points was said to disagree and not beneficial. The two null hypotheses were tested using *t*-test statistics and that when the *p*-value is greater than the 0.05 level of significance, the null hypothesis is rejected, otherwise the null hypothesis is retained.

Home Economics education skills training procedure

Before the commencement of the training, pre-survey information on the respondents' knowledge on kitchen garden and food waste reduction were obtained. The training manual adapted for this study was from the Center for Sustainable Development (2020), OL 303. Areas of skill training interventions included practical skills on kitchen gardens establishment with a strong emphasis on fruit and vegetable gardening skills. The training for kitchen garden skills lasted for four sessions in two weeks while that of food waste reduction skills training with special training on food storage and preservation along with the skills on how to use leftover foods lasted for two weeks involving four sessions, all in December 2020. The training was carried out with the aid of three trained research assistants who assisted in the coordination of all training activities under strict COVID-19 measures.

Table 1 reveals the mean response of respondents on the impact of Home Economics skills training on the benefits of the kitchen garden to family food access and nutrition. The weighted mean response scores of all the items were 1.52 pre-training and 4.30 post-training with a mean response score difference of +2.78. The post-training mean response is 4.30 implying that the training had improved the knowledge of women on the benefits of the kitchen garden to families. T-test statistic shows a p -value of 0.000 which is less than the alpha level of 0.05, indicating the existence of significant differences in pre and post-skill training.

Results

Table 1 Respondents' mean response on the benefits of kitchen gardens to families

Variables	M before training	M after training	M Difference
Kitchen garden is principle source of families' supplementary money or income for poor rural Families	1.45	4.56	+3.11
Kitchen gardening direct access to food and contributes to food security during periods of food crises and stress	1.65	4.65	+3.00
Kitchen garden provides diversity of fresh fruits and vegetables that improved quantity and quality of nutrients to families	1.86	3.78	+1.92
It creates opportunities for food production and access to meet family food demand for better nutrition.	1.21	4.57	+3.36
Kitchen gardens combined with nutrition education is a viable strategy in improving the nutritional status of vulnerable populations, particularly women and young children.	1.43	3.9	+2.47
Weighted mean	1.52	4.3	+2.78

Decision: Weighted mean of 3 and above *Agreed and beneficial*, less than 3 is *Disagreed and not beneficial*, $p = 0.00$ (significant at $p < 0.05$). T-test interpretation is significant.

Table 2 results show the mean responses of respondents on the impact of Home Economics skill training on the benefits of the food waste reduction to family food access and nutrition. The weighted mean responses of all the items were 1.96 pre-training and 4.53 post-training with a mean response difference of +2.57. Post-training mean response scores of 4.53 imply that the training had improved the knowledge of women on the benefits of food waste reduction to families. T-test statistic shows a p -value of 0.001 which is less than the alpha level of 0.05, indicating the existence of significant differences in responses of pre and post-skills training.

Table 2 Respondents' mean response scores on the benefits of food waste reduction to families pre and post skills training

Variables	M before training	M after training	M difference
Food waste reduction ensures more savings as the amount of money wasted on food is reduced	2.45	4.61	+2.16
It encourages re-use of leftovers food and portioning	2.65	4.76	+2.11
Food waste reduction through food preservation is a good way to increase food availability and thus increases the food access	1.81	4.67	+2.86
Food waste reduction skills training improves food access and nutrition innovation	1.26	4.51	+3.25

Variables	M before training	M after training	M difference
It ensures food sustainability	1.65	4.1	+2.45
Weighted mean	1.96	4.53	+2.57

Decision: Weighted mean of 3 and above *Agreed and beneficial*, less than 3 is *Disagreed and not beneficial*, $p = 0.001$ (significant at < 0.05). *T*-test interpretation is significant.

Discussion of findings

The findings of this study revealed that Home Economics education skills training had significantly improved knowledge of women on the benefits of a kitchen garden for families. It is an indication that participants had agreed to have acquired skills for the kitchen garden established which is expected to benefit the families in terms of food access and nutrition security. It also means that the training beneficiaries became more equipped to continue engaging in practices that support kitchen garden establishment. Based on these findings, the null hypothesis which states there is no significant difference in the mean responses score of women on the benefits of kitchen garden pre and post-skills training are therefore rejected.

This is an indication that the post-training experience of women supports kitchen garden establishment due to its benefits such as serving as a source of families' supplementary income, providing direct access to food and contributing to food security during periods of food crises and stress. This finding suggests that the training provided a diversity of fresh fruits and vegetable for participants who are meant to improve the quantity and quality of nutrients and equally creates opportunities for food production that can meet family food demand for better nutrition. The training serves as a viable strategy in improving the nutritional status of vulnerable populations, particularly women and young children. The benefits of kitchen garden found in this study are in agreement with the findings of Arya et al. (2018); Birdi and Shah (2018); Carney et al. (2014); Mohsin et al. (2017); Musotsi et al. (2008); Rybak et al. (2018); and Sanchez and Shannon (2012) who recorded that gardens improved access to food, supported the consumption of fruits and vegetables and provided family nutritional benefits.

The findings further revealed that Home Economics education skills training significantly improved the knowledge of women on the benefit of food waste reduction for families. It is an indication that participants have agreed to use the skills acquired in ensuring that food waste is reduced at all levels of the food system for the benefits of their families' food access and nutrition security. It also implies that the training beneficiaries are becoming more equipped and able to continue engaging in practices that support food waste reduction. Based on these findings, the null hypothesis that stated that there is no significant difference in the mean response scores of women on the benefits of food waste reduction pre and post-skill training is, therefore rejected. Post-training experience of women supported the benefits of food waste reduction since it ensured more savings, encouraged re-use of leftovers food, bettered food portioning, ensured food preservation, promoted self-life and, thus increased food access and nutrition innovation for families. These findings are in concert with Devaney and Davies (2017); Quested et al. (2011); Reynolds et al. (2019); Sewald et al. (2018); Shaw et al. (2018); Thi et al. (2015); Thyberg and Tonjes (2016); and Visschers et al. (2016) who reported some benefits of food waste reduction to families. Some of these benefits included ensuring more savings, promoting self-life, encouraging re-use of leftovers food, increasing food access, and ensuring food preservation skills.

Implications

The implications of this study are the observed narrow skills gap in knowledge and practice in the kitchen garden and food waste reduction among families. Training families in complex and multi-faceted skills of this nature would provide behaviour change in food production and better dietary practices. Such practices are to bring support for better eating, nutrition and body immunity during the pandemic. Addressing the knowledge and practice gap is to ensure families have access to food. Availability of food has a direct link to food consumption during COVID-19 and also helps meeting SDG target 2030. The practical skills training approach is to sustain and promote individual, community, and family behaviour change. The practice is to ensure appropriate behaviours toward food security and provide support to all international food programmes that deal with families and societies.

Limitations

This study is not without limitations despite its contribution to family food access and nutrition security, majorly among the limited time and small sample size of respondents from non-random selection due to COVID-19 measure curtailing large gathering of people. More training and investigation using socioeconomic variables and a larger sample size with adequate time to cover the gap of this study suggested.

Conclusion and recommendations

COVID-19 exacerbated burdens of poor food access and nutrition insecurity to families. This calls for a holistic approach to tackling the menace. The solution to this menace is achievable through working together with families in providing strategic intervention to empower women to work toward food production. This will help increase access to food and improve family nutrition and avert food crises. Home Economics professionals have a role to play in sustainable food production and access through giving appropriate skills training in all areas of the food supply chain system during food crises situation like the COVID-19 pandemic and beyond. The findings of the study clearly showed that participants' interest in the skills training created awareness of the benefits of kitchen garden establishment and food waste reduction. This made the rural women demonstrated substantial improvement in the practices that benefit family food access and nutrition security. The continuation of these practices is expected to make food available during this pandemic and assist in meeting SDG 2030 target.

This study, therefore, calls on policymakers to support the establishment of gardens in the communities through a partnership between food-related professionals, government and non-governmental agencies in ensuring that resources are allocated for various interventions that support food production and poverty reduction, especially among rural families for the overall interest of food and nutrition security.

Author biography

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