

**DYNAMICS OF HEALTH EDUCATION ON FOOD SECURITY AMONG THE
REFUGEES IN DADAAB REFUGEE CAMP, KENYA**

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**Thesis submitted in partial fulfilment of the requirements for the award of the degree of
Master of Governance, Peace, and Security in the department of Governance, Peace and
security, School of Humanities and Social Sciences of Africa Nazarene University**

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DECLARATION

I declare that this document and the research that it describes are my original work and that they have not been presented in any other university for academic work.

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DEDICATION

This work is dedicated to my daughter Arlene Vakhoya who has been a constant motivation in my pursuit of leadership growth and was instrumental in my decision to further my studies. I recognize the contribution of my family and my mentors.

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ABSTRACT

Refugees and asylum seekers face persistent food security challenges due to their heavy reliance on humanitarian aid, which is increasingly unsustainable amid global crises driven by conflicts and disasters. This study investigates the role of health education in improving food security in Kenya's Dadaab refugee camp, emphasizing the need for a comprehensive, multidisciplinary approach to empower these vulnerable populations. The study adopts Systems Theory and Network Society Theory as its theoretical framework. Systems Theory conceptualizes food security as a dynamic and interdependent system consisting of four pillars; availability, access, utilization, and stability, where disturbances in one affect the entire system through feedback loops. Network Society Theory complements this by framing food security within a complex network shaped by flows of information, power, and resources, where actors play differentiated roles in shaping access, decision-making, and education delivery. Using a concurrent mixed-methods descriptive design, the study surveyed 385 refugee households, conducted 43 Key Informant Interviews (KIIs), and held 28 Focus Group Discussions (FGDs) involving refugees, host communities, humanitarian actors, and government officials. Demographically, the sample was dominated by female respondents (69.9%) and long-term residents (70.4%), indicating a relatively stable and feminized refugee population. Most participants were young (18–59 years), economically vulnerable (55.6% had no income-generating activities), and lacked formal education (72.4%), which hinders their engagement with health education and capacity to act on food security strategies. The study revealed that 78.4% of households depended on food aid from the World Food Programme (WFP), indicating high external dependency. However, access to health education particularly through facility-level or technology-based channels was associated with greater understanding of food security issues. Multivariable logistic regression analysis provided statistical evidence supporting these findings. Individuals aware of facility-based (adjusted Odds Ratio [aOR] = 2.95; 95% Confidence Interval [CI]: 1.62–5.38; $p < 0.001$) and technology-based (aOR = 3.06; CI: 1.63–5.75; $p = 0.001$) health education strategies were significantly more likely to understand food security concepts. Other positive predictors included satisfaction with health education programs (aOR = 2.17; $p = 0.015$), access to income (aOR = 4.36; $p < 0.001$), and the ability to procure food beyond aid (aOR = 1.86; $p = 0.041$). In contrast, prolonged refugee status (aOR = 0.42; $p = 0.001$) and governance barriers (aOR = 2.86; $p < 0.001$) were significant constraints. These findings underscore the importance of integrating context-specific and accessible health education strategies into refugee support systems. Facility-level outreach and technology-enhanced education (e.g., mobile or digital platforms) can significantly improve understanding and engagement. Moreover, governance structures play a critical role in shaping program effectiveness, suggesting that policy reforms, improved coordination, and funding mechanisms are vital to success. In conclusion, the study recommends a multidimensional approach that enhances governance, promotes income generation, integrates refugee and host communities, and deploys innovative education strategies. Tailored, community-driven solutions are essential to empower refugees in Dadaab to make informed, independent decisions towards achieving sustainable food security.

OPERATIONAL DEFINITION OF TERMS

Health Education on Food Insecurity: In this study, health education is operationalized as a component of primary health care that employs preventive approaches to promote improved health outcomes. Specifically, in relation to food insecurity, it involves the One Health approach; education and training programs that deliver awareness-level and in-depth knowledge on food security issues. Topics include local and global food and feed supply, food safety, waterborne illnesses, agriculture, ecosystem health, and food systems. It is delivered through facility-based sessions, technology platforms, and community outreach, and is measured by levels of awareness, participation, and comprehension among refugees and host communities.

Food Insecurity: Food insecurity is defined as the inability of refugees and host community members to obtain sufficient food, either due to a lack of availability or uncertainty about the next meal. Operational indicators include frequency of food consumption, dependence on food aid, and self-reported food insufficiency.

Food Security: Food security exists when individuals in the refugee and host communities can consistently acquire safe and nutritious food in sufficient quantity to meet their dietary needs. It is measured through indicators such as dietary diversity, number of meals per day, income levels, and independence from aid.

Dynamics of Health Education: This refers to the ability of individuals or organizations (including refugees, the host community, humanitarian actors, private sector, and government) to understand, adapt to, and respond to changes in health education approaches on food security. It is operationalized by assessing awareness of various education strategies, responsiveness to program adjustments, and stakeholder engagement levels.

Food Availability: This term is defined as the presence of adequate food stocks in local markets within Dadaab and its surroundings, fair trade practices, and sufficient local food production. Operational indicators include market stock levels, types and quantities of available food, and supply chain functionality.

Food Access: Food access in this study is understood as the economic and physical ability of Dadaab residents to obtain food. It is measured by household income levels, affordability of food items, market accessibility, and infrastructure quality for food delivery.

Food Utilization: Food utilization refers to the use of food in ways that ensure adequate intake of nutrients and energy, involving proper feeding, preparation, and distribution practices. Operational indicators include dietary diversity scores, knowledge of food preparation, and intra-household food distribution practices.

Food Stability: Food stability is present when the three components; availability, access, and utilization, are sustainably met over time. It is operationalized by examining consistency in food supply, income stability, and low variability in food access or dietary intake over weeks or months.

Refugee: A refugee is defined operationally as an individual residing in Dadaab who has crossed international borders due to threats of persecution, conflict, or disaster, and is recognized under international protection by the UNHCR. Inclusion criteria are based on UNHCR registration status.

Open Data Kit (ODK): ODK is an open-source digital tool used in this study for data collection. It is employed for administering surveys and capturing responses in low-resource field settings. Operationally, it supports real-time data entry, GPS tagging, and multilingual support during household surveys, KIIs, and FGDs.

Sampling Frame: The sampling frame refers to the complete list of all eligible sampling units (households, individuals, organizations) in Dadaab from which the study's participants are drawn. It is the basis for the random or stratified selection of participants and ensures representativeness of the study population.

ABBREVIATIONS/ACRONYMS

ATFC- Ambulatory Therapeutic Feeding Centre

CHVs- Community Health Volunteers

DRS- Department of Refugee Services

FAO- Food and Agriculture Organization of the United Nations

GAM- Global Acute Malnutrition

IFAD- International Fund for Agricultural Development

INGOs-International Non-Governmental Organizations

IRC- International Rescue Committee

ITFC- Inpatient therapeutic feeding program

JAM- Joint Assessment Mission

KII – Key Informant Interview

KNBS- Kenya National Bureau of Standards

KRCS- Kenya Red Cross Society

LWF- Lutheran World Federation

MSF- Medicine Sans Frontier

MOH- Ministry of Health

NACONEK- The National Council for Nomadic Education in Kenya.

NGO- Non-Governmental Organizations

NRC- Norwegian Refugee Council

ODK – Open Data Kit

ORS-Oral Rehydration Salt

REACH- A joint initiative of IMPACT Initiatives, Agency for Technical Cooperation and Development (ACTED), and the United Nations Operational Satellite Applications Programme (UNOSAT).

SFP- Supplementary Feeding Programme

SENs- Standardized Expanded Nutrition Survey

WHO- World Health Organization

WFP- World Food Programme

UNICEF-United Nations Children Education Fund

UNHCR- United Nations High Commissioner for Refugees

UN-Habitat- United Nations Human Settlement Programme

CHAPTER ONE: INTRODUCTION

1.1 Introduction

The chapter introduces the background of the study, the central research problem, concepts related to the problem, in this case health education and food security, methods used to analyse the problem, why the study is important and how the outcome of the study will affect society, government and funders/ donors.

1.2 Background of the study

In today's global society, the world faces mounting challenges in providing adequate food, housing, and healthcare, issues largely driven by rapid population growth and the unsustainable use of natural resources (Garcia et al., 2020). Environmental degradation, systemic inequality, and climate change have compromised the planet's ability to support future generations. These challenges are particularly pronounced in contexts of forced migration, where refugees are displaced by a complex mix of conflict, violence, human rights violations, and increasingly, environmental disasters. As of 2023, the global refugee population stood at an estimated 35.7 million, with many more internally displaced or seeking asylum amid persistent geopolitical instability and social inequities (UNHCR, 2021).

Despite ongoing international efforts by organizations like the Food and Agriculture Organization (FAO) and the World Food Programme (WFP), food insecurity remains a pressing global concern. The State of Food Security and Nutrition in the World (SOFI) report notes a 29.6% increase in the global population experiencing moderate to severe food insecurity in 2022 compared to 2019 (FAO, 2022). An estimated 3.1 billion people were unable to afford a healthy diet in 2022, an increase of 112 million from the previous year, underscoring the rising inequality in access to food. Refugees and asylum seekers are disproportionately affected due to displacement, resource scarcity, and restricted access to local food systems, with nearly half of refugee households facing moderate to severe food insecurity (FAO, 2022).

Continued population growth further strains natural resources, leading to environmental degradation and jeopardizing sustainable food production (Tilman et al., 2011). With the global population projected to exceed 9.7 billion by 2050, demanding over 50% more food than is

currently produced, there is a growing need for a holistic, interdisciplinary approach. The "One Health" model emphasizes the interconnectedness of human, animal, and environmental health, proposing that sustainable food systems must integrate public education, food safety, and environmental stewardship (Garcia et al., 2020).

Studies support the value of education in addressing food insecurity. For instance, Hejazi et al. (2023) demonstrated that comprehensive nutrition education improved diet quality among low-income women-headed households in Iran, even in the absence of financial aid. When paired with food or cash assistance, such programs further enhanced food security. Similarly, Mortazavi et al. (2021) found that teaching individuals how to manage resources significantly improved dietary habits and access to healthy food. These interventions are particularly relevant in Kenya, where Article 43(1.c) of the 2010 Constitution recognizes food and nutrition as fundamental rights (Government of Kenya, 2010). However, the Kenya National Bureau of Statistics (2021) reports that 38.6% of individuals and 34.7% of households live in overall poverty, figures that are likely even higher among refugee populations.

The Dadaab refugee camp, established in 1992 in a semi-arid, flood-prone region of northeastern Kenya, hosts approximately 419,155 of Kenya's 829,211 refugees and asylum seekers (UNHCR, 2025). Its proximity to Somalia, Ethiopia, and South Sudan exposes residents to transboundary diseases and security threats. Food insecurity in Dadaab is cyclical, influenced by climate variability, poor agricultural practices, disease, and limited employment opportunities (Aouinti et al., 2024; Dutta, 2024). The camp's location, restricted mobility, and protracted encampment compound these vulnerabilities. In 2015, the WFP reported that 23% of households in Dadaab were moderately or severely food insecure, up from 17% the previous year (WFP, 2020).

Most refugees in Dadaab depend on in-kind food assistance or cash-based transfers, with limited ability to work or move freely beyond the camp unless for medical, resettlement, or educational reasons (Kenya, 2024). According to UN-Habitat (2021), 41.9% of families in Dadaab worried about where their next meal would come from; among refugees, this figure was 24.9%, and among host communities, 16.9%. Homes affected by food insecurity comprised nearly 30% of all households missing meals in the two weeks prior to the survey.

The recent gazettment of Kenya's 2021 Refugee Act signals a shift toward sustainable solutions such as self-reliance and alternative livelihoods, moving away from long-term dependency on

humanitarian aid (Kenya, 2022). However, barriers remain, including limited employment opportunities and underpaid services, which leave refugees disempowered and reliant on aid (Abdi, 2005).

The COVID-19 pandemic, while not a direct food safety issue, disrupted food systems globally, affecting lives, livelihoods, and public health. Health education played a critical role in mitigating pandemic-related risks affecting access to food, livelihoods, and nutrition (Mardones et al., 2020). In refugee settings, service delivery is guided by UNHCR Sphere standards across thematic areas including health, nutrition, water, sanitation, protection, education, and food security (UNHCR, 2012). In Dadaab, health education is delivered through community-based (e.g., Community Resource Persons), facility-based (e.g., health workers, teachers), and institution-based platforms (e.g., FilmAid Kenya, local radio) (UNHCR, 2015).

Globally, while some projections indicate a potential decline in food insecurity over the next 30 years, Sub-Saharan Africa is expected to experience worsening conditions due to conflict, climate change, and environmental degradation (He et al., 2022; Esin et al., 2024). These stressors drive displacement, destroy livelihoods, and disrupt essential services such as healthcare and education—further compounding food insecurity (Nisbet et al., 2022).

Displaced populations are often underrepresented in health research due to mobility, geographic isolation, economic hardship, language barriers, and distrust of institutions (Aljadeeah, 2022; Esin et al., 2024). Yet, with nearly half of refugee households experiencing moderate to severe food insecurity, understanding the complex interplay between displacement, public health, and education is essential (FAO, 2022).

Educational interventions are increasingly recognized as cost-effective and sustainable strategies for improving food and nutrition outcomes (Ismal et al., 2020; Mortazavi et al., 2021). Beyond increasing knowledge, these programs enhance cultural and nutritional literacy and support healthier behaviours (Traoré et al., 2012). Evidence from Nigeria and Kenya shows that combining nutrition education with cash transfers or training in kitchen gardening and livestock rearing improves household food security (Shapu et al., 2022; UNICEF, 2022). These approaches, when context-specific and tailored to community needs, offer a viable pathway to sustainability.

Effective interventions require structured, evidence-based health education strategies that promote healthy behaviours, improve literacy, and foster enabling environments (Glanz et al., 2008). Delivery may occur via clinics, schools, community programs, or digital platforms like mobile apps (FAO, 2020). When aligned with local food systems, such strategies shift the paradigm from humanitarian relief to development by empowering refugees to pursue self-reliance (MacPherson & Sterck, 2019).

Despite efforts in Dadaab to provide health education, many programs remain fragmented, costly, or inconsistently implemented, often failing to reach target populations effectively (Hejazi et al., 2023). Existing studies focus on narrow aspects like nutrition, but little is known about the broader dynamics of health education as it relates to food security in refugee settings like Dadaab. As food insecurity persists, there is an urgent need to examine and refine educational approaches to inform better policy and program design.

1.3 Statement of the Problem

Food insecurity remains one of the most pressing humanitarian challenges in refugee settings globally, disproportionately affecting populations in protracted displacement. The Dadaab Refugee Complex in northeastern Kenya is one of the world's largest, currently hosts approximately 419,000 refugees and asylum seekers, mainly from Somalia, South Sudan, and Ethiopia (UNHCR, 2025). Despite decades of humanitarian intervention, food insecurity in Dadaab persists, exacerbated by environmental degradation, legal constraints, and insufficient or inconsistent aid provision.

Studies indicate a significant decline in the quality and quantity of food aid distributed in Dadaab, resulting in reduced caloric intake and compromised dietary diversity (Abdi, 2005; FAO, 2022). Sorghum, a staple provided in rations, is frequently traded for more preferred or needed goods, contributing to nutritional deficiencies, especially among women and children. REACH and NRC (2021) report that over 80% of households in the camp resort to loans to meet basic food needs, with 97% using borrowed funds to purchase food. These statistics illustrate a growing reliance on negative coping mechanisms, including ration selling, borrowing, and meal skipping, all of which undermine long-term health outcomes.

Compounding the crisis are legal and policy restrictions that limit refugees' access to employment, land ownership, and mobility (UNHCR, 2023). The encampment policy confines refugees to camp

areas, barring them from engaging in meaningful livelihood activities that could improve food security. Furthermore, insecurity, particularly linked to Al-Shabaab activity near the border region, disrupts market systems and restricts humanitarian access (Redaction Africa News, 2023). Environmental factors, including recurrent droughts, floods, and aridity, further strain the fragile ecosystem shared by refugees and host communities (UN-Habitat, 2021).

Although various actors like governmental, humanitarian, and private sector have attempted to address food insecurity through in-kind food distribution, cash transfers, and livelihood programs, structural barriers and fragmented implementation hinder sustainable progress (Hejazi et al., 2023). One promising but underutilized intervention is health education, particularly nutrition education programs that promote dietary knowledge, behavior change, and long-term self-reliance. Evidence suggests that health education can be a cost-effective and sustainable strategy to address food insecurity, especially when integrated with other forms of support such as cash assistance or agricultural training (Savari et al., 2020; Shapu et al., 2022; UNICEF, 2022).

However, in Dadaab, existing health education efforts are largely uncoordinated, inadequately resourced, and poorly adapted to the socio-cultural and ecological context of the refugee population (Hejazi et al., 2023). Many of these programs fail to incorporate the One Health approach, which emphasizes the interconnectedness of human, animal, and environmental health and advocates for multidisciplinary solutions (Garcia, 2020). Moreover, program coverage, accessibility, and message retention remain unclear due to insufficient monitoring and evaluation.

Globally, the problem is becoming more urgent. By 2050, global food demand is expected to increase by over 50%, placing further stress on already strained systems (Tilman et al., 2011). Sub-Saharan Africa, with its high levels of displacement and vulnerability to climate change, is projected to face worsening food insecurity in the coming decades (He et al., 2022). Refugees, often marginalized from national services, remain among the most food-insecure groups worldwide (FAO, 2022; Esin et al., 2024). Their challenges include limited health access, cultural and language barriers, geographic isolation, and poor legal protection (Aljadeeah, 2022).

Despite growing consensus on the value of education-based interventions, limited research has examined their specific role in improving food security in refugee settings like Dadaab. Most evaluations focus on material aid and cash transfers, while overlooking the critical function of

knowledge transfer in shaping food choices and long-term resilience (Glanz et al., 2008; MacPherson & Sterck, 2019). This represents a critical knowledge gap.

Thus, the central problem is not merely the lack of food, but the inadequacy of current strategies particularly in health education to equip refugees with the tools and knowledge needed for long-term food security. Without a shift toward more integrated, participatory, and evidence-based educational approaches, humanitarian interventions risk perpetuating dependency and vulnerability.

1.4 Purpose of the Study

This study was undertaken to investigate the role of health education in influencing food security among refugee and host populations in the Dadaab Refugee Camp. At the time of the research, health education initiatives were ongoing in the camp and surrounding host communities, yet food insecurity remained an urgent and deepening challenge (REACH & NRC, 2021; FAO, 2022). Many of the interventions observed were poorly coordinated, inconsistently delivered, and not sufficiently adapted to the unique social, cultural, and environmental conditions of protracted displacement (Hejazi et al., 2023). Despite the presence of these programs, it was unclear whether their messages reached the intended populations effectively or whether they influenced behaviour change. Households continued to rely on negative coping mechanisms such as selling food rations, skipping meals, or borrowing money to purchase food, highlighting persistent gaps in the effectiveness of health education strategies (REACH & NRC, 2021).

Global literature had pointed to the potential of health and nutrition education as low-cost, sustainable solutions to food insecurity (Savari et al., 2020; UNICEF, 2022). However, prior to this study, such approaches had not been rigorously examined within the context of Dadaab. Most previous research focused narrowly on nutrition-specific interventions, failing to consider the broader health education framework and its implementation constraints in refugee settings marked by resource scarcity, legal limitations, and cultural diversity (MacPherson & Sterck, 2019; Aljadeeah, 2022). Furthermore, there was little insight into how these programs were perceived by the target communities, the extent of their accessibility, or how their content aligned with local needs and realities (Hejazi et al., 2023).

The study also addressed the lack of integration between health education efforts in Dadaab and the One Health framework, which emphasizes the interconnectedness of human, animal, and

environmental health systems (Garcia, 2020). It was necessary to assess whether existing programs considered these interdependencies or if they operated in silos that limited their overall effectiveness.

To fill these knowledge gaps, the research identified and examined the health education strategies aimed at improving food security, evaluated the accessibility and cultural relevance of those programs, and explored the relationship between participation in health education and household food security outcomes. In addition, the study investigated the structural, legal, and ecological factors that either facilitated or constrained the impact of health education in the camp (UNHCR, 2023; Redaction Africa News, 2023; UN-Habitat, 2021).

The findings from this study contributed to a more nuanced understanding of how health education influences food security in displacement settings. They offered critical insights for policymakers, humanitarian organizations, and program implementers seeking to design integrated, context-sensitive, and sustainable interventions. Ultimately, the study provided evidence to support more effective models of health education that can promote long-term food security, self-reliance, and resilience among refugees and host communities in Dadaab and similar protracted displacement environments.

1.5 Objectives of the Study

1.5.1 General Objective

The general objective of the study was to investigate the dynamics of health education programs on food security among refugees in the Dadaab Refugee Camp, Kenya.

1.5.2 Specific Objective

- i. To assess the current health education strategies in food security in the Dadaab Refugee Camp, Kenya.
- ii. To analyse the nexus between participation in health education and food security in the Dadaab refugee Camp, Kenya
- iii. To determine the key factors that may influence the success of health education in food security in the Dadaab Refugee Camp, Kenya
- iv. To explore potential health education strategies that enhance food security in Dadaab refugee camp, Kenya.

1.6 Research Questions

- i. What are the current health education strategies used in food security in the Dadaab Refugee Camp, Kenya?
- ii. How does participation in health education relate to food security indicators in the Dadaab Refugee Camp, Kenya?
- iii. What are the key factors that may influence the success of health education in food security in the Dadaab Refugee Camp?
- iv. What additional health education strategies can be deployed to enhance food security in Dadaab refugee Camp?

1.7 Significance of Study and Anticipated Output

A study to assess barriers, opportunities and future directions in health information sharing in the humanitarian context indicated that health Information Sharing is considered important in the humanitarian setting, yet it is not appreciated (Nair et al., 2022). Study findings facilitate managerial interventions for addressing food insecurity by advising on better strategies for adoption in health education programs. The study shapes perceptions and attitudes towards adoption of health education to enhance food security in Dadaab camp. Knowledge from this study is an opportunity for managers to review policies and guidelines to support vulnerable refugees and address food insecurity. The study is expected to add to what is already known about health education in relation to food security. Managers can use the study's findings to fill in gaps in current strategies for health education in this area, which should lead to better food security indicators and better outcomes. Refugees and host communities can also reap the benefits of advocacy efforts and improved measures put in place by stakeholders to raise awareness and empower them to make better decisions.

1.8 Scope of the Study

This study focuses on examining the dynamics of health education strategies in addressing food security within the Dadaab Refugee Complex in Kenya, during the period October 2023 to January 2024. Although health education related to food security is well documented in general contexts, its specific dynamics within refugee settings where structural, cultural, and resource constraints intersect remain inadequately understood. This study aimed to assess existing health education strategies on food security; analyse the relationship between refugee participation in health

education and food security outcomes; identify key success factors influencing these strategies; and explore effective, context-specific health education approaches that can contribute to improved food security outcomes within the Dadaab refugee

The study was geographically and demographically limited to four refugee camp clusters—Dagahaley, Hagadera, Ifo 1, and Ifo 2—under the Dadaab Refugee Operation, as well as selected members of the surrounding host communities. The target population included a diverse group of stakeholders, comprising 385 refugee households, 10 humanitarian workers, 4 government officials, 6 refugee workers, and 40 community leaders, reflecting a wide spectrum of individuals either directly affected by or actively engaged in food security and health education programming.

Primary data was collected using a combination of household-level surveys, focus group discussions (FGDs), and key informant interviews (KIIs). These data collection exercises were conducted at strategically selected sites including food distribution points, health facilities, schools, community centers, and interagency field offices, to capture a comprehensive picture of health education delivery and its intersection with food security. The research team consisted of one research coordinator, one statistician, twenty enumerators, and three data entry clerks, who were engaged through digital communication for a structured research timeline—10 days of data collection, followed by 5 days of data entry, 5 days of data analysis, and 5 days dedicated to report writing.

Data analysis employed both descriptive and inferential statistical methods, aligned with the objectives of the study. For instance, analysis related to health education strategies utilized descriptive statistics to identify commonly known or preferred approaches, while inferential methods were applied to examine the impact of these strategies on the four key pillars of food security: availability, access, utilization, and stability. The study was guided by systems theory and network theory; the former was used to identify systemic gaps and inefficiencies within health and food security structures, while the latter explored the relational dynamics and linkages among stakeholders and interventions within the broader food security framework.

This study thus contributes valuable insights into the nuanced interplay between health education and food security within displaced populations, offering evidence-based recommendations for enhancing the resilience and nutritional well-being of refugees in protracted crisis settings.

1.9 Delimitation of the Study

The study was delimited to Dadaab refugee camp and surrounding host community within 5 Kilometres radius in Dadaab, Kenya. The reason for host community inclusion is based on the social, political, and economic consequences of hosting refugees. The international community through UNHCR supports refugees to alleviate a possible fiscal burden on the hosting country through the provision of subsistence needs. The host community within 5 Kilometres radius receives significant support from the international community in the form of infrastructure development, grants, or cash-based assistance as well as sharing markets and provision of employment opportunities.

1.10 Limitation of the Study

The objectives of the study were narrowed to mitigate against the need to use multiple methodologies that may be confusing to the users. This as a result increased the level of focus for the study to achieve its objectives. Primary and secondary data was employed in data collection and the study addressed limitations that come with these approaches through the formulation of a work plan and budget, training of research collectors, and use of better sampling techniques.

Response bias following respondents' inability to provide feedback was addressed by ensuring the questionnaire administered was short and easy to understand, provision of follow-up support and by training of interviewers. The survey design was considerate of the target audience and their opinion with regards to the most appropriate time for them to undertake the exercise. Ethical considerations and timely mobilization and sensitization of study participants was provided to mitigate against non-disclosure and unwillingness to participate.

The study enumerators were drawn from the host community and refugees to mitigate against access challenges to the households following possible hostility by the host community or threats from the Al-Shabaab and other militant group attacks. Focus group Discussion and Key informant interview respondents were interviewed from the nearest and most secure humanitarian agency service delivery points such as schools, hospitals, food distribution points and community service centres.

1.11 Assumptions of the Study

Assumptions that the policy environment and political situation will not negatively impact the operationalization of the Refugee Act, 2021. There will be no significant change in the population

considering that the sample size and resources have already been determined with a planned target population, that donors will continue complementing government initiatives in alignment with the policy environment and the less volatile security situation or current security instability and climate change implications will not significantly affect programming.

1.12 Theoretical Framework

1.12.1 Systems theory

According to Von Bertalanffy's General Systems Theory (1969), systems are not merely a sum of their parts, but rather interdependent components that interact dynamically. Applied to food security, this means that availability, access, utilization, and stability must be understood as interconnected components within a broader system. A change or failure in one component influences the functionality and resilience of the entire system. In refugee operations, availability depends heavily on external support, but as the situation shifts from emergency to protracted, sustainable food production and supply chains become more critical. Availability influences and is influenced by access as food may be present, but if infrastructure is poor or markets are unstable, it cannot reach the people who need it.

Health education promotes community-based agriculture, inform refugees about nutrition-rich crops, and support household-level food production. For refugees, legal restrictions, lack of income, and movement constraints often impair food access. Poor access affects utilization, as families may skip meals or rely on low-nutrition diets. Health education delivered through institutional-based approaches (e.g., schools, community centres) helps individuals understand their entitlements, nutrition budgeting, and how to navigate food assistance systems.

Even if food is available and accessible, poor utilization can lead to malnutrition and food insecurity. Utilization is deeply tied to health infrastructure, and indirectly to availability of clean water, cooking facilities, and education. Through facility/provider-based strategies, health workers can teach proper food handling, balanced diets, infant feeding practices, and hygiene thus improving nutritional outcomes. Without stability, gains in availability or utilization can be quickly reversed. For refugees, long-term planning and local integration are key to building this pillar. Stability is supported when communities are empowered to adapt knowledge and behaviours over time, building long-term resilience through consistent, targeted health education.

In the study, the barriers to food security such as poor coordination among stakeholders, policy constraints, and limited resources are viewed as disruptions in the system. Using systems theory, such disruptions are not isolated; they create feedback loops that ripple through all four pillars. For example, if food aid delivery is delayed (availability), access is limited, utilization suffers due to dietary shifts, and long-term stability is undermined. By detecting patterns of system failure, the study encourages self-reflection among stakeholders and supports the design of smarter systems that are adaptive, participatory, and better aligned with the complex, protracted nature of refugee situations. Stakeholders are now shifting from emergency to protracted strategies, acknowledging that food security is not just a humanitarian need but a developmental imperative. This requires multi-sectoral coordination in health education delivery each aligning with a different pillar, ensuring that the entire food security system is addressed, not just its parts.

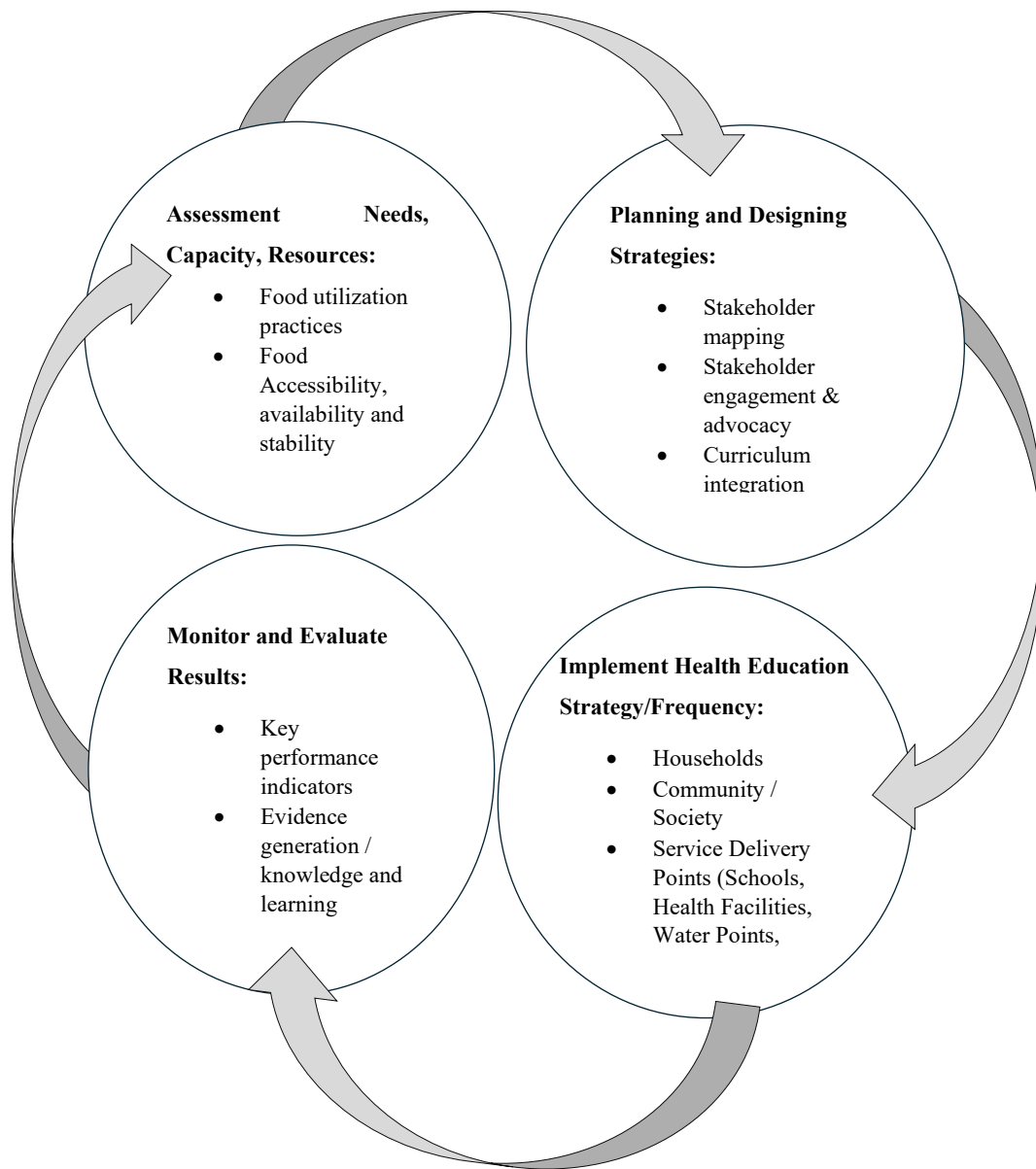


Figure 1 Health education System on food Security (Modification of WFP programme cycle)

1.12.2 Theory of the Network Society

The study applies Castells's (1996) Network Society Theory to examine food security as a networked system, particularly in refugee camp settings. Castells argues that society in the Information Age is increasingly organized around networks of information, technology, power, and relationships, which shape human behaviour in four key stages: experience, production,

consumption, and power. In this context, food security comprising the four pillars of availability, access, utilization, and stability is seen as a multilayered, networked system of actors and institutions connected through flows of resources, information, and decision-making power.

Within this network, various stakeholders hold differentiated roles, experiences, and levels of influence. Their interaction defines the effectiveness and equity of the food security system in refugee operations. The figure below (as referenced) illustrates these stakeholders across the four behavioral stages.

United Nations High Commission for Refugees (UNHCR) and Department of Refugee Services (DRS) are high in power as they are the gatekeepers of policy, coordination, and strategic direction in the camp. They exercise symbolic and structural power over resource allocation and inter-agency collaboration. They have deep institutional memory and international humanitarian experience, generate policy frameworks, logistics systems, and response plans and consume operational data and community feedback to adjust interventions. Their role in the network is central as they interconnect all other actors and enable the systemic flow of information and governance.

Operational and Implementing Partners such as World Food Programmes (WFP), Non-Governmental Organizations (NGOs) and International Non-Governmental Organizations (INGOs) have moderate power as they operate under UNHCR/DRS mandates but hold influence through specialized expertise and donor relationships. They have known experiences gained through field-level expertise in food safety, nutrition, health education, logistics, and monitoring. They produce and deliver essential services such as food, health education, capacity-building. They both generate and consume policies, funding directives, and community-level data. They play an intermediary's role in the network as they bridge between central decision-makers and grassroots actors.

Private Sector Actors such as transporters, internet providers and vendors have exhibit economic power through control over market services and infrastructure, less involved in decision-making but influential through technological and logistical contributions. They have technical and operational experience in commercial supply chains and service delivery. Producers of transport, digital connectivity, communication tools, and sometimes food products. They are also consumers

of data and contracts to align services with humanitarian needs. Their role in the network is essential for system efficiency and innovation.

Community Members (Refugees and Host Populations) have low to moderate as they are often marginalized in formal structures but possess critical local knowledge and adaptive capacities. Increasing community engagement initiatives and self-reliance programmes are shifting this dynamic. They have lived experiences of food insecurity, displacement, and coping strategies, engage in small-scale agriculture, informal trade, knowledge-sharing, and food preparation and are primary recipients of food assistance and health education messages. Their feedback loops are crucial for system resilience and accountability.

Within this framework, health education is not a standalone activity but a networked information system comprising producers of knowledge such as NGOs, health professionals, UN agencies. Disseminators such as community health workers, schools, and media and consumers such as refugee and host communities who apply the knowledge to improve food utilization and household resilience. The effectiveness of health education depends on the technologies used to transmit it (radio, mobile apps, posters), the relevance of content to local culture and needs, the interaction between stakeholders, and the power dynamics influencing who gets to shape the message and how it's delivered. The network society approach underscores how different stakeholders interact through overlapping layers of influence.

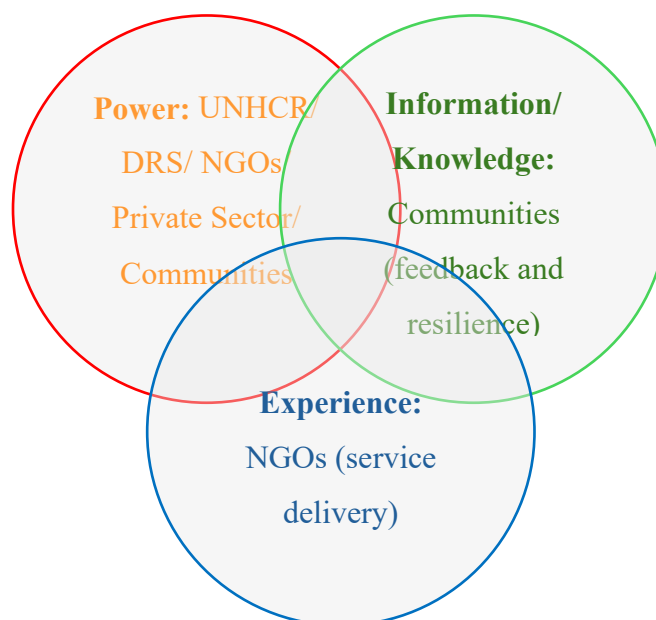


Figure 2 The Network Society Theory by Castells in the Context to the Study

1.13 Conceptual Framework

This study used concurrent mixed research methods aimed at evaluating and exploring the relationship between health education on food security and food security outcomes. Frequency and participation in the current approaches for delivery of health education on food security, nexus between health education and food security, key factors hindering successful delivery of health education on food security and approaches for effectively deliver health education on food security were the independent variables. The degree to which political good will, policy and environment mediates these relationships were also tested. In the qualitative portion, humanitarian workers, government technical workers, private sector representatives and community leaders participated with attempts to explore their lived experiences of this phenomena. Both system and network theory provided additional support to the study.

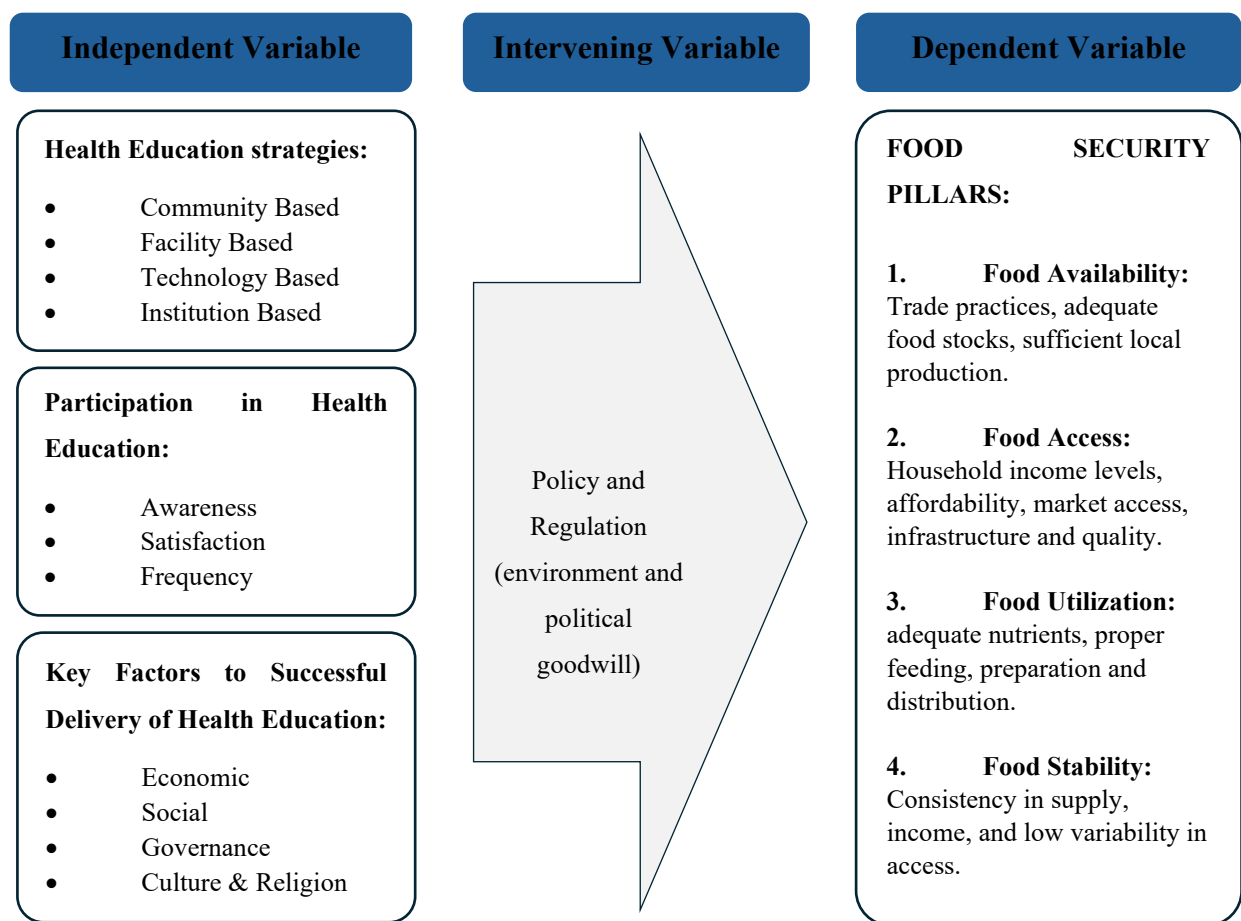


Figure 1 Conceptual Framework based on literature review (2025)

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter outlines the theory that was used in the study, which is followed by the empirical research of other studies that have looked at a scenario that is quite comparable. The chapter provides an analysis of the dynamics of health education programme in food security by deliberating on health education strategies, participation in health education programmes and barriers/ challenges of health education programmes and the relationship with food security. Lastly the chapter provides the conclusions of the literature reviewed.

2.2 Review of Literature

This section explores existing scholarly and institutional research on the relationship between health education and food security, with a specific focus on strategies, participation, influencing factors, and approaches that enhance outcomes in vulnerable populations. The reviewed literature spans global, regional, and local contexts and highlights the multidimensional nature of food security, integrating educational, economic, health, and environmental perspectives. Key themes include how health education empowers individuals and communities, the role of targeted interventions in improving nutrition, and the importance of interdisciplinary and context-specific approaches. By synthesizing findings from a range of empirical studies and development programs, this review aims to establish a comprehensive understanding of how health education contributes to the achievement of food security, particularly in settings affected by displacement, poverty, and limited access to resources.

2.2.1 Health Education Strategies in Food Security

Ismail (2020) explored the complex linkages between education, health, economic growth, and food security in Bangladesh. Using macroeconomic indicators over a two-decade period (1998–2017), the study confirmed that investments in education and health positively influence economic development and, by extension, food security. These findings align with human capital theory, suggesting that improved education enhances individuals' ability to secure food through both income generation and better decision-making. However, while the study makes a strong theoretical case at the national level, it lacks granularity when applied to highly vulnerable or displaced populations. Refugee settings such as Dadaab, characterized by systemic barriers to formal education and employment, are poorly represented in this analysis. The macro-level

approach also overlooks localized socio-cultural and institutional constraints that influence the effectiveness of health education in real-world, low-resource contexts.

Similarly, Shapu et al. (2022) evaluated the effects of school-based health education interventions targeting adolescent girls in Borno State, Nigeria. The intervention, which focused on nutritional knowledge, attitude, and behaviour, showed measurable improvements in dietary choices and understanding of food groups. While the study demonstrates the potential benefits of structured health education in improving food-related outcomes among youth, it is contextually narrow. Borno's school setting provides a degree of structure and relative stability that is not readily transferable to displaced populations in camps like Dadaab, where educational access is sporadic and constrained by insecurity, poverty, and legal status. Furthermore, the study lacks a critical assessment of the structural determinants such as gender norms, displacement status, or food aid dependency that might moderate or inhibit behaviour change despite increased knowledge.

UNICEF (2022) implemented a more integrated model in rural Kenya, combining conditional cash transfers with nutrition counselling delivered by Community Health Volunteers (CHVs). This initiative targeted pregnant women and young children, aiming to improve child nutrition and household food security through both economic and behavioural interventions. While qualitative findings revealed improvements in household practices, such as the adoption of kitchen gardening and small livestock keeping, the quantitative outcomes particularly on stunting reduction were modest. Although the pilot effectively integrated financial support with health education, it remains limited by its short timeframe and questions about long-term sustainability. Moreover, the program did not fully situate its intervention within a broader ecological or systems-based framework such as One Health, thereby missing an opportunity to link human health with environmental and agricultural sustainability in a more cohesive strategy.

2.2.2. Nexus between participation in health education and food security

Pérez-Expósito and Klein (2009) examined strategies to improve the micronutrient intake of infants and toddlers in developing countries, focusing primarily on the use of fortified blended foods alongside caregiver education. Their study confirmed that health education for caregivers contributed to increased consumption of fortified foods, positively influencing children's nutritional status. However, while the findings underscore the nutritional value of fortified foods and the potential of caregiver involvement, the study does not engage with the structural and

contextual barriers that often limit the reach and effectiveness of such education, particularly in displacement contexts characterized by cultural disruption, economic instability, and constrained access to services. Moreover, the emphasis on food supplementation tends to cast education as a secondary support mechanism, rather than a transformative tool capable of driving long-term behavioural and systemic change in food security.

Beryne (2015) investigated low rates of exclusive breastfeeding in Kenya through the lens of the Theory of Planned Behaviour (TPB), analysing how beliefs, perceived behavioural control, and social norms shaped women's intentions and practices. The research found that while most mothers-initiated breastfeeding, maintaining exclusive breastfeeding was undermined by factors such as misinformation, cultural taboos, and limited community support. The study rightly highlighted that access to health education, peer counselling, and male partner involvement significantly improved exclusive breastfeeding outcomes, which in turn enhanced infant food security. However, the Theory of Planned Behaviour (TPB) framework, while useful in understanding individual-level motivations fails to fully account for broader systemic issues such as poverty, gender inequality, or institutional neglect that influence maternal behaviour in refugee and host communities. The study assumes a level of personal agency that may not be realistic in humanitarian contexts where women face structural constraints and chronic insecurity.

Gundersen and Ziliak (2015) provided robust evidence linking food insecurity to negative health outcomes in children within the United States. Their findings revealed that children in food-insecure households were significantly more likely to suffer from poor health and conditions such as asthma, reinforcing the bidirectional relationship between food access and physical well-being. While this research is critical in illustrating the health consequences of food insecurity, its applicability to humanitarian settings is limited. Conducted in a high-income context with relatively stable institutional support, the study does not explore health education as a proactive intervention, nor does it address the multifaceted drivers of food insecurity in displacement settings such as environmental shocks, political instability, and under-resourced health systems. As such, its relevance to refugee populations, like those in Dadaab, is peripheral at best.

Together, these studies affirm the potential of health education in shaping food-related behaviours and outcomes but also highlight a recurring gap: the failure to fully engage with the structural, cultural, and institutional complexities that define vulnerable or displaced populations. This

underscores the need for context-specific research that situates health education within the lived realities of those facing compounded risks of food insecurity.

2.2.3 Key factors Influencing the Success of Health Education on Food Security

Savari, Sheykhi, and Amghani (2020) explored the role of educational interventions in enhancing food security among rural women in Sirvan County, Ilam Province, a region grappling with chronic food insecurity. Using Structural Equation Modelling (SEM) on a sample of 368 women, the study demonstrated that access to educational tools such as media programs, family dialogue, and participation in community networks had a significant positive effect on women's engagement in food security practices ($R^2 = 0.49$). Variables such as attendance in agricultural extension courses, nutritional awareness, and household communication emerged as critical enablers. While the study offers valuable evidence of the positive relationship between education and women's participation in food security initiatives, its analysis remains limited by a lack of attention to entrenched gender norms and socio-political barriers. The findings presuppose an enabling environment for knowledge application, overlooking how patriarchal structures, unpaid care burdens, and constrained access to resources often undermine the agency of women especially in fragile contexts like refugee camps where intersecting vulnerabilities may further restrict women's autonomy.

Christine and Ernest (2011) examined the impact of the 2008 global economic crisis on health-related service delivery by NGOs in Kenya, focusing particularly on how funding disruptions affected core interventions like health education. The study found that donor volatility led to widespread downsizing, reduced budgets, staff attrition, and the suspension of key program activities, ultimately compromising service delivery. Although the research effectively highlights the operational challenges posed by external economic shocks, it frames these setbacks primarily as logistical and administrative issues. The study would have benefitted from a deeper interrogation of the systemic dependencies within humanitarian programming namely, overreliance on short-term donor cycles, limited local ownership, and weak institutional resilience. Furthermore, it misses an opportunity to critically examine how health education initiatives can be restructured to withstand financial fluctuations and governance instability, particularly in protracted displacement settings where continuity and community embeddedness are essential for long-term impact.

Together, these studies underscore the significance of educational access and institutional frameworks in shaping food security outcomes. However, both tend to under-theorize the complex interplay between structure and agency failing to adequately account for how gendered power relations, funding fragility, and sociopolitical marginalization constrain the efficacy of health education interventions. A more critical and context-sensitive lens is therefore required to understand not just what works, but under what conditions, for whom, and with what limitations.

2.2.4 Health education strategies enhancing food security

Singh et al. (2022) advocate for a paradigm shift in global food security strategies arguing for an integrated food systems approach that addresses both undernutrition and the rising incidence of non-communicable diseases (NCDs). The study calls for increased emphasis on food biodiversity, functional food labelling, and dietary risk education, particularly as low- and middle-income countries undergo nutritional transitions. By highlighting the limitations of a supply-focused view of food security, the authors align their analysis with the evolving discourse around food utilization and health outcomes. However, despite the relevance of this framework to broader development contexts, the study does not offer concrete pathways for adaptation in crisis-affected or highly constrained environments such as refugee camps. The authors assume a degree of consumer agency and market engagement that does not reflect the structural limitations faced by displaced populations, whose dietary options are often determined by humanitarian rationing systems, donor priorities, and limited infrastructure. Consequently, while Singh et al.'s framework is normatively compelling, it remains abstract when applied to populations with constrained autonomy and limited access to diversified food systems.

Garcia et al. (2020) present a conceptually robust One Health model, emphasizing the need for cross-sectoral collaboration among environmental, animal, and human health systems to tackle food insecurity. Their call for a new generation of food system professionals trained in interdisciplinary and context-sensitive approaches is timely given the increasing complexity of global food challenges. The One Health approach recognizes that food security intersects with zoonotic disease transmission, environmental degradation, and public health policy thus requiring an integrated and systems-thinking perspective. However, while the authors underscore the importance of holistic education in equipping professionals to respond to global food threats, their discussion is less effective in addressing the operational constraints of applying such models in

fragile settings. In environments like Dadaab, the implementation of One Health strategies is severely hindered by fragmented governance structures, chronic underfunding, and weak coordination across sectors. Garcia et al. (2020) do not sufficiently explore how to localize or scale such a model in displacement settings where basic services are already strained, and institutional capacity is minimal.

Both studies emphasize the growing recognition of food security as a multi-dimensional issue shaped not only by food quantity but also by nutritional quality, public health outcomes, and environmental resilience. Yet, their recommendations risk privileging high-level policy discourse and technical frameworks without adequately addressing the realities of humanitarian contexts. This gap highlights the importance of tailoring education and food system strategies to settings marked by displacement, political instability, and systemic exclusion. In such environments, the transformative potential of education must be evaluated not just in terms of content, but also in terms of accessibility, cultural relevance, and structural feasibility.

2.2.5 Research Philosophy

This study is grounded in critical realism, a philosophical paradigm that acknowledges the layered nature of reality, distinguishing between empirical observations, actual events, and the deeper generative mechanisms that produce them (Bhaskar, 1978). Unlike positivist approaches, which privilege observable and measurable variables, critical realism seeks to uncover the causal structures and contextual conditions that shape social phenomena. In the context of Dadaab, this paradigm facilitates an inquiry not merely into whether health education affects food security, but how and why this relationship operates amid intersecting social, legal, institutional, and environmental factors.

Critical realism also legitimizes the integration of both quantitative and qualitative data, allowing the study to trace how underlying mechanisms such as restrictive refugee policies, gendered labour divisions, or fragmented service delivery mediate the impact of health education initiatives. This philosophical orientation aligns with the research objective of producing context-sensitive, explanatory insights that go beyond surface-level correlations to reveal the conditions under which health education can effectively enhance food security in protracted displacement settings. Ultimately, the use of critical realism enables a more robust and actionable understanding of

intervention dynamics, guiding more equitable and sustainable program design in humanitarian contexts.

2.3 Summary and Research Gap

The reviewed literature establishes a growing consensus on the role of health education in improving food security, particularly through pathways related to nutrition knowledge, behavioural change, and household-level practices. Studies from Bangladesh (Ismail, 2020), Nigeria, and Kenya consistently show that education interventions especially those targeting women and adolescent girls can increase awareness, shift attitudes, and strengthen food utilization capacities. When combined with structural supports such as conditional cash transfers, kitchen gardening, and child growth monitoring, these interventions also promote long-term resilience and self-reliance.

However, despite these promising findings, important gaps remain. Much of the existing research is situated in stable or development-focused environments, limiting its transferability to humanitarian settings marked by displacement, institutional fragility, and chronic resource constraints. Moreover, relatively few studies interrogate the structural barriers such as insecure legal status, entrenched gender norms, or governance fragmentation that mediate the uptake and effectiveness of health education in refugee contexts. Even recent frameworks like One Health (Garcia et al., 2020) and food systems approaches (Singh et al., 2022), while conceptually valuable, often lack clear operational guidance for application in refugee-hosting areas like Dadaab, where autonomy is limited, and services are heavily donor-dependent.

This study addresses these gaps by situating its analysis within the socio-legal and ecological specificities of Dadaab and by adopting a critical realist lens to investigate the mechanisms that enable or inhibit the impact of health education on food security. In doing so, it contributes both theoretically and practically to ongoing debates in public health, humanitarian programming, and development policy. It offers a nuanced perspective that foregrounds structural context, agency constraints, and institutional complexity, thereby enriching the discourse on how health education can be leveraged more effectively to improve food security outcomes among displaced and marginalized populations.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The chapter provides an overview of the research design, study site, the target population, study sample, sampling procedure, study sample size, sampling techniques, exclusion and inclusion criteria, data collection instruments, instrument reliability and validity, data collection procedures, data processing and analysis and legal and ethical consideration.

3.2 Research Design

This study adopted descriptive research design to explore the dynamics of health education on food security in the Dadaab camp in Kenya. The study gathered information about the prevailing situation related to health education on food security in terms of the system process and impact in Dadaab refugee camp. This used concurrent mixed research methods which combine both qualitative and quantitative studies into one research.

3.3 Study Site

The study was conducted in Dadaab camp and surrounding host community within 5 Kilometres radius. Dadaab refugee camp being the second oldest refugee camps in Kenya has undergone periods of transformation such as increase in number of camps from 3 to 5 in 2011 to 2013 to accommodate additional population of new arrivals fleeing from drought in Somalia, closure of two camps following Kenyan government directive to repatriate refugees back to Somalia and the recent reopening of Ifo 2 camp following influx of new arrivals from Somalia (Ref). Seasonal climate variations, farming patterns, opportunities and diseases in Dadaab result in a cyclical pattern of inadequate access and availability of food (Aouinti et al., 2024). The camp's location in a flood plain zone, at an insecure border point inhibited by Al-Shabaab, in a Semi-arid area and settled by vulnerable refugees who are encamped with limited access to mobility and land makes the area highly food insecure (Aouinti et al., 2024). Health education programmes in Dadaab refugee camp are delivered across all thematic areas of the sphere standards including food security (UNHCR Sphere standards, 2012). In alignment with the 2022 refugee act which advocates for host and refugee integration as a durable solution, the delivery of the health education under such arrangements is dynamic (Kenya, 2022).

3.4. Target Population

The study was conducted in Dadaab refugee camp in Kenya targeting host community and refugee households, humanitarian workers and refugees working in organizations providing health education. The table below represents the target population:

Table 1 Target population and sample of households drawn from Dadaab population statistics (Source: Kenya Refugee Statistics, 2024)

Camp	Female	Male	Total Individuals	Total HHs	HH sampled Out
Dagahaley	51,445	48,430	99,875	20,141	102
Hagadera	67,831	64,484	132,315	25,669	129
Ifo	45,136	44,454	89,590	17,053	86
Ifo2	38,773	36,792	75,565	13,316	67
Total	203,185	194,160	397,345	76,179	384

The study targeted employees in health care and food security sectors who are the implementers, refugees, and host communities who are beneficiaries of these services, managers of organizations and board members who are the decision-makers. The number of key Informant interviews and Focus Group Discussion respondents to be interviewed was purposively selected as below:

Table 2 Sample of Focus Group Discussion Participants Distributed per Camp

Target Group	Hagadera Camp	Ifo Camp	Dagahaley Camp	Ifo 2 Camp
Adult women (incl. Somali, South Sudanese, Ethiopian, Great Lakes, traders, self-reliance beneficiaries, host community, and PWD)	1	1	1	1
Adult men (same representation as above)	1	1	1	1
Male youth (same representation as above)	1	1	1	1
Female youth (same representation as above)	1	1	1	1
Elderly male (same representation as above)	1	1	1	1
Elderly female (same representation as above)	1	1	1	1
Pregnant and lactating women (same representation as above)	1	1	1	1
Total Number of FGDs	7 FGDs	7 FGDs	7 FGDs	7 FGDs

Given the complex nature of Dadaab camp, the use of varied methods for data collection from varied entities enabled the collection of robust evidence that enabled real-life understanding of the implementation of health education on food security. Focus Group discussions complemented gaps identified in the quantitative data collection exercise as well as enriched the study with additional perspectives from the selected participants.

Table 3 Sample Key Informant Interviews from Selected Humanitarian Organizations and Government Entities

Category	Sub-Groups	Number of Participants
Key Community Representatives	Male and female Camp/Administrative Leaders	2
	Male and female Food Advisory Committee (FAC) Representatives	4
	Religious Leaders	2
	Male and female Youth Leaders	2
	Male and female Persons with Disabilities (PWD) Representatives	2

	Traders (Male and Female)	8
	School Management Committee (Male and Female)	4
WFP	WFP Staff	2
WFP Cooperating Partners	Relief Reconstruction and Development Organization (RRDO)	1
	CARE	1
	Lutheran World Federation (LWF)	1
	International Rescue Committee (IRC)	1
	Kenya Red Cross Society (KRCS)	1
	FilmAid Kenya (FAK)	1
Other Stakeholders	United Nations High Commissioner for Refugees (UNHCR)	2
	Humanity & Inclusion (HI)	1
	Halgan	1
	Monyqadow	1
Government Partners	Department of Refugee Services (DRS)	1
	Police (Male and Female)	2
Total		40 Participants

3.5 Study Sample

3.5.1 Sampling Procedure

The primary sampling unit for the study was the four camps in Dadaab (Dagahaley, Hagadera, Ifo N and Ifo 2) referred to in the study as the clusters. Both the household and individual population sizes per cluster/ camp were listed. However, the household population was the secondary sampling unit. The cumulative sum of the household population was established and the number of household population to be sampled from each cluster was determined. The same number of households was sampled from the selected blocks to ensure the same probability of selection.

Sampling of refugee workers, community leaders, humanitarian workers and government officials was purposive. Focus Group Discussion and Key Informant Interviews were conducted for qualitative data collection while Individual Questionnaires were administered for quantitative data collection. Key Informant and focus group participants come from various sectors, including education, health, business, religious organizations, and community leadership. This diversity highlights the multifaceted nature of community governance and the importance of collaboration among different stakeholders. The variety of roles within the Dadaab community illustrates a

complex network of leadership and governance. This diversity is essential for addressing the multifaceted challenges faced by residents, from education and health to economic stability and social justice.

3.5.2 Study Sample Size

The required sample size used was calculated based on Fischer equation for small populations (Fischer et al, 1963).

$$N = Z^2 pq / d^2$$

Where, N= desired sample size

Z= Standard normal deviation set at 1.96 (95% confidence level)

p= Proportion of the targeted population with the characteristic of interest estimated at 50%.

q=1-p which is the proportion of the targeted population without the characteristics of interest.

d= degree of accuracy set at 0.05 (5%)

$$\text{Thus } n = 1.96^2 * (0.5 * (1 - 0.5)) / (0.05)^2$$

Hence,

$$n = (1.96^2 * 0.5 * 0.5) / (0.05^2) = 384.16$$

$$n = 384.16$$

=385 Household representatives were sampled out for household questionnaires.

Of the 385 household respondents, 269 were female, 115 were male, and 1 preferred not to disclose their gender. Respondents were primarily heads of households or senior members, although in special cases, youths, persons with disabilities, the elderly, and emancipated minors were also included to enrich relevant study variables. In contrast, participants for Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) were selected using purposive sampling and were not drawn from the 385-household sample. A total of 28 FGDs were conducted, each comprising 8–10 participants, resulting in approximately 225 participants overall. FGDs were organized to ensure balanced representation across key social categories. Each group was sex-disaggregated where appropriate to ensure open participation and gender-sensitive data collection. The selection aimed to gather nuanced perspectives across demographic, functional, and community roles. Additionally, 43 Key Informant Interviews (KIIs) were conducted with key stakeholders selected through purposive and expert sampling, based on their institutional knowledge and relevance to the study objectives. These included representatives from government agencies, humanitarian

organizations (NGOs and UN agencies), the business community (retailers and market actors) and Community leadership structures including refugee leaders, religious leaders, and camp management personnel.

3.5.3 Sampling Techniques

The study employed Probability Proportional to Size (PPS) sampling to ensure equitable representation of households based on the population size of each camp. PPS is a sampling technique where larger clusters, in this case, refugee camps with more households, are allocated a proportionally larger number of samples. The four camps included were Hagadera (most populated), Dagahaley, Ifo 1, and Ifo 2 (least populated), with each assigned a sample size corresponding to its household population. The total sample comprised 385 households, primarily targeting heads of households or senior members. In special cases, youths, persons with disabilities, the elderly, and emancipated minors were also included to enrich specific study variables. A comprehensive sampling frame was developed, detailing the number of households in each section and block across all four camps. Using PPS, a proportional number of households were allocated per camp, after which simple random sampling was employed to select specific households within each section and block, ensuring randomness and representativeness. To capture institutional and leadership perspectives, purposive sampling was used to select key informants from government bodies, NGOs, community refugee leaders, and camp workers. Section leaders, through the support of the Department of Refugee Services, played a key role in mobilizing and guiding the identification of households for interview.

3.5.4 Inclusion Criteria

Participants were included in the study if they were aged 18 years and above. Eligible participants resided in any of the four refugee camps in Dadaab: Hagadera, Dagahaley, Ifo 1, or Ifo 2 or within the surrounding host community at the time of data collection. All participants were required to provide informed consent, be available during the data collection period, and demonstrate the cognitive and emotional capacity to engage meaningfully in interviews or focus group discussions. The study targeted a range of groups, including heads of households or senior household members, youths (aged 18–35 years), elderly individuals, persons with disabilities, refugee representatives, community leaders, and personnel from government and humanitarian organizations operating in Dadaab.

3.5.5 Exclusion Criteria

The study excluded managers and employees with less than 6 months of experience in the respective thematic groups.

3.6 Data Collection

3.6.1 Data Collection Instruments

Qualitative and quantitative methods were used to gather data for this project. To gather quantitative data from 385 families that were randomly selected, a household questionnaire was administered. Purposively sampled government staff, humanitarian workers, refugee and host community employees and community leaders were administered using Focus Group Discussion qualitative tool and Key Informant Interviews (Table 1.0; Table 2.0).

Table 4 Summary of Data Collection Instruments

Data Collection Tool	Type of Questions	Where administered	How Administered	Variables Covered
Household Questionnaire	Closed-ended / Structured	385 sampled households. In cases of insecurity, administered at service delivery points.	Quantitatively by enumerators	(i) Socio-demographic Information (ii) Health Education Strategies (iii) Nexus between participation in health education and food security (iv) Barriers to success
Key Informant Interview	Unstructured	43 key informants from government, humanitarian actors, business community, and community leadership	Qualitatively by enumerators	(i) Key informant background (ii) Health Education Strategies (iii) Nexus between participation in health education and food security (iv) Barriers to success
Focus Group Discussion	Unstructured	28 FGDs (7 from each camp)	Qualitatively by enumerators	(i) Group profile (ii) Health Education Strategies (iii) Nexus between participation in health

			education and food security (iv) Barriers to success
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The KII guide focussed on key areas of concern and were brief to allow adequate time for the key informant to articulate the questions before providing feedback. The tool was pretested before its adoption to a larger number of participants. The key thematic areas in the key informant interview guide were drawn from the specific objectives; health education strategies on food security, the nexus between health education and food security, and barriers hindering the success of health education in food security.

The KII guide was discussed with the research team before and after the pretest and a decision was made on whether to retain all questions or remove some. An informed consent form was read to participants who were then asked to sign before the interview is administered. A hybrid approach (Physical or remote interview) was employed to accommodate interview participants who were not available for a physical interview. A simplified language was used when asking questions to ensure they are well understood. Ethical standards were maintained, and two enumerators assigned per participant where one asked the questions while the other records the responses in ODK and some in writing. Both structured (rating scales) and unstructured questions were used. The interview moderator asked probing questions where necessary.

Focus Group Discussions with Community representatives (Leaders, Community Health Workers, Pregnant and Breastfeeding Women and Girls and the Youths) were conducted to enable deeper understanding of the specific objectives including intermediate variables such as political good well, policy and guidelines, social and cultural environment, capacities, quality in services delivered and participation.

Focus Group Discussion (FGD) facilitators and note takers were recruited and trained. The following selection criteria was considered: fluency in the community language or the capacity to work with an interpreter; proficiency in pretesting the tool; prior practice with FGD questions; a well-organized venue; participants chosen at random; and increased privacy and confidentiality. The number of participants per FGD was limited to 6-12 members from diverse groups (People with disability, women, men, youth and elderly representatives) who are able to articulate health

education on food security concerns. Feedback on the findings was provided to community leaders and representatives.

3.6.2 Pilot testing of Research Instruments

The respondents targeted for the pretest were 30 from blocks located in the outskirts of the refugee camps excluded from the selected target population. The choice of the pilot area ensured results from the pretest were not skewed from the representative sample in the study, given they were both selected from the same area but different sections and blocks hence homogeneity. Pre-testing of the instruments was conducted to ensure that they are free of any factors that might compromise the validity, reliability, and accuracy of the data collected, such as unclear instructions or inconsistent question phrasing.

Diverse populations formed the respondents for household questionnaires, key informant interviews and focus group discussions. Both male and female, youths, people with disability, the elderly among others from different cohorts of age were sampled. Results indicated varied levels of education, with the majority reporting lower literacy levels.

Participants were enthusiastic and showed interest to participate in the study. This is reflected by the 100% response rate where over 384 respondents participated. However, some enumerators who reported incomplete data were discontinued and their data removed. Facilitators in one of the camps for the Key informants with community representatives were also discontinued and a different group retrained as they had taken up multiple contracts for work that was overlapping with the study.

Enumerators were recruited from the local community and based on minimum academic qualification hence administered the questionnaire using the language understood by the respondents. Mobilization and selection of study participants considered cultural dynamics such as separate focus group discussions based on gender and age cohorts were administered. Section and block leaders formed part of community mobilizers who were identifying households to be visited. This ensured ease in community entry.

Correlation coefficient of 30 households that were representatives for the pretest was conducted. A matrix indicating pretest (conducted on day 1 of data collection) and post-test results (conducted

on day 2 of data collection) indicated strong correlation for variables that were pretested ranging from 65% to 70%.

3.6.3 Instrument Reliability

The research evaluated the dependability and consistency of the study results by using the test-retest technique, which involves administering questionnaires at two intervals to test the reliability of the study instruments. The tool was administered in the same group twice but at different time intervals (Two assessments done on the same group). Reliability estimates were obtained based on observations and correlations drawn from the two assessments. This allowed for identification of areas in the methodology used that are likely not to be representative of the study in question and the intended function of the study results over time.

The reliability test involved measuring both results of the assessments against the objectives to be met in the study while ensuring the correlations are within the acceptable thresholds. The reliability test plan considered environmental conditions, study logistics, stress levels, prevailing scenarios, and others likely to arise. When testing the plan, the questionnaire was executed among the identified sampled population and this involved administering the questionnaire in varied environmental conditions and review provided feedback related to the bulk of the questions, stress levels of participants, response time for the questionnaire and the throughput.

A pilot study involving 30 participants residing on the periphery of the four refugee camps was undertaken to assess the reliability of the survey instrument. Fifteen questionnaires were administered across Ifo 2 and Dagahaley camps, and an additional fifteen in Hagadera and Ifo 1 camps. The primary objective was to evaluate the internal consistency of multi-item scales measuring key constructs related to health education—namely, awareness, delivery preferences, satisfaction, perceived informativeness, participation, adoption, perceived impact, and perceived barriers. Internal reliability was assessed using Cronbach's Alpha, focusing on Likert-scale items embedded within the household questionnaire (N = 30).

As shown in Table 5, most constructs yielded Cronbach's Alpha values above the conventional threshold of 0.70, indicating acceptable to good internal consistency (Taber, 2018). The scales for Awareness of Health Education Strategies and Participation in Health Education demonstrated the highest reliability ($\alpha = 0.812$), suggesting strong coherence among items measuring these constructs. Constructs related to Preference, Satisfaction, Perceived Informativeness, and

Adoption also showed acceptable reliability (α ranging from 0.721 to 0.796), supporting their suitability for further statistical analysis. However, the scale measuring Socio-demographic Influences on Understanding returned a lower reliability coefficient ($\alpha = 0.654$), indicating borderline internal consistency. As a result, items such as gender, education level, and primary food provider were excluded from scale-based analysis and instead treated as independent control variables in the main study.

Table 5: Reliability Coefficients (Cronbach's Alpha) for Main Constructs

Construct	No. of Items	Cronbach's Alpha	Interpretation
Awareness of Health Education Strategies	4	0.812	Good
Preference for Delivery Approaches	4	0.796	Acceptable
Satisfaction with Health Education	2	0.733	Acceptable
Perceived Informativeness	2	0.721	Acceptable
Participation in Health Education	5	0.812	Good
Adoption of Health Education Messages	4	0.784	Acceptable
Perceived Effectiveness and Impact	3	0.821	Good
Awareness of health education delivery approaches	4	0.762	Acceptable
Satisfaction and Perception of Health Education	6	0.811	Good

Perceived Barriers to Health Education Delivery	5	0.701	Acceptable
Socio-demographic influences on understanding	6	0.654	Questionable Borderline

3.6.4 Instrument Validity

The research checked the instruments' internal and external validity. According to Kaya (2015), a study possesses internal validity when the observed effects can be confidently attributed to the independent variables, without influence from any external or confounding factors. Internal validity was enhanced by minimising the influence of investigator bias and controlling for other confounding factors. This was done by randomly sampling households participating in the study, randomly assigning data collectors (enumerators) to different locations, use of similar questionnaire guides, ensuring equality in participation by different age groups and gender, adopting within-subject design to control individual differences, blinding to ensure respondents and enumerators are unaware of certain conditions, pilot testing before the main study and use of statistical controls such as analysis of covariance.

To guarantee that the study's results are externally valid, the researchers employed simple random sampling to choose participants. Researchers and supervisors jointly reviewed the study instruments.

3.6.5 Data Collection Procedures

The quantitative data was collected using standardized questionnaire. Research enumerators were recruited from the surrounding host and refugee community to administer questionnaire tools to the study population. Study population was asked whether they have participated in a health education on food security or not. Follow-up questions on either of the responses was asked with a view to understand this variable in detail. Study participants were asked about the health education strategies currently existing in the camp in relation to the food security pillars (Food access, food utilization, food availability and food stability). Key factors contributing to the successful delivery of health education on food security was also asked in both qualitative and

quantitative tools.

Key informant interviews with representatives from the government workers, humanitarian organizations, Community leaders, Community Health Workers, traders and school board of management were sampled and qualitative data collected from them.

Quantitative Data relied on questionnaires converted into digital format and administered through Kobo Collect in an Open-Data kit; an online platform used to develop digital questionnaire tools with questions designed specifically for different respondents.

First, descriptive statistics was determined to break down the sample data into its component parts and show how often things like percentages of households with certain traits and changes in those traits appear (ii) A comparative analysis using the Linkert scale was conducted to evaluate for awareness, preferences, knowledge and information regarding health education on food security and lastly (iii) Examining the relationship between health education and food security using model analysis employing logic or linear regressions. The purpose was to understand if health education on food security has delivered the desired results or not.

3.7 Data Processing and Analysis

Following the standard approach for processing and analysing data in both quantitative and qualitative research, the research report was written after data collection and analysis. For quantitative data, descriptive and inferential statistics was used with Excel and STATA software. Descriptive statistics characterized the study population based on the specific camps they reside in, whether they are new arrivals, registered refugees or host community, by age, organizations they work for if any, marital status, source of income and the gender. Inferential statistics on the other hand assessed the relationship/ association between participation in health education and food security pillars (Food access, food availability, food utilization and food stability). Health education strategies on food security that are most preferred by refugees, host community and camp workforce were established as well as barriers in health education and food security. Qualitative data used thematic content analysis where short summaries of KIIs and FGDs were compiled and access themes on health education strategies, participation in health education and barriers in health education on food security were analysed. Presentation of data will be done using tables, charts, and graphs.

3.8 Legal and Ethical Consideration

Ethical considerations were factored given that human subjects were the research participants. Approvals were sought from African Nazarene University (ANU). A research permit from National Commission for Science, Technology, and Innovation (NACOSTI) was sought as well as authorization from United Nations High Commissioner (UNHCR). Informal consent was administered to participating subjects and their privacy and confidentiality ensured. Data protection policy was complied.

CHAPTER FOUR: DATA ANALYSIS AND FINDINGS

4.1 Introduction

This chapter presents the findings from the study on health education dynamics related to food security in the Dadaab refugee camp. The analysis is based on household questionnaires, focus group discussions, and key informant interviews, covering several key themes: Socio-demographic Information: This section provides demographic details about the participants, offering context for the study. Current Health Education Strategies: Here, we examine the various health education approaches currently being implemented to enhance food security among households. Knowledge and Preferences: This part assesses the participants' understanding of these strategies and their preferences regarding health education methods. Participation and Food Security Nexus: This analysis explores how engagement in health education correlates with improved food security outcomes. Barriers to Effective Delivery: This section identifies challenges faced in delivering health education, including logistical, cultural, and resource-related obstacles. Additionally, the chapter triangulates these findings with secondary data referenced in the literature review and other relevant information gathered during the data collection process. This comprehensive approach ensures a robust understanding of the dynamics at play in the Dadaab refugee camp concerning health education and food security.

4.2 Response Rate

The study achieved an effective sample size of 385 completed and valid household interviews, which aligns with the predetermined target for statistical analysis. While a total of 446 interviews were initially conducted, 30 were designated for pretesting and 31 were incomplete and therefore excluded from the final dataset. These exclusions ensured data quality and methodological rigor. Thus, the final response rate is based on 385 analysable responses, consistent with the calculated sample size required to achieve the study's objectives. Figure 4 presents the response breakdown, clearly distinguishing between the total interviews conducted and the final valid sample used for analysis.

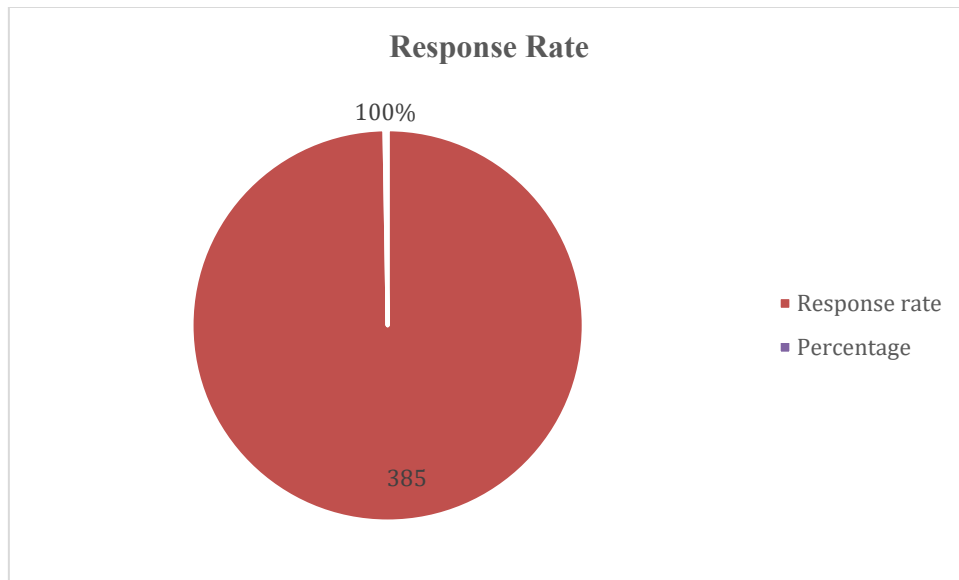


Figure 4 Response breakdown between total interviews conducted and final valid sample used for analysis

The Key informant interview responses indicate that a significant portion of participants identify as representatives of various food assistant humanitarian organizations (18 out of 43). The responses regarding representation in health and nutrition humanitarian organizations reveal that 8 out of 43 identified as representatives of health and nutrition organizations. A total of 14 participants (out of 43) indicated that they are representatives of education-focused humanitarian organizations. This reflects a moderate level of engagement in educational initiatives. Only 6 participants (out of 43) identified themselves as representatives of communication-focused humanitarian organizations. The limited representation highlights an opportunity for increased emphasis on communication initiatives within the humanitarian context, which could enhance information dissemination and community engagement.

A total of 9 participants identified themselves as representatives of the Ministry of Education out of 43 responses, indicating low engagement from this sector. The low number of representatives highlights the need for increased awareness on the potential role the Ministry can play in health education. A total of 11 participants identified themselves as representatives of Camp Coordination organizations out of 43 responses. This suggests a relatively better presence compared to some other sectors. Out of 43 respondents, only 5 identified as representatives of the Ministry of Health. This indicates a significantly low presence of health officials within the discussion.

Only eight respondents identified as a representative from the private sector who were providers of health, education, and food services. Eighteen respondents identified themselves as representatives from camp leadership, showing a greater level of representation from camp leadership, which is crucial for effective governance. Nine responses were provided under "Others," indicating some diversity in representation. They were representatives from the business community, people living with disability, emancipated minors, representatives from the host community and representatives from the minority community.

4.3 Presentation of research analysis and findings

4.3.1 Socio-demographic Information

The findings from Table 6 on Socio-demographic information reveal important trends among the 385 study participants in Dadaab refugee camp. A significant gender imbalance is noted, with females comprising 69.9% of respondents. Most participants are long-staying refugees (70.4%). The age distribution indicates a predominance of young (46.5%) and middle-aged adults (48.8%), with only 4.7% over 60. Geographically, respondents are evenly distributed across the camps, with Hagadera having the highest representation (33.8%).

Economic vulnerability is a significant concern, with over half (55.6%) reporting no access to income. The marital status data shows that a large majority (79.4%) are married. Educational attainment is particularly alarming, with 72.4% lacking formal education. The overwhelming reliance on food aid is another key finding, with 78.4% of households depending on rations from the World Food Programme (WFP).

Table 6 Socio-demographic information

Variable	Category	Frequency (n=385)	Percentage (%)
Sex	Male	115	29.9
	Female	269	69.9
	I prefer not to say	1	0.3
Categories of Beneficiaries	Long-staying refugees	271	70.4
	Newly arrived refugees/asylum seekers	114	29.6
Age Group	Young adults (18–39 years)	179	46.5
	Middle-aged adults (40–59 years)	188	48.8
	Older adults (60+ years)	18	4.7
Camp of Residence	Dagahaley	86	22.3
	Hagadera	130	33.8
	Ifo 1	85	22.1
	Ifo 2	84	21.8
Access to Income (Self, Relatives, Friends, Employment)	No	214	55.6
	Yes	171	44.4
Marital Status	Married	305	79.4
	Divorced	61	15.9
	Widowed	13	3.4
	Separated	5	1.3
Level of Education	None	278	72.4
	Primary school	53	13.8
	Secondary school	32	8.3
	Traditional/Informal	14	3.6
	Post-secondary school	7	1.8
Main Source of Food	Food aid ration	302	78.4
	Direct purchases from traders	51	13.2
	Cash-based transfer (Bamba Chakula)	29	7.5
	Borrowing	2	0.5
	Farming (crop or animal)	1	0.3
Main Provider of Food	World Food Programme	356	92.5
	Employed/Own production	10	2.6
	Friends and relatives	5	1.3
	Farming/Own production	3	0.8

4.3.2 Assessing Health Education Strategies on Food Security in the Dadaab Refugee Camp.

4.3.2.1 Awareness on strategy/approaches used for delivery of health education on food security.

The results from Table 7 indicate a diverse range of preferences among the 385 respondents regarding how they would like to receive health education on food security. A significant portion of participants (35.1% preferred and 9.6% most preferred) indicated a positive inclination towards facility-based approaches involving health providers and NGO workers. However, a notable percentage also expressed disinterest, with 17.1% not preferring and 19.0% least preferring this approach.

The responses indicate varying levels of awareness, with 27.9% of participants reporting they are "very aware" and 9.7% "extremely aware." However, a notable 24.0% reported being "not at all aware." Like facility-based approaches, awareness levels for institution-based approaches are moderate. A combined total of 27.9% reported being "very aware," and 10.7% were "extremely aware." However, 23.8% reported being "not at all aware."

Community-Based Strategy category shows the highest levels of awareness, with 29.1% of participants reporting "very aware" and 11.8% "extremely aware." Only 22.6% reported being "not at all aware." The technology-based approaches showed similar trends to the facility and institution-based strategies, with 26.1% of participants being "very aware" and only 9.5% "extremely aware." However, 24.3% reported being "not at all aware."

The institution-based strategies, which include curriculum integration and capacity building, received moderate support, with 31.8% preferring and 13.1% most preferring this method. However, 20.5% indicated they do not prefer this approach. Community engagement strategies garnered substantial support, with 34.0% preferring and 17.4% most preferring these approaches. The relatively lower levels of non-preference (13.2% not preferred and 17.9% least preferred) indicate a stronger connection to community-based initiatives. Technology-driven methods showed a mixed response, with 29.0% preferring and 11.3% most preferring these strategies. However, a significant percentage (17.4% not preferred and 23.7% least preferred) indicates scepticism or barriers to technology use, such as access issues or digital literacy.

Table 7 Respondents' awareness on the strategy/approaches used for the delivery of health education on food security.

Strategy (N=385)	Not at all aware	Slightly aware	Moderately aware	Very aware	Extremely aware
Facility-Based (Health providers, NGO workers)	92 (24.0%)	83 (21.7%)	64 (16.7%)	107 (27.9%)	37 (9.7%)
Institution-Based (Schools, training, curriculum)	91 (23.8%)	91 (23.8%)	53 (13.8%)	107 (27.9%)	41 (10.7%)
Community-Based (Engagement, dialogues, campaigns)	86 (22.6%)	78 (20.5%)	61 (16.0%)	111 (29.1%)	45 (11.8%)
Technology-Based (Mobile apps, SMS, social media)	92 (24.3%)	84 (22.2%)	68 (17.9%)	99 (26.1%)	36 (9.5%)

4.3.2.2. Findings on preferred approaches/strategies for receiving health education on food security

As indicated in Table 8, a substantial portion of respondents reported varying levels of satisfaction with current health education strategies (Not at all satisfied: 17.7%, Slightly satisfied: 19.7%, Moderately satisfied: 25.7%, Very satisfied: 25.2% and completely satisfied: 11.7%). Overall, while 36.9% of participants are "very" or "completely satisfied," a combined 37.4% expressed low satisfaction (either "not at all" or "slightly satisfied").

Table 8 Most preferred approaches/ strategies for receiving health education on food security

Strategy (N=385)	Not Preferred	Least Preferred	Somewhat Preferred	Preferred	Most Preferred
Facility-Based (MoH, NGO workers)	66 (17.1%)	73 (19.0%)	74 (19.2%)	135 (35.1%)	37 (9.6%)
Institution-Based (Schools, training)	78 (20.5%)	76 (19.9%)	56 (14.7%)	121 (31.8%)	50 (13.1%)
Community-Based (Engagement, dialogues, campaigns)	50 (13.2%)	68 (17.9%)	66 (17.4%)	129 (34.0%)	66 (17.4%)
Technology-Based (Apps, SMS, social media)	66 (17.4%)	90 (23.7%)	70 (18.5%)	110 (29.0%)	43 (11.3%)

4.3.2.3 Satisfaction and Perceptions on Health Education Strategies

The responses indicate a moderate perception of the effectiveness of health education strategies (30.1%) as indicated in Table 9 below. With 53.2% of participants perceiving the strategies as "moderately" to "very informative," there is a positive outlook. However, 36.4% view them as only "not at all" or "slightly informative," indicating a need for more engaging and impactful educational content.

Table 9 Satisfaction and Perceptions related to Health Education Strategies

	Total N=385
How satisfied are you with the current health education strategies used?	
Not at all satisfied	68 (17.7)
Slightly satisfied	76 (19.7)
Moderately satisfied	99 (25.7)
Very satisfied	97 (25.2)
Completely satisfied	45 (11.7)
How do you perceive the use of these strategies in the delivery of health education on food security in the refugee camp and its surrounding	
Not at all Informative	52 (13.5)
Slightly Informative	88 (22.9)
Moderately Informative	116 (30.1)
Very Informative	89 (23.1)
Extremely Informative	40 (10.4)

4.3.2.4 Standard in the Delivery of Health Education on Food Security Pillars

Only 34.7% of respondents believe food utilization meets or exceeds standards, while 45.8% express concerns about food utilization being below acceptable levels. A combined total of 48.7% of respondents feel that food accessibility is below standards, with only 30.2% believing it meets or exceeds them. Like accessibility, 52.6% perceive food availability as below standards, with only 24.7% feeling that availability meets expectations. The data shows that 56% of participants feel food stability is lacking.

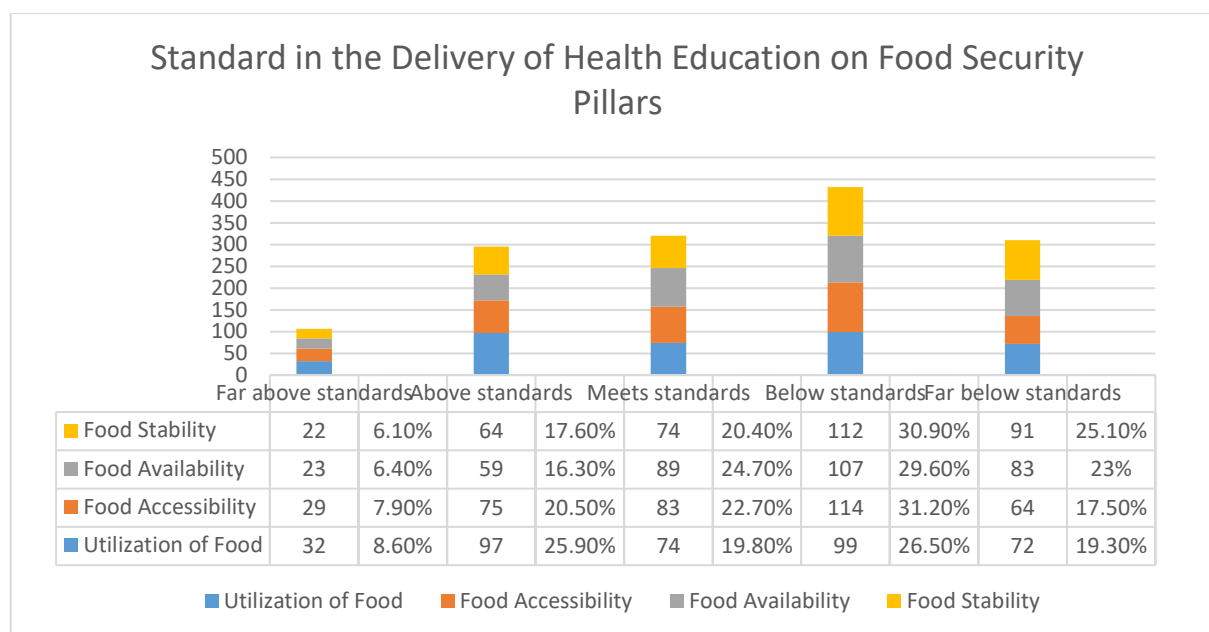


Figure 5 Standard in the Delivery of Health Education on Food Security Pillars

4.3.3 Nexus Between Participation in Health Education and Food Security in The Dadaab Refugee Camp

4.3.3.1 Understanding and reception of health education on food security

In Table 10 below, the data reveals that slightly more than half of the respondents (52.5%) understand what health education on food security means. However, a significant portion (47.5%) does not. Among those who do understand health education, 63.7% are aware of organizations providing it. Nonetheless, 36.3% of respondents are not aware of the organizations.

The responses about how often participants receive health education on food security show a diverse picture: A combined total of 43.8% of respondents receive health education infrequently while 24.2% indicates some regularity. Only 32.1% of respondents receive education on a more consistent basis. 46.2% of participants expressing a wish to receive it "always" and 27.7% wanting it "often."

Table 10 Understanding and Reception of Health Education on Food Security

	Total N=385
Do you understand what health education on food security means?	
No	183 (47.5)
Yes	202 (52.5)
If yes, are aware of the organizations or entities providing health education on food security?	
No	73 (36.3)
Yes	128 (63.7)
How often do you receive health education on food security?	
Never	76 (19.8)
Rarely	92 (24.0)
Sometimes	93 (24.2)
Often	69 (18.0)
Always	54 (14.1)
How often would you like to receive health education on food security?	
Never	28 (7.4)
Rarely	29 (7.7)
Sometimes	42 (11.1)
Often	105 (27.7)
Always	175 (46.2)

4.3.3.2 Participation in health education on food Security

A significant portion of respondents (28.5%) reported receiving health education on food utilization frequently, with an additional 10.2% indicating very frequent exposure. Despite the higher frequency of education, a considerable number of participants (21.9% very rarely and 20.6% rarely) reported minimal engagement with this pillar. Accessibility shows the highest percentage of respondents (33.4%) who reported receiving health education rarely.

Only 22.6% of respondents indicated frequent education on accessibility, with 6.7% reporting very frequent education. Food availability received a balanced distribution of responses, with 27.4% indicating rare education and 24.2% very rarely. The frequent and very frequent responses total 21.5% and 6.7%, respectively. Food stability recorded the highest levels of very rare (24.6%) and rare (31.1%) responses. Only 14.9% reported frequent education, and just 9.7% claimed very frequent exposure.

The figure below shows feedback on food security pillar that received highest level of health education.

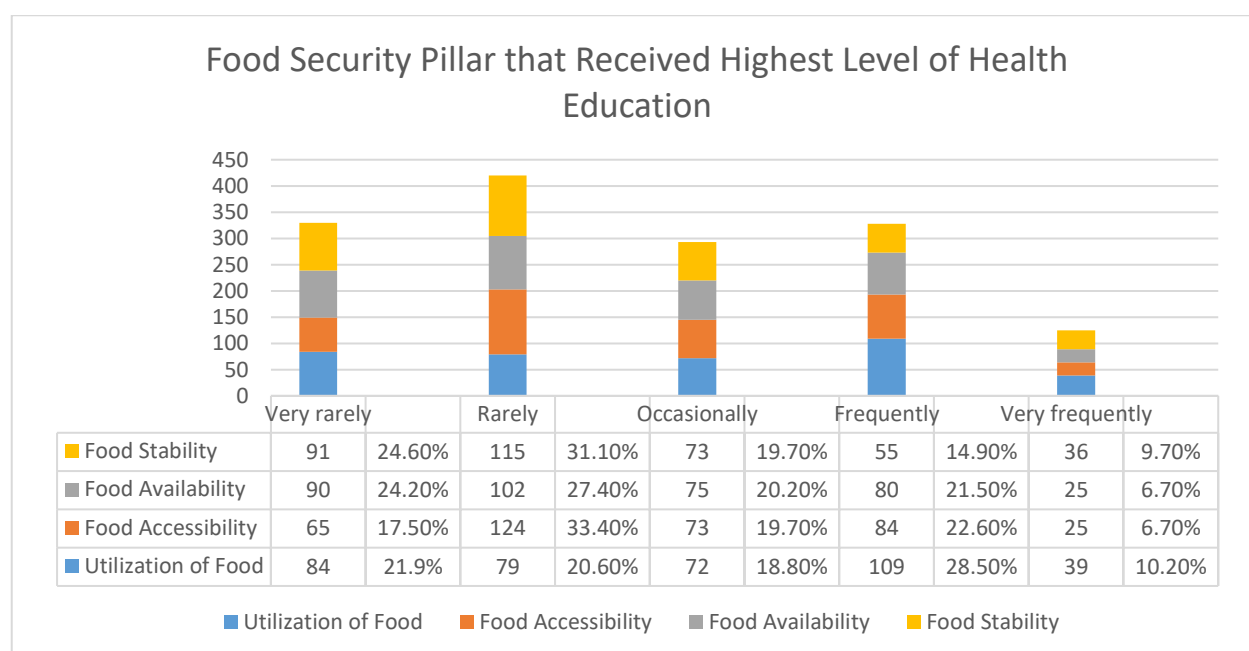


Figure 6 Food Security Pillar that Received Highest Level of Health Education

4.3.4 Barriers to Successful Delivery of Health Education on Food Security

4.3.4.1 Key factors hindering the successful delivery of health education on food security

Figure 4 illustrates the key factors hindering the successful delivery of health education on food security, based on 385 responses analysed. The findings are as follows: Economic Shock: 86%, Social Barriers: 59.2%, Access Barriers: 42.6%, Governance: 29.6% and Cultural and Religious Factors: 29.4%. The study by Aubery and Buisson, (2024) supports these findings, highlighting that refugees face significant challenges, including movement restrictions, limited access to

economic activities, dependence on aid, and constrained opportunities for income generation and land access.

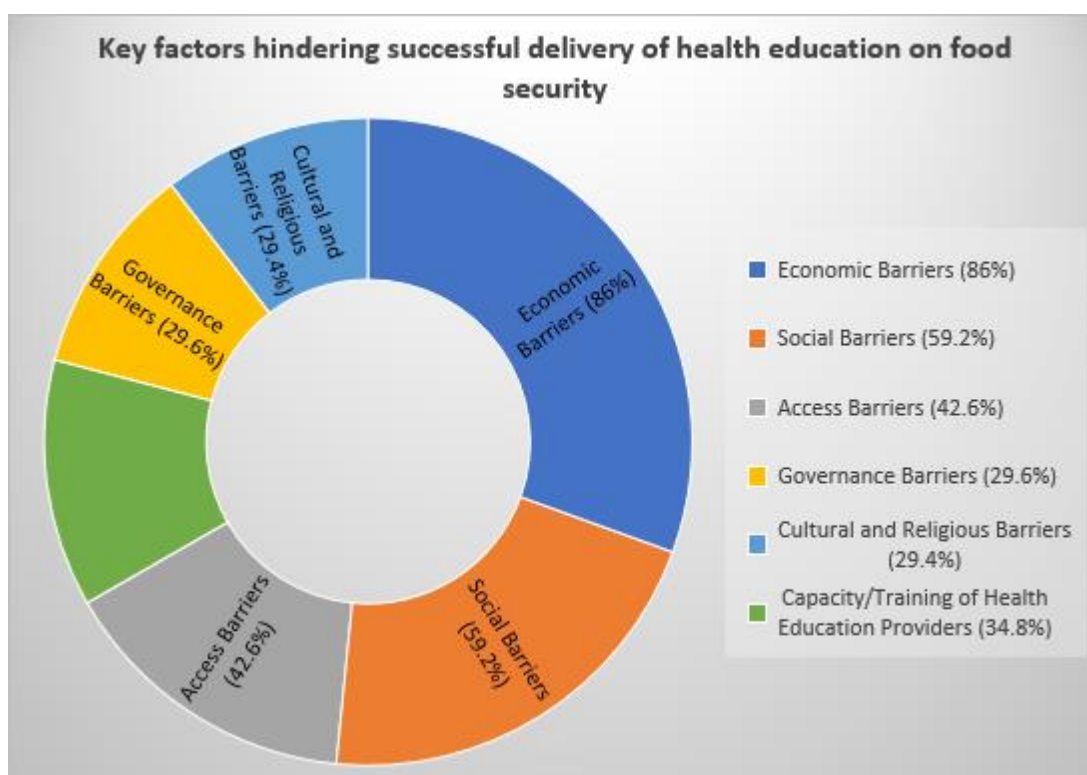


Figure 7 Key factors/barriers hindering the successful delivery of health education on food security in the camp (n=385)

4.3.4.2 Stakeholders recommendations for improved delivery of health education on food security

The data in figure 5 below presents several recommendations aimed at improving health education strategies on food security, along with the percentage of respondents who agreed with each recommendation. Increased funding for health education strategies (75%) received the highest percentage responses, indicating a strong consensus on the necessity of increased funding. It suggests that stakeholders recognize the financial constraints currently limiting effective health education on food security.

Review health education guidelines or policies (50% indicates a perceived need for updates or revisions to ensure the guidelines are relevant and effective in addressing current health education challenges on food security. Build capacity of health education providers (56%) indicating slightly

more than half agree on the importance of building the capacity of health education providers. This suggests that enhancing the skills and resources of providers could significantly impact the quality of health education delivered on food security.

Involve community in planning, designing, and implementation (54%). Community involvement garnered significant support, highlighting the importance of local input and engagement in creating relevant and effective health education programs. This reflects a growing recognition of the value of participatory approaches. Review current health education strategies (40%) received moderate support indicating that while some believe there is room for improvement, others may feel existing strategies are adequate or have not been sufficiently evaluated.

Review the current model for delivering health education on food security (30%) received the least support, suggesting that there may be less urgency or consensus on the need to re-evaluate delivery models specifically for food security education. This could indicate either satisfaction with current models or a lack of awareness of their potential shortcomings. The analysis indicates a clear prioritization among respondents for increasing funding and building capacity in health education.

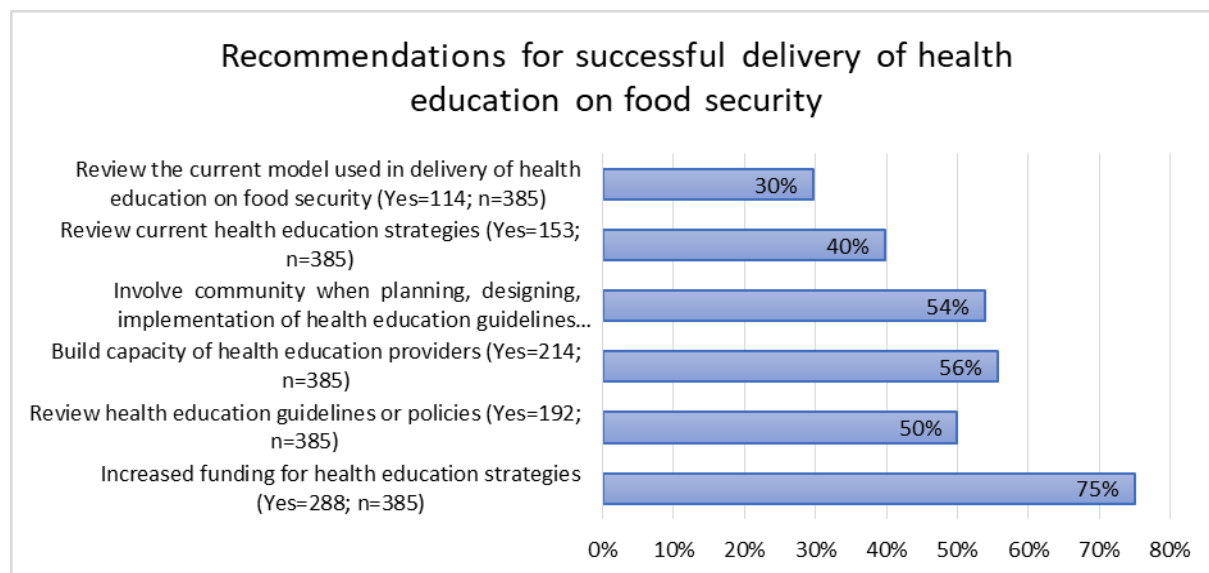


Figure 8 Suggested commended actions to be taken to address these barriers

4.4 Exploring Health education strategies that will enhance food security in Dadaab refugee camp, Kenya.

4.4.1 Integration of health education into food security messages

Results indicated a notable 30.5% of respondents reporting adopting food utilization practices frequently, while 9.4% did so very frequently. Conversely, 19.3% of participants very rarely and 20.6% rarely adopt these practices. The frequency of adoption for food accessibility shows a similar trend, with 23.7% of respondents frequently incorporating these messages and 8.5% very frequently. However, a larger segment, 29.9%, reported rarely adopting food accessibility strategies, and 16.5% did so very rarely.

In terms of food availability, 24.1% of respondents frequently adopted these messages, while only 6.0% did so very frequently. The higher rates of "rarely" (28.7%) and "very rarely" (21.7%) suggest that food availability remains a significant issue, limiting the ability to implement related strategies. The aspect of food stability shows the highest rate of non-adoption, with 36.3% of respondents rarely adopting these strategies and 20.9% very rarely. Only 20.1% frequently adopted food stability messages, and just 7.9% did so very frequently. This highlights a critical area where many individuals may feel less secure, further underscoring the challenges they face in achieving food stability. The figure below shows feedback on the most adopted health education messages on food security pillars.

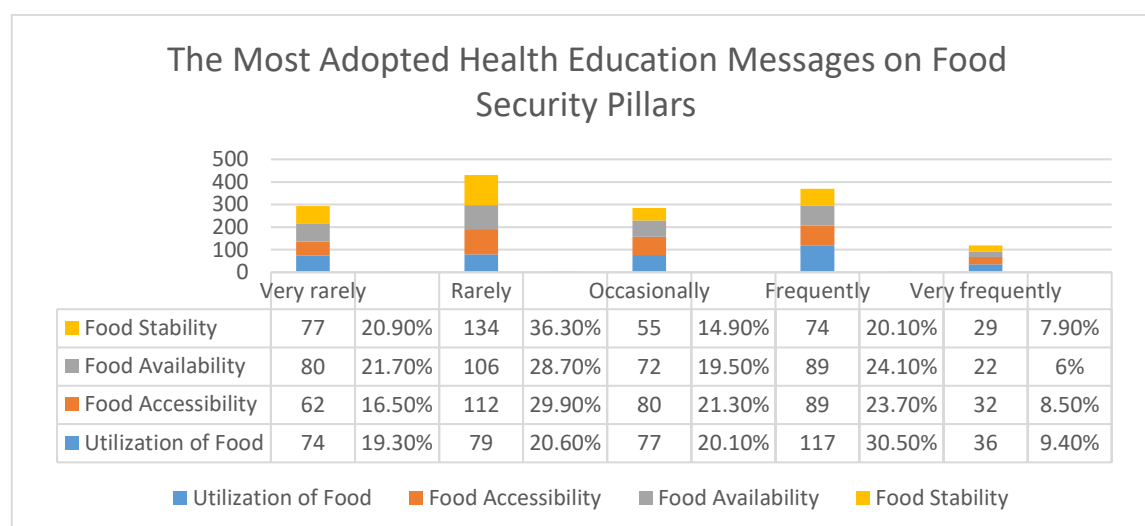


Figure 9 The Most Adopted Health Education Messages on Food Security Pillars

4.4.2 Effectiveness and Impact of Health Education on Food Security

The data presented in Table 11 provides a nuanced understanding of respondents' perceptions regarding the effectiveness and impact of health education on food security in the Dadaab refugee camp. A significant portion of respondents (31.1%) indicated that health education informs them "much" about food security, while 18.8% felt it informs them "a great deal." On the flip side, 12.0% reported that health education informs them "not much," and 15.4% said "little."

The data shows that 44.4% of respondents believe health education is "useful and actionable." However, the fact that 9.1% found it "not useful & actionable" and 8.8% echoed this sentiment raises concerns. The results show a positive trend, with 27.0% and 27.3% reporting being "much influenced" and "moderately influenced," respectively. Likewise, 14.0% felt "strongly influenced" yet 11.9% reported "not influenced" and 19.7% felt "little influenced".

Table 11 Perception of health education on food security

	Total N=385
How well do you believe health education best inform you about food security	
Not much	46 (12.0)
Little	59 (15.4)
Somewhat	87 (22.7)
Much	119 (31.1)
A great deal	72 (18.8)
To what extent do you find the health education on food security useful and actionable	
Not useful & actionable	35 (9.1)
Of little importance	61 (15.8)
Somewhat useful & actionable	84 (21.8)
Useful & actionable	171 (44.4)
Not useful & actionable	34 (8.8)
In your opinion, has health education positively influenced your awareness.	

and knowledge of food security

Not influenced	46 (11.9)
Little influenced	76 (19.7)
Moderately influenced	105 (27.3)
Much influenced	104 (27.0)
Strongly influenced	54 (14.0)

4.5 Nexus between participation in health education and food security

Multivariate analysis was conducted with an aim of formulating an ideal model for the data that can describe the existing dynamics of health education on food security. The regression model used for the analysis was defined as below:

The regression model used for the analysis was defined as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6$$

Where, β_i s are the coefficients; $i = 1, 2, 3$

The coefficients for the three study objectives are provided in the analysis shared in the Tables below:

4.5.1 Relationship between Understanding of health education on food security and awareness on health education strategies

Findings from a multivariable logistic regression conducted to examine the relationship between understanding of health education on food security and awareness of different health education strategies among participants in Dadaab are shown in Table 12. The model adjusted for key covariates including age, sex, education level, camp of residence, and household size. After adjusting for other variables, awareness of facility-based education was significantly associated with improved understanding (aOR = 2.95, 95% CI: 1.62–5.38, $p < 0.001$), as was awareness of technology-based education approaches (aOR = 3.06, 95% CI: 1.63–5.75, $p = 0.001$). In contrast, awareness of institutional-based strategies showed a positive but non-significant association (aOR = 1.20, 95% CI: 0.62–2.31, $p = 0.596$), while community-based strategies had a negative but also non-significant relationship (aOR = 0.68, 95% CI: 0.38–1.22, $p = 0.194$). These findings highlight

the critical role of accessible platforms, particularly health facilities and digital tools in promoting effective food security education among refugee populations.

Table 12 Relationship between Understanding of health education on food security and awareness of health education approaches

Number of observations = 376 | LR $\chi^2(4) = 70.26$ | Prob > $\chi^2 = 0.000$ | Log likelihood = -224.96206 | Pseudo $R^2 = 0.1351$

Understand21	Coef.	Std. Err.	Z	P> Z 	[95% Conf. Interval]	
Facility Based_ Aware	1.081703	0.3064889	3.53	0.000	0.4809957	1.68241
Institutional Based_ Aware	0.1783738	0.3361375	0.53	0.596	-0.480444	0.8371912
Community Based_ Aware	-0.387394	0.2984832	-1.30	0.194	-0.97241	0.1976223
Technology Based_ Aware	1.117291	0.321928	3.47	0.001	0.4863235	1.748258
_cons	-0.945901	0.1903091	-4.97	0.000	-1.3189	-0.5729018

4.5.2 Relationship between understanding of health education on food security and level of satisfaction, perception and standards for health education strategies used.

Further analysis using a multivariable logistic regression to assess how satisfaction, perception, and food system standards relate to understanding health education on food security among refugees in Dadaab was conducted and presented in Table 13. Participants who reported being satisfied with health education were significantly more likely to demonstrate understanding (aOR = 2.17, 95% CI: 1.16–4.04, $p = 0.015$). Perceiving health education as informative was positively associated with understanding, though this result was marginally significant (aOR = 1.67, 95% CI: 0.92–3.04, $p = 0.092$). Belief that food accessibility met acceptable standards also showed a strong positive association (aOR = 2.41, 95% CI: 1.24–4.68, $p = 0.009$). Conversely, participants who perceived food availability as adequate were significantly less likely to understand health education content (aOR = 0.46, 95% CI: 0.25–0.84, $p = 0.011$). No significant associations were

observed for food utilization ($p = 0.801$) and food stability ($p = 0.303$). These findings suggest that satisfaction with program quality and access to food are key drivers of effective health education, while misconceptions about food availability may hinder comprehension.

Table 13 Relationship between understanding of health education on food security and level of satisfaction, perception and standards for health education strategies used

Number of observations = 353 LR $\chi^2(4) = 60.21$ Prob > $\chi^2 = 0.000$ Log likelihood = -214.50612 Pseudo $R^2 = 0.1231$						
Understand21	Coef.	Std. Err.	Z	P> Z	[95% Conf. Interval]	
Level of satisfaction_ Satisfied	0.7735432	0.3176175	2.44	0.015	0.1510242	1.396062
Perception_ Informative	0.5146945	0.3053689	1.69	0.092	-0.083818	1.113207
Food Utilization_ Meet Standard	0.0863223	0.3429275	0.25	0.801	-0.585803	0.7584477
Food Accessibility_ Meet Standard	0.8807155	0.3380871	2.60	0.009	0.218077	1.543354
Food Availability_ Meet Standard	-0.781235	0.3071572	-2.54	0.011	-1.383252	-
						0.1792177
Food Stability_ Meet Standard	0.3408982	0.3311956	1.03	0.303	-0.308233	0.9900297
_cons	-1.019389	0.2115591	-4.82	0.000	-1.434038	-
						0.6047413

4.5.3 Relationship between understanding of health education on food security and key factors hindering the successful delivery of health education on food security.

A multivariable logistic regression presented in Table 14, accounting for various factors, identified governance-related barriers as the most significant obstacle to understanding health education on food security among refugees in Dadaab. These barriers were strongly associated with reduced understanding (aOR = 2.86, 95% CI: 1.59–5.15, $p < 0.001$), highlighting the negative impact of poor leadership and weak policy implementation on educational outcomes. Other factors, such as economic (aOR = 1.18, 95% CI: 0.65–2.15, $p = 0.590$), access (aOR = 1.16, 95% CI: 0.71–1.89, $p = 0.555$), social (aOR = 0.89, 95% CI: 0.56–1.39, $p = 0.597$), and cultural or religious barriers (aOR = 0.70, 95% CI: 0.41–1.20, $p = 0.193$), were found to be statistically insignificant. This underscores the central role of governance in shaping effective health education, with other barriers playing a less significant role in influencing participants' understanding.

Table 14 Relationship between understanding of health education on food security and key factors hindering the successful delivery of health education on food security

Number of observations = 385 LR $\chi^2(4) = 19.59$ Prob > $\chi^2 = 0.0015$ Log likelihood = -256.59961 Pseudo $R^2 = 0.0368$							
Understand21	Coef.	Std. Err.	Z	P> Z	[95% Conf. Interval]		
Economic Barriers- Yes	0.1647929	0.3060172	0.54	0.590	-0.4349897	0.7645755	
Social Barriers- Yes	-0.122012	0.2304579	-0.53	0.597	-0.573701	0.3296772	
Access Barriers- Yes	0.1472811	0.2492212	0.59	0.555	-0.3411834	0.6357457	
Governance- Yes	1.052168	0.2999638	3.51	0.0000	0.4642498	1.640086	
Culture& Religious Barriers- Yes	-0.353643	0.2719498	-1.30	0.193	-0.8866552	0.1793686	
_cons	-0.23045	0.3029838	-0.76	0.447	-0.8242877	0.3633869	

4.5.4 Relationship between understanding of health education on food security and demographics of participants

The logistic regression analysis conducted on the factors influencing refugees' understanding of food security revealed several significant findings. Given the logistic regression model below with findings presented in Table 15:

Logit (P(Understanding of Food Security))= β_0 + β_1 (Sex)+ β_2 (Long-staying Refugee)+ β_3 (Income Access)+ β_4 (Education Level)+ β_5 (Food Source)+ β_6 (Food Provider).

The model, with a chi-square value of 54.65 ($p < 0.000$), indicates a significant overall fit. Among the key variables, long-term refugee status was strongly negatively associated with understanding of food security (Coef. = -0.873, $p = 0.001$), suggesting that longer stays in the camp may limit awareness and engagement with food security education. Conversely, access to income was a significant positive predictor (Coef. = 1.472, $p < 0.001$), with those having income more likely to understand food security concepts. Food sources from other providers also showed a positive

relationship (Coef. = 0.619, $p = 0.041$), whereas reliance on institutional food aid was not significant. Notably, sex, education level, and food provider variables did not exhibit statistically significant effects. The model's pseudo R^2 of 0.1031 indicates that, while the predictors account for a notable portion of the variability, additional factors may influence food security education.

Table 15 Relationship between understanding of health education on food security and socio-demographics of participants

Number of observations = 383 LR $\chi^2(4) = 54.65$ Prob > $\chi^2 = 0.0000$ Log likelihood = -237.57577 Pseudo $R^2 = 0.1031$						
Understand21	Coef.	Std. Err.	Z	P> Z	[95% Conf. Interval]	
Sex_Male	0.0051291	0.250852	0.02	0.984	-	0.4967901
					0.4865318	
Category of respondents- Long staying refugee	-0.873255	0.2607584	-3.35	0.001	-1.384332	-0.362178
Income Access_ Yes	1.472488	0.2382361	6.18	0	1.005554	1.939422
Education Level- Some Education	0.4286577	0.2608331	1.64	0.1000	-	0.9398812
					0.0825658	
Food Source- Other sources	0.6193129	0.3033647	2.04	0.041	0.0247289	1.213897
Food Provider-Other providers	-0.4115162	0.4952442	-0.83	0.406	-1.382177	0.5591446
_cons	-0.1367649	0.2228803	-0.61	0.539	-	0.3000726
					0.5736023	

CHAPTER FIVE: DISCUSSION, SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

In this chapter, provides discussions for the key findings and summarize these findings from the study on the dynamics of health education on food security in the Dadaab refugee camp. This research aimed to explore the various strategies employed in health education, assess the levels of awareness and satisfaction among participants, and evaluate the key factors hindering the successful implementation of health education on food security within the camp.

The findings revealed a complex interplay between awareness, satisfaction, and the effectiveness of health education strategies on food security. Despite relatively high levels of awareness among certain groups, significant gaps persisted, particularly among newly arrived refugees. Additionally, while some respondents expressed satisfaction with the current health education initiatives, many indicated a need for improvement, particularly regarding the informativeness and accessibility of the programs.

In conclusion, this chapter will synthesize these findings, emphasizing the critical areas that require attention to enhance the effectiveness of health education on food security in Dadaab. It will also outline specific recommendations aimed at stakeholders including NGOs, health providers, and policymakers—to foster a more resilient and informed community, ultimately improving food security outcomes for the refugee population. By addressing the identified challenges and leveraging the strengths of existing initiatives, it is possible to create a more sustainable approach to health education on food security in the camp.

5.2 Discussion

5.2.1 Socio-demographic information

The socio-demographic profile of respondents in the Dadaab refugee camps paints a picture of a highly vulnerable population shaped by displacement dynamics, economic hardship, and limited educational opportunities. A notable gender imbalance was observed, with women constituting 69.9% of the study population. This disparity aligns with broader displacement patterns in protracted refugee settings, where women often remain in camps while men face higher mobility or conflict-related risks (UNHCR, 2023a). Their predominance underscores the importance of

designing gender-sensitive health education programs, particularly those that address reproductive health, child nutrition, and caregiving roles traditionally assumed by women.

Furthermore, 70.4% of respondents had lived in the camps for five years or longer, reflecting a relatively stable and long-settled refugee population. Prolonged residency may enhance adaptation to the camp environment, improve knowledge of available services, and influence patterns of health-seeking behaviour and food resource utilization (UNHCR, 2023a). This long-term exposure also correlates with better awareness of health education initiatives, suggesting that sustained contact with such programs is associated with improved health and food security practices.

The age distribution reveals a predominantly youthful to middle-aged demographic, with only 4.7% aged 60 years or older. This skewed distribution necessitates health education strategies that are responsive to the reproductive, nutritional, and economic needs of a working-age population (Sossou et al., 2010; WHO, 2008). Young adults in refugee camps are particularly vulnerable to poor sexual and reproductive health outcomes due to disrupted healthcare systems and limited access to information and services (Sossou et al., 2010). These vulnerabilities are compounded by widespread unemployment often linked to restrictions on movement and the lack of formal labour markets which inhibits economic autonomy and deepens food insecurity (World Bank, 2023).

Economic vulnerability emerged as a prominent concern in this study, with 55.6% of participants reporting no access to any form of income. This financial precarity severely constrains dietary choices, limits the ability to participate in health and nutrition programs, and reinforces aid dependency. The importance of economic empowerment in food security and health education outcomes is supported by studies advocating for integrated approaches that combine educational initiatives with cash transfers or livelihood support to reduce dependency and promote resilience (Hejazi et al., 2023; Shapu et al., 2022).

The findings also revealed that 79.4% of respondents were married, highlighting the need to design household-level interventions. Spousal dynamics significantly influence food allocation decisions and health-seeking behaviours. Therefore, involving both partners in health education initiatives could foster shared responsibility and more effective implementation of nutrition and food security practices (UNHCR, 2023b; World Bank, 2023).

Perhaps the most alarming statistic relates to educational attainment: 72.4% of participants had no formal education. This limited educational background presents a substantial barrier to engaging with health education and implementing food security strategies (Shahid et al., 2022). Disruptions in schooling due to conflict and forced displacement, compounded by systemic barriers in host country education systems, have led to low levels of literacy and health literacy among refugees (Piper et al., 2020). As a result, it is imperative to adopt accessible educational methodologies including visual aids, simplified language, and experiential learning to ensure inclusive health education delivery. Agrawal et al. (2024) emphasize the importance of training in sustainable agriculture and food preservation, which can empower refugees with practical knowledge to enhance food availability and dietary diversity.

The study also confirmed an overwhelming reliance on food aid, with 78.4% of households depending primarily on World Food Programme (WFP) rations. This heavy dependence reflects structural constraints such as restricted mobility, lack of land, and limited market access, all of which hinder self-reliance (Aubery & Buisson, 2024). However, some evidence of a gradual shift toward self-sufficiency particularly among those with longer stays and access to alternative food sources suggests that appropriately targeted interventions can catalyse sustainable behavioural change.

Notably, the study also explored the extent to which refugees received health education across the four pillars of food security: availability, accessibility, utilization, and stability. While food utilization showed relatively higher engagement, 28.5% reported frequent education, significant gaps were identified in the other pillars. Education on accessibility was notably lacking, with 33.4% reporting rare exposure, and education on stability was the least covered, with a combined 55.7% indicating rare or very rare engagement. These findings are consistent with broader humanitarian trends, such as those observed among Rohingya refugees, where reliance on aid has increased alongside growing food insecurity (IRC, 2024).

Further analysis suggests that refugees with access to income-generating opportunities and alternative food sources such as market purchases or self-production demonstrated a better understanding of food security concepts (Anwar et al., 2024; Nisbet et al., 2023). This highlights the role of economic agency and livelihood diversification in improving both food security outcomes and the effectiveness of health education interventions.

In conclusion, the socio-demographic characteristics of the Dadaab refugee population, including gender imbalance, low educational attainment, prolonged displacement, and economic fragility, highlight the urgency for health education programs that are not only context-sensitive but also inclusive and sustainable. Targeted, accessible educational strategies that account for these realities can play a pivotal role in promoting long-term food security and resilience in refugee settings (World Bank, 2020; 2021).

5.2.2 Health Education Strategies on Food Security in The Dadaab Refugee Camp.

Health education plays a pivotal role in addressing food insecurity among refugee populations, especially in protracted displacement settings such as the Dadaab Refugee Camp. An assessment of health educational strategies implemented within the camp reveals an uneven landscape of awareness and effectiveness across different modalities; facility-based, institution-based, community-driven, and technology-enabled approaches.

Survey data show that community-based health education strategies, including house-to-house visits and small group dialogues, enjoy the highest levels of awareness and engagement. Approximately 40.9% of respondents reported being “very aware” of these community outreach efforts. In contrast, only 27.9% reported being “very aware” of facility-based strategies, and an even smaller fraction (10.7%) were “extremely aware” of institution-based approaches such as school-integrated programming. A significant proportion of the population of up to 24.3% was “not at all aware” of technology-based interventions, reflecting either limited access to digital tools or a general lack of digital literacy. These gaps are particularly prominent among newly arrived refugees, who accounted for approximately 29.6% of study participants. Their limited exposure to the camp’s existing educational infrastructure appears to hinder early understanding and access to food security resources. These findings underscore the necessity for enhanced communication and outreach efforts to raise awareness about the services offered by health providers and NGOs.

Interestingly, this demographic may present an opportunity rather than a limitation. New arrivals often demonstrate openness to innovative and adaptive strategies, in contrast to long-term residents who may be more accustomed to and possibly reliant on traditional education methods. This duality creates an imperative to tailor programming to both populations: leveraging innovation for new arrivals while maintaining relevance and continuity for those with longer tenure in the camp. This group may indeed have limited exposure to existing health education strategies, contributing

to the awareness gaps noted above. Their unfamiliarity with the camp's resources may impede their understanding of health education efforts. This could create an opportunity to implement fresh strategies that resonate with newcomers while considering the preferences and experiences of longer-term residents. Key informant excerpts below provided suggestions for consideration:

"Quality in delivery of health education on food security must be synthesized and customized to the Dadaab context. Elements of health education are not adequately embedded in extension messages". (Key informant interview, WFP Dadaab Head of Programme/ Deputy head of Area office East)

"The application of artificial intelligence can enhance the delivery of health education, but concerns about decreased employment must be addressed." (key informant interview, UNHCR Dadaab Head of Operations)

The findings highlight a dual concern: although many refugees are somewhat familiar with health education efforts in the camp, considerable knowledge gaps persist, particularly among newly arrived individuals. These awareness deficits can undermine food security initiatives, as effective health education relies heavily on community engagement and understanding. Efforts should prioritize increasing awareness among those who indicated they are "not at all aware," especially by using communication strategies tailored to the specific needs of new arrivals. Orientation sessions could be introduced to help newcomers understand available health education resources and programs, promoting inclusivity from the outset. For long-term residents, involving them in the development of health education strategies can enhance acceptance and foster a sense of ownership.

Community engagement has proven effective in disseminating health education. For instance, the Women for Education Health Development (WOHED) organization has trained local women to identify and support tuberculosis (TB) patients, bridging the gap between patients and healthcare facilities. These community health workers provide education on maintaining a healthy diet and encourage individuals to access healthcare services, significantly improving health outcomes within the refugee community (Women for Education Health Development, 2024).

Despite the relative success of such community-based approaches, feedback on existing health education strategies was mixed. Only 30.1% of respondents rated the current strategies as

moderately effective, while 36.4% found them minimally helpful or ineffective. Additionally, the frequency of exposure to education on key pillars of food security; utilization, accessibility, availability, and stability, varied markedly. While 38.7% of participants reported frequent exposure to information on food utilization, a significant 42.5% had rare or very rare exposure. Education on food accessibility was particularly sparse, with only 6.7% of respondents frequently exposed to such content. This aligns with findings from a scoping review of 57 refugee food security programs, which showed that most interventions emphasize cash/voucher assistance and agricultural training, while few address knowledge gaps around access barriers or utilization practices (Nisbet et al., 2022).

Furthermore, satisfaction levels with food security outcomes remain low. Only 34.7% of participants believed food utilization met acceptable standards; 45.8% reported that it fell short. Similar trends were observed in food access (48.7% rated it inadequate), availability (52.6% subpar), and stability (56% reported unstable supply). These systemic challenges reinforce the need for more holistic, contextually responsive health education strategies that not only disseminate information but also equip refugees with practical tools to navigate and improve food systems.

Different delivery modalities yielded varied preferences. Facility-based education led by healthcare workers and NGOs were favoured by 35.1% of participants, with an additional 9.6% listing it as their most preferred method. However, a substantial segment expressed disinterest, suggesting a mismatch between the approach and user needs. Institution-based strategies also received mixed responses, with moderate support offset by perceived lack of relatability or accessibility. Conversely, community-based methods were the most consistently well-received, underscoring the importance of interpersonal engagement and trust in educational delivery.

Technology-driven strategies, while promising in theory, have yet to realize their full potential in Dadaab. Awareness and engagement remain low due to infrastructural barriers and digital illiteracy. A case study by Burkardt, Krause, and Rivas Velarde (2019) on blended learning for junior health workers in Dadaab highlighted the promise of mobile learning apps in improving competencies. Yet, connectivity issues and limited training opportunities persist as barriers to scalability. Careful implementation of digital strategies, supplemented by on-the-ground support, will be key to ensuring inclusivity.

The findings reveal significant gaps in the adoption of food security practices among the study participants, particularly in food utilization and accessibility strategies. While 30.5% of respondents frequently applied food utilization practices, a notable 40% rarely or never did. Food accessibility strategies were similarly underutilized, with 29.9% rarely adopting these approaches, and 16.5% reporting very rare adoption. These trends highlight the need for targeted interventions that address the barriers preventing the effective application of food security messages (Aubery & Buisson, 2024). Additionally, a heavy reliance on food rations, reported by 78.4% of respondents, creates a fragile dependency system that is vulnerable to spoilage, theft, and delays in distribution. The uncertainty around long-term residency discourages refugees from investing in more sustainable food practices, such as small-scale agriculture, which could offer long-term solutions to food insecurity.

In terms of health education, nearly 50% of respondents felt that it had significantly enhanced their understanding of food security, while 27.3% found it moderately influential. However, a substantial portion (31.6%) felt little to no impact, suggesting that the current educational formats may not fully engage all demographic groups. While 44.4% described the health education as "useful and actionable," 17.9% disagreed, indicating the need for more localized, culturally appropriate, and practical content that resonates with the diverse refugee population. Addressing cultural, linguistic, and logistical barriers is crucial to improving the effectiveness and reach of food security education programs (Aubery & Buisson, 2024). Applying systems theory, this study recognized the interdependence between health education, governance, social norms, and external shocks in shaping food security outcomes. For instance, one informant explained:

“Health education on food security is not well developed in Kenya... Training on health implications of chemical use and standardizing curriculum across the food value chain is key.”

(Key Informant Interview, WFP Representative)

Another stakeholder emphasized the opportunity presented by new infrastructure:

“The construction of a level 4 hospital in Dadaab offers an opportunity for enhancing health education... Previous approaches have been temporal and need to adapt to current realities.”

(Key Informant Interview, UNHCR Representative)

This systems perspective stressed the importance of integrated and adaptive interventions that reflect the evolving nature of the refugee population, institutional frameworks, and the socio-economic environment.

Health facilities within the camp do offer structured education sessions, but awareness remains uneven. Only 32.1% of participants reported consistent access to health education, while 43.8% accessed it irregularly. Despite this inconsistency, the demand for more frequent and reliable education remains high: 46.2% of respondents requested continuous sessions, and 27.7% expressed a desire for increased frequency.

The findings point to a complex interplay between awareness, accessibility, and relevance of health education in shaping food security outcomes. Long-term residents appear more informed, likely due to sustained engagement with nutrition programs, peer-to-peer learning, and familiarity with the camp's resources (UNHCR, 2005). Their knowledge base also correlates with greater food security, as confirmed by comparative studies in other refugee settings. For instance, Hoque and Yunus (2020) observed that earlier-arriving Rohingya refugees were more likely to supplement food aid with self-generated income and demonstrated higher food security. Anwar et al. (2024) similarly reported that households with income beyond aid exhibited better food security outcomes than those dependent solely on rations.

Ultimately, improving food security in Dadaab requires a multi-pronged health education strategy that addresses the full spectrum of refugee experiences. Community-driven, contextually sensitive approaches should remain central, while institutional, facility-based, and digital methods must be refined to enhance relevance, accessibility, and trust. Programs should aim to balance innovation with inclusion, aligning delivery formats to the preferences of different population segments. Moreover, consistent evaluations and feedback mechanisms are essential to track impact, adapt to changing needs, and ensure that no segment of the refugee population is left behind.

5.2.3 Nexus Between Participation in Health Education and Food Security in the Dadaab Refugee Camp

52.5% of the respondents understand what health education on food security means, indicating a substantial gap in comprehension that could hinder effective engagement with health education initiatives. This split suggests the need for foundational education efforts that clarify the concepts

and importance of food security and health education. Targeted interventions could focus on increasing awareness among those who currently lack understanding.

Among those who do understand health education, 63.7% are aware of organizations providing it. This indicates a relatively good level of awareness regarding service providers, which is essential for participants to access available resources. Nonetheless, 36.3% of respondents are not aware of the organizations, suggesting a gap in communication and outreach that should be addressed. Increasing visibility of these organizations could help bridge this awareness gap and enhance engagement.

The responses about how often participants receive health education on food security show a diverse picture: A combined total of 43.8% of respondents receive health education infrequently, which is concerning and highlights the need for more consistent educational outreach. While 24.2% indicates some regularity, it still points to a need for increased frequency. Only 32.1% of respondents receive education on a more consistent basis, underscoring that many may not have enough exposure to health education on food security.

The desire for increased frequency of health education is clear, with 46.2% of participants expressing a wish to receive it "always" and 27.7% wanting it "often." This strong demand indicates that there is an appetite for more educational opportunities, suggesting that existing programs may not be meeting the community's needs. This feedback provides critical insights for program developers to consider. Increasing the frequency of health education sessions, as well as exploring different formats (e.g., workshops, group discussions, or digital platforms), could enhance engagement and effectiveness. This is confirmed from assorted feedback from focus group discussions that were conducted in the camp listed below:

“Health professionals should conduct sessions or provide posters and pamphlets in waiting areas about nutrition, food choices and food security measures. Hospitals should integrate education into patient care specifically for those with chronic conditions. Curriculum should include nutrition education, gardening programs and school meal planning that emphasize on food security principles. Employees wellness programs should offer workshops on health eating, cooking demonstrations and resources on local food security initiatives. Engaging congregations in discussions and activities around food security and nutrition by religious leaders while

integrating these teachings with the religious teachings is key. Hosting workshops and gardening clubs that promote sustainable food practices and food security awareness is also significant. Sharing tips, recipes and local initiatives related to food security and nutrition on social media platforms. There is a need to provide access to information on nutrition, meal planning and local food resources on websites and mobile applications.”

(Recommendations from Focus Group Discussions in Dadaab)

Food accessibility encompasses both physical and economic access to food. Most key informants echo that training in financial literacy and resource management can improve refugees' ability to prioritize food expenditures, thereby enhancing their economic access to food. Teaching refugees about dietary diversity, nutrition, and food preparation methods that maximize nutrient retention was thought to reduce malnutrition rates. Understanding the importance of micronutrients and food hygiene was noted to significantly impact health outcomes, making food utilization a critical area for health education.

Health education was thought to contribute to food stability by promoting resilience strategies that enable refugees to cope with food shocks, such as changes in food aid or market fluctuations. Knowledge of coping mechanisms, such as diversifying food sources and establishing community food banks, can enhance food stability in refugee settings. Health education can also foster a sense of community and collective responsibility, reinforcing social support systems during crises.

The analysis of Table 14 reveals a complex relationship in respondents' ability to understand health education on food security. The coefficient on whether respondents are aware of health education delivery approaches at facility level was 1.081703 and statistically significant at the 5% confidence level, indicating that higher awareness of delivering health education on food security at the facility level increases the likelihood of understanding the subject. Similarly, the coefficient of 1.117291 for awareness on use of technology in health education delivery is also statistically significant at the 5% level. This suggests that awareness of technology-based health education approaches also significantly increases the likelihood of understanding food security. The use of technology in health education likely enhances its reach and effectiveness, fostering a better understanding among individuals. The coefficient for awareness of health education approaches at the institutional level is positive but not statistically significant at the 5% confidence level. This means that although there is a positive relationship between awareness of health education at the

institutional level and understanding food security, this relationship is not strong enough to be considered statistically reliable at the conventional 5% significance level. This may suggest that awareness at the institutional level does not have as immediate or impactful an effect on understanding food security compared to awareness at the facility or technology-driven levels. The findings underscore the importance of context-specific and accessible approaches (like facility-level or technology-driven education) in enhancing public understanding of critical issues such as food security.

The results presented in Table 15 provide important insights into various factors related to food security and their statistical significance. The positive coefficient for the level of satisfaction with health education suggests that individuals who are more satisfied with health education on food security are more likely to report a better understanding or perception of food security. The statistical significance at the 5% level confirms that this relationship is robust and not due to random chance. This highlights the importance of ensuring high-quality, engaging, and relevant health education to improve perceptions and awareness of food security issues.

A positive and statistically significant coefficient indicates that the perception of health education being informative positively influences the understanding of food security. When individuals perceive health education to be informative, they are more likely to gain relevant knowledge about food security. This suggests that the content and clarity of the health education provided are crucial factors in shaping individuals' awareness and understanding of food security issues.

The positive and statistically significant coefficient for food accessibility suggests that when people perceive food accessibility to meet certain standards, they are more likely to have a favourable view of food security. This emphasizes that ensuring individuals have access to food that meets certain standards is a critical aspect of food security and directly impacts people's perception of their food security status.

This result is somewhat unexpected, as a negative coefficient suggests that when food availability is perceived as meeting standards, it may be associated with a reduced likelihood of favourable perceptions of food security. This could imply that other factors, such as quality, variety, or distribution issues, may be at play. It might also suggest that availability alone does not guarantee food security if other aspects of food security (such as accessibility or affordability) are not

sufficiently addressed. The negative but statistically significant result invites further investigation into the nuances of food availability in relation to overall food security.

The positive coefficient implies that when individuals perceive food stability (i.e., the consistent availability of food over time) as meeting standards, they are likely to have a positive view of food security. However, the lack of statistical significance at the 5% level indicates that this relationship may not be strong enough to be considered reliably meaningful within the sample. This may indicate that food stability is less influential in shaping individuals' perceptions of food security compared to other factors, such as food accessibility or the perceived informativeness of health education.

A positive coefficient suggests that when individuals perceive food utilization (i.e., the proper use and consumption of food) as meeting standards, they are more likely to have a favourable view of food security. However, since the relationship is not statistically significant, this factor may not play as crucial a role in shaping individuals' perceptions of food security as other factors in the model. This could suggest that, while food utilization is important, other elements of food security (such as food accessibility or the perception of health education) may have a stronger impact on overall food security perceptions.

The results revealed the importance of health education and food accessibility in shaping perceptions of food security. While factors like food stability and food utilization are relevant, their impact may be less immediate or significant in shaping individuals' views on food security within this context. The negative coefficient for food availability suggests that simply ensuring food is available is not enough to guarantee food security—other aspects, such as the quality and distribution of food, must also be considered.

5.2.4 Exploring Health education strategies that will enhance food security in Dadaab refugee camp, Kenya.

Food security is traditionally framed through four main pillars: availability, accessibility, utilization, and stability. According to the Food and Agriculture Organization (FAO, 2022), these pillars collectively define food security, emphasizing the need for sufficient food supply, physical and economic access, proper nutritional use, and resilience against shocks. In refugee camps,

where food insecurity is prevalent, understanding how health education intersects with these pillars is crucial for developing effective interventions.

Findings from the study reported a notable 30.5% of respondents adopting food utilization practices frequently, while 9.4% did so very frequently. This indicates a relatively strong engagement with food utilization messages. Conversely, 19.3% of participants very rarely and 20.6% rarely adopt these practices. This suggests that while many have embraced food utilization strategies, there remains a significant portion of the population that has not fully integrated these messages into their daily routines. However, a larger segment, 29.9%, reported rarely adopting food accessibility strategies, and 16.5% did so very rarely. This indicates that many individuals still face challenges in accessing food, impacting their ability to apply these messages effectively.

This analysis indicates a complex picture of how food security messages are adopted within the Dadaab refugee camp. While there are encouraging signs of frequent engagement with food utilization strategies, significant barriers remain in food accessibility, availability, and stability. The varying levels of adoption suggest a need for targeted interventions that address the specific challenges individuals face. For instance, enhancing food accessibility and stability could be prioritized to improve overall food security. There may also be a need for improved communication and education efforts that resonate with the community's experiences and challenges, ensuring that all aspects of food security are adequately addressed.

By understanding these adoption patterns, stakeholders can better design health education initiatives that promote effective food security strategies and ultimately enhance the well-being of the refugee population. These findings align with other studies highlighting the precarious nature of life in refugee camps, particularly regarding food security and investment in sustainable livelihoods. As noted by (Aubery & Buisson, 2024), the uncertainty surrounding the duration of a refugee's stay can discourage meaningful investments in small businesses or agricultural assets. This instability exacerbates the challenges faced by refugees, as they may be hesitant to allocate resources to initiatives that could be rendered unviable if their circumstances change.

The reliance on food rations, reported by 78.4% of respondents, further complicates this issue. Given that much of this aid is provided in kind and consists of perishable items, the risk of spoilage,

theft, or loss due to environmental factors such as flooding looms large. Such vulnerabilities can undermine food security, forcing refugees to rely more heavily on external assistance while limiting their capacity to engage in activities that could foster self-sufficiency.

This cycle of dependency not only affects immediate food availability but also impacts longer-term strategies for stability and resilience within the camp. To address these issues, targeted interventions are needed that enhance food security while considering the unique challenges refugees face. This may involve diversifying food sources, improving storage facilities, or creating economic opportunities that enable individuals to invest in sustainable livelihoods, even in the face of uncertainty.

The data to understand respondents' perceptions regarding the effectiveness and impact of health education on food security in the Dadaab refugee camp shows a significant portion of respondents (31.1%) indicating that health education informs them "much" about food security, while 18.8% felt it informs them "a great deal." This suggests that many participants find value in the information provided, indicating that health education efforts are, to some extent, effective. On the flip side, 12.0% reported that health education informs them "not much," and 15.4% said "little." These responses point to a significant minority who may feel disconnected from the educational content, highlighting a potential need for more engaging or relevant delivery methods.

The data shows that 44.4% of respondents believe the health education is "useful and actionable." This indicates a strong recognition of the practical application of the information they receive, suggesting that many find the content relevant to their daily lives. However, the fact that 9.1% found it "not useful & actionable" and 8.8% echoed this sentiment raises concerns. This underlines the need to ensure that all educational materials are not only informative but also practical and relatable to the participants' circumstances.

The results show a positive trend, with 27.0% and 27.3% reporting being "much influenced" and "moderately influenced," respectively. The 14.0% who felt "strongly influenced" indicates that for a considerable segment of the population, health education is significantly enhancing their understanding of food security. Yet, the 11.9% who reported "not influenced" and 19.7% who felt "little influenced" suggest that there are still individuals who are not benefiting from these

initiatives. This could be due to various factors, including accessibility issues, cultural barriers, or the format of the education being less engaging.

The findings indicate a generally positive perception of health education related to food security, with a solid foundation of awareness and perceived utility. However, the presence of a minority who feel unengaged or unaffected suggests critical areas for improvement. To better reach those who are less influenced, it may be necessary to develop tailored approaches that consider the unique circumstances and preferences of various demographic groups within the camp. Establishing feedback channels could provide invaluable insights into the barriers faced by those who feel disengaged. Understanding their specific challenges can help refine educational strategies, ensuring that the content is not only informative but also resonates with the lived experiences of all participants.

In Dadaab, health education, food security, and the refugee population are part of a larger system that includes the Kenyan government, humanitarian organizations, local governance, cultural practices, and socio-economic factors. Systems theory applied in this study offers a comprehensive framework that posits that changes in one component can significantly affect others. For instance, inadequate provision of health education on food security may lead to poor dietary choices among refugees, positively impacting their nutritional status and overall well-being. Excerpts from key informant interviews conducted among key decision makers within Dadaab camp emphasizes the need for interconnections among various components that influence both health education delivery and food security outcomes as below:

"Health education on food security is not well developed in Kenya except for large production industries. Embedding health education in production on the safe use of chemicals is necessary, alongside training farmers on health implications. Consideration of alternative organic approaches is needed, particularly in managing carcinogenic herbicides. Food safety standards must be adhered to prevent harmful microbial development and control aflatoxin. Emphasizing a standardized curriculum that guides all stakeholders in the food value chain is key." (Key Informant Interview with WFP Dadaab Head of Programme).

Systems theory recognizes that systems are dynamic and constantly evolving. In Dadaab, the refugee population is not static; new arrivals bring different experiences and knowledge, which can influence health education strategies. Understanding these dynamics allows for the adaptation of health education to be more relevant and effective, catering to both long-term residents and newcomers. A systems approach encourages a holistic view of food security, encompassing not just food availability but also accessibility, utilization, and stability. In Dadaab, health education should address all these dimensions. For instance, while educating refugees on food security is crucial, it must be complemented by efforts to improve health outcomes through collaboration with humanitarian organizations. This is backed by the below excerpt from a key informant interview:

"The construction of a level 4 hospital in Dadaab offers an opportunity for enhancing health education on food security. Aligning health service provision with national systems is crucial. Look at the attitude and cultural perspectives of beneficiaries, such as misconceptions about meat consumption and camel milk. Education should consider transformative aspects and sustainability. Focus should shift from merely feeding children to ensuring they are fed well. Program delivery is intertwined with cultural aspects, requiring ethical considerations. Dadaab's previous approaches to health education have been temporal and need to adapt to current realities. There is a need for professionals to educate on healthy eating and climate mitigation."

(Assorted excerpts from Key Informant Interview with UNHCR Dadaab Head of Operation).

The data on knowledge on food security in Dadaab highlights several critical areas where knowledge and access to resources concerning food security are lacking in Dadaab. The primary challenges include limited access to production resources, knowledge of nutrition-sensitive practices, and economic barriers related to market access. Enhancing education and resource availability in these areas, along with promoting equitable decision-making and gender dynamics, could significantly improve food security outcomes. Future efforts as suggested in the focus group discussions and key Informant Interviews excerpts are listed below:

"Regular sessions led by nutritionists should be organized. Support groups for mentorship can enhance community knowledge. Frequent workshops and creating networking groups are

recommended. Desire for guidance on accessing nutritious food and understanding local food resources. Emphasis on learning to identify and utilize locally available produce. Integrate nutrition education and gardening programs into the curriculum.”

(Focus Group Discussion in Dagahaley camp).

“Allocate funds to support health education programs. Secure funding for capacity-building workshops.”

(Focus Group Discussion, Adult women, and youths separately, Ifo 2 camp)

“Quality is still wanting, and accessibility for people with disabilities is a challenge. There is a significant gap in health education on food security.”

(Key Informant Interview, Kenya Red Cross Society, Dadaab Health and Nutrition Manager)

“We are beginning to understand that food security involves not just availability but also access to safe and nutritious food. The challenges we face are poor infrastructure, gender roles, and low literacy that impede understanding of food security. We need to understand how to access food and the effects of economic crises. Sometimes language barriers and a lack of respect for our ideas hinder engagement. Clear communication and community involvement are crucial for successful programs. A sense of ownership and active participation in planning processes is necessary especially by the youths.”

(Assorted Focus Group Discussions across the camps).

From the results, a comprehensive programme cycle for health education on food security in Dadaab is structured into several key phases. The first phase being the needs assessment which should entail identifying the specific health education needs related to food security among the refugee population through focus group discussions, analysis of existing data and engagement with stakeholders. Secondly, designing or developing a tailored health education programme based on the findings from the needs assessment such as curriculum and educational materials that are relevant to current transitions and accessible to the target population and identify appropriate

delivery methods (e.g., workshops, community meetings, mobile apps) based on the preferences of the refugees.

Thirdly, executing the health education programme effectively by training facilitators, launching the programme through community outreach events, distribute educational materials and resources, ensuring they are available in languages understood by the community and utilize various delivery methods, including face-to-face sessions, group discussions, and technology-driven platforms. Fourthly, assess the effectiveness and impact of the programme by developing monitoring tools such as surveys and feedback forms to collect data on participants' knowledge, satisfaction, and behavior changes, conduct regular assessments to evaluate the reach and impact of the programme on food security knowledge and practices and gather feedback from participants to identify areas for improvement and success stories.

Fifth, continuously refine the programme based on monitoring and evaluation findings, identify trends and gaps in knowledge or practice, adjust the programme content, delivery methods, and outreach strategies based on participant feedback and evaluation results and engage stakeholders in discussions to incorporate their insights for programme enhancement. Sixth is ensure the long-term viability of the health education programme while exploring funding opportunities and partnerships to support health education initiatives, training local community members to take on leadership roles in continuing education efforts and create a network of support among refugees, NGOs, and local organizations to foster a collaborative approach to food security education. Lastly, share findings and advocate for the importance of health education on food security with stakeholders, including policymakers, to advocate for continued support for health education in refugee settings while engage in community advocacy to promote the importance of food security and health education among refugees and host communities.

The regression analysis revealed a statistically significant and positive coefficient for governance ($p < 0.05$), confirming that poor governance negatively impacts health education initiatives and food security outcomes. This finding aligns with previous research that emphasizes the importance of strong governance structures in the successful implementation of health and food security programs, with challenges in governance often exacerbating resource allocation issues and impeding program effectiveness (UNHCR, 2022; World Bank, 2020). Focus group discussions

across Dadaab camps outlined concrete strategies such as regular nutritionist-led sessions and mentorship groups, inclusion of gardening in school curricula, funding for workshops and capacity-building, ensuring accessibility for persons with disabilities and prioritizing community involvement and feedback mechanisms.

“Clear communication and community involvement are crucial... A sense of ownership and active participation in planning is necessary.” (Focus Group, Youth Participants, Ifo 2 Camp)

Governance plays a central role in shaping the policy and regulatory environment that impacts the design, implementation, and scaling of health education initiatives. If governance is poor due to lack of political will, corruption, or inadequate policies, it can lead to weak or fragmented efforts in delivering health education on food security. Effective governance ensures that resources such as funding, human resources and infrastructure are allocated appropriately to health education programs. Without proper oversight and coordination, health education initiatives may not reach all the intended audiences or may be less effective in improving understanding of food security. Addressing governance-related challenges could therefore be a key strategy for improving the reach and effectiveness of health education on food security.

While there are indications of positive involvement in health education initiatives, gaps in education, infrastructure, and governance continue to impede progress. Adopting a systems-thinking approach, which acknowledges the interconnectedness of socio-economic factors, institutional structures, and educational methods, is essential for developing effective solutions to food insecurity in refugee contexts. Health education strategies need to be tailored, inclusive, and multifaceted, reflecting the lived experiences of refugees to enhance their resilience and self-sufficiency. Strengthening governance, improving communication, and actively involving refugees in the design of programs are critical steps toward improving food security and long-term sustainability in refugee settings (Aubery & Buisson, 2024; UNHCR, 2023).

5.3 Summary of findings

5.3.1 Awareness of Health Education Strategies

Awareness of different health education strategies varied among participants. For facility-based approaches, 27.9% reported being "very aware" and 9.7% "extremely aware," while 24.0% were

"not at all aware." A similar pattern was observed for institution-based strategies, with 27.9% "very aware," 10.7% "extremely aware," and 23.8% unaware. These results highlight a need for improved communication and promotion of health services across institutions.

Community-based strategies recorded the highest awareness levels, with 29.1% of participants "very aware" and 11.8% "extremely aware," while 22.6% were unaware. These strategies appear to be more effectively received. On the other hand, technology-based approaches had lower awareness, with 26.1% "very aware" and 9.5% "extremely aware," and 24.3% reporting no awareness at all. This may reflect barriers such as limited access to technology or low digital literacy.

5.3.2 Demographic Influences and Awareness

Newly arrived refugees (29.6% of respondents) were found to be less familiar with existing health education strategies. While this unfamiliarity may hinder initial engagement, it presents a unique opportunity to introduce tailored, innovative approaches. Conversely, long-serving refugees demonstrated better understanding of food security, as indicated by a positive coefficient in Table 13, suggesting that longer exposure enhances access to education and support systems.

Access to income was positively associated with a better understanding of food security. Income facilitates access to better nutrition, health services, and education, which can enhance health knowledge. Similarly, individuals who rely on self-production or market purchases rather than food aid showed greater awareness of food security, possibly due to increased self-reliance and exposure to food-related decision-making.

5.3.3 Understanding and Frequency of Health Education

While 52.5% of respondents understood what health education on food security entails, a notable 47.5% did not. Among those who understood the concept, 63.7% were aware of the organizations providing this education. However, 36.3% lacked this knowledge, signaling a communication gap.

Only 32.1% of participants consistently received health education. Food utilization emerged as the most delivered topic (28.5%), followed by food accessibility (22.6%), food availability (21.5%),

and food stability (14.9%). While this shows an emphasis on helping refugees make the best use of available food, over half of the respondents received education on these pillars only occasionally or rarely.

5.3.4 Pillars of Food Security and Educational Gaps

Analysis of Table 6 revealed stronger engagement in food utilization education, suggesting effective teaching strategies in this area. However, education around food accessibility and stability showed lower engagement, revealing significant gaps that need to be addressed in future programming.

Table 14 indicated that awareness of facility-level health education (coefficient = 1.081703) and technology-based approaches (coefficient = 1.117291) were both statistically significant at the 5% level, meaning they positively impact understanding of food security. Although awareness of institutional-level strategies also had a positive coefficient, it was not statistically significant, suggesting it has a lesser effect on comprehension compared to facility-based or technological methods.

5.3.5 Perception, Satisfaction, and Understanding

Table 15 revealed that satisfaction with health education positively and significantly correlates with a better understanding of food security. When individuals find the content informative and relevant, their understanding improves. Similarly, food accessibility—when perceived as adequate—was linked to a stronger perception of food security.

Interestingly, while food availability had a statistically significant but negative coefficient, this suggests that availability alone doesn't guarantee positive perceptions of food security. Issues like food quality, variety, and distribution may influence these perceptions. Food stability and food utilization, although positively associated with perceived food security, were not statistically significant, indicating they may play a less central role in shaping perceptions compared to other factors.

5.3.6 Barriers and Recommendations

Several barriers to effective health education delivery were identified: economic shock (86%), social barriers (59.2%), access issues (42.6%), governance (29.6%), and cultural/religious factors (29.4%). Key recommendations included increasing funding (75%), reviewing health education policies (50%), building capacity among educators (56%), community involvement (54%), and reevaluating existing strategies and delivery models (40% and 30%, respectively).

Governance emerged as a statistically significant barrier in the regression analysis, with a positive coefficient indicating its association with reduced program effectiveness. Poor governance—manifested through weak policies, corruption, or inadequate coordination—can delay or obstruct the distribution of health education resources. Effective governance, on the other hand, is critical for ensuring proper allocation of funds, trained personnel, and robust infrastructure.

5.4 Conclusion

Based on the overall objective of assessing the dynamics of health education programs on food security among refugees in the Dadaab Refugee Camp, the study reveals a complex interplay between awareness levels, demographic factors, delivery approaches, and systemic barriers. While community-based strategies showed the highest awareness and engagement, significant gaps remain in institutional, facility, and technology-based approaches, often due to communication challenges and limited access. The findings also underscore that factors such as duration of stay, income sources, and satisfaction with educational content significantly influence understanding of food security. However, less than a third of participants receive consistent education, and more than half lack knowledge of key food security pillars, particularly food stability and accessibility. Additionally, poor governance, economic shocks, and social barriers were identified as major hindrances to effective program delivery. Overall, the study highlights the need for targeted, well-coordinated, and inclusive health education strategies, supported by strong governance and community participation, to enhance food security outcomes in Dadaab. The findings offer valuable insights aligned with the four research objectives.

First, regarding the assessment of health education strategies (Objective i), the study revealed that community-based strategies were the most recognized and well-received, while technology-based

approaches showed lower levels of awareness, likely due to challenges in digital access and literacy. Facility-based and institution-based strategies demonstrated moderate awareness but require improved communication and visibility. These findings underscore the uneven reach of existing health education strategies and the need for more inclusive and adaptive delivery models.

Second, in analysing the nexus between participation in health education and food security (Objective ii), results showed a clear correlation between exposure to health education and enhanced understanding of food security. Long-serving refugees and those with access to income or non-aid-based food sources demonstrated greater comprehension. Furthermore, satisfaction with the content and the perception of it being informative were significantly linked to improved awareness and favourable attitudes toward food security, indicating the value of quality and consistency in educational efforts.

Third, in identifying the key factors influencing the success of health education (Objective iii), the study highlighted several demographic and systemic elements. Awareness of delivery methods especially at the facility and technology levels—positively impacted understanding. However, barriers such as economic shocks, social exclusion, limited access, weak governance, and cultural constraints were significant impediments. Among these, governance emerged as a statistically significant factor, emphasizing the importance of policy coordination, leadership, and accountability in program success.

Finally, in exploring strategies to enhance health education for improved food security (Objective iv), the findings point to several actionable recommendations. These include increasing funding for health education programs, reviewing current policies and delivery models, strengthening the capacity of health educators, and involving communities in the design and implementation of educational initiatives. Emphasis should also be placed on diversifying delivery channels—especially through community-based and digital approaches—while tailoring content to reflect the needs of newly arrived refugees and other vulnerable groups.

In conclusion, improving food security in Dadaab requires a multi-dimensional approach to health education, one that is accessible, responsive to demographic differences, backed by strong governance, and driven by community engagement. Addressing these areas will ensure that health

education strategies do not just inform but also empower refugees to make informed decisions about their nutrition and well-being.

5.5 Recommendations

To effectively improve food security outcomes in the Dadaab Refugee Camp, it is crucial to develop a multi-dimensional, inclusive, and adaptive health education framework that integrates community-based outreach, improved institutional coordination, digital access, and strong governance. Programs must be tailored to demographic realities, such as length of stay and access to income, and designed to consistently cover all four pillars of food security. A centralized coordination body involving government, humanitarian agencies, and community leaders should be strengthened to oversee policy implementation, monitor educational outcomes, and ensure equitable distribution of resources and information.

Recommendation Based on Objective i: Assessment of Health Education Strategies

Given the uneven awareness across different health education strategies, a strategic rebalancing is required. Community-based approaches should be scaled up and replicated, as they have shown the highest levels of awareness and engagement. For facility-based and institution-based strategies, improved signage, outreach, and partnerships with local leaders can enhance visibility. To address the lower awareness of technology-based strategies, investment should be made in digital literacy training and infrastructure such as solar-powered devices or community tech hubs to bridge the digital divide and extend reach.

Recommendation Based on Objective ii: Nexus Between Participation and Food Security

Participation in health education clearly improves understanding of food security. Therefore, consistent and repeated exposure to health education must be prioritized. Programs should be integrated into everyday refugee life—through schools, health clinics, community centres, and even informal gatherings. Special focus should be placed on long-serving refugees to act as peer educators or mentors for newcomers. Furthermore, ensuring the quality and relevance of educational content—by making it context-specific, culturally sensitive, and interactive—will enhance both participation and impact.

Recommendation Based on Objective iii: Key Factors Influencing Success

Addressing systemic barriers is critical. Economic shocks, governance challenges, and social exclusions can derail even the best-designed programs. The government and aid agencies should

establish a multisectoral taskforce to tackle these structural issues. This includes policy reforms to improve coordination, anti-corruption measures, and social inclusion programs for marginalized groups. Additionally, emergency preparedness funds should be set aside to mitigate the impact of economic and environmental shocks on food security education programs. Governance mechanisms must be strengthened to ensure accountability and effective service delivery.

Recommendation Based on Objective iv: Strategies to Enhance Health Education

To enhance health education and its impact on food security, efforts must be made to increase funding specifically earmarked for training educators, updating materials, and conducting outreach. A comprehensive review of current health education models is needed to identify gaps and inefficiencies. Programs should adopt blended delivery methods, combining in-person community engagement with mobile-based messaging and digital tools. Moreover, community involvement should be institutionalized refugees must be active participants in the planning, design, and feedback loops of these programs to ensure relevance and ownership.

5.6 Suggestions for Further Research

The suggestions for further research were based on each of the four objectives, aligned with the overall findings of the study on the dynamics of health education programs and food security in Dadaab Refugee Camp:

1. A longitudinal or experimental design could help determine which health education delivery model produce the most sustained knowledge gains and behavioural changes. Additionally, studies should explore the role of digital innovations in health education, assessing their feasibility and impact in low-connectivity refugee settings.
2. Further investigation is needed into how depth and frequency of participation in health education programs influence actual food security outcomes, such as nutritional status or food diversity. Qualitative studies could also explore the motivations and barriers to participation, especially among underrepresented groups (e.g., newly arrived refugees, women, youth). Moreover, research could examine the long-term impact of educational interventions on self-reliance and resilience in food access.
3. Future research should delve deeper into the interplay between governance structures and program effectiveness by comparing camps or regions with different administrative models.

4. Further studies should test and evaluate innovative and context-specific strategies to enhance health education delivery. This includes pilot projects that integrate mobile learning platforms, peer-to-peer education models, and participatory co-design of content with refugee communities. Exploring how to embed health education within broader humanitarian programming such as livelihood support could also yield integrative, sustainable approaches.

6.0 REFERENCES

- Abdi, A. M. (2005). In limbo: Dependency, insecurity, and identity amongst Somali refugees in Dadaab camps. *Refuge*, 22(2), 6–14. <https://doi.org/10.25071/1920-7336.21328>
- Abdi, A. N. (2013). Impact of climate refugees on the humanitarian situation: A case study of Dadaab refugee camp (Master's thesis, University of Nairobi).
- Agrawal, P., Phadke, M., Du, N., Hosain, F., Koons, L., Brown, C., O'Malley, S., & Cheng, F. Y. (2024). Enhancing the health knowledge and health literacy of recently resettled refugees through classroom-based instructional methods. *Health Education Research*, 39(1), cyae001. <https://doi.org/10.1093/her/cyae001>
- Aljadeeah, S. (2022). Are refugees (really) a hard-to-survey group? Fieldwork experience with Syrian refugees in Germany. *Journal of Refugee Studies*, 35(3), 1405–1409.
- Anwar, A., Ali, A. M. M., Yadav, U. N., Huda, M. N., Rizwan, A. A. M., & Parray, A. A. (2024). Promotion of livelihood opportunities to address food insecurity in Rohingya refugee camps of Bangladesh. *Global Public Health*, 19(1), Article 2295446. <https://doi.org/10.1080/17441692.2023.2295446>
- Aouinti, H., Salcedo-Castro, J., Rouabhia, I., Bergaoui, K., Romero, C., Nasr, Z., & Touhami, I. (2024). Exploring the spatio-temporal variability of climate extreme indices over Tunisia: Observation and projection trends. In *Advances in Science, Technology and Innovation* (pp. 353–356). https://doi.org/10.1007/978-3-031-51904-8_79
- Aubery, F., & Buisson, M. C. (2024). Making ends meet in refugee camps: Food distribution cycles, consumption and undernutrition. *Food Policy*, 128, 102666. <https://doi.org/10.1016/j.foodpol.2024.102666>
- Beryne, S. (2015). Influencing women's attitudes and intentions to enhance exclusive breastfeeding in Kenya: Value of health education and peer counselling [Master's thesis, University of Washington]. <http://hdl.handle.net/1773/26434>
- Bhaskar, R. (1978). *A realist theory of science* (2nd ed.). Harvester Press.
- Burkardt, A. D., Krause, N., & Rivas Velarde, M. C. (2019). Critical success factors for the implementation and adoption of e-learning for junior health care workers in Dadaab refugee camp, Kenya. *Human Resources for Health*, 17(1), 98. <https://doi.org/10.1186/s12960-019-0435-8>
- Chkam, H. (2016). Aid and the perpetuation of refugee camps: The case of Dadaab in Kenya 1991–2011. *Refugee Survey Quarterly*, 35(2), 79–97.

- Christine, O., & Ernest, M. E. (2011). The effect of global economic crisis on service delivery in selected non-governmental organizations in Kenya. *Journal of Management and Strategy*, 2(4). <https://doi.org/10.5430/jms.v2n4p101>
- Claire MacPherson, & Sterck, O. (2019). Humanitarian vs. development aid for refugees: Evidence from a regression discontinuity design. CSAE Working Paper Series 2019-15, Centre for the Study of African Economies, University of Oxford.
- Dutta, H. (2024). Insights into different facets of the refugee crises–environment nexus. *Journal of Social and Economic Development*, 26(3), 1120–1143.
- Esin, K., Işık, T., Ayyıldız, F., Koc, M., & Vatanparasat, H. (2024). Prevalence and risk factors of food insecurity among Syrian refugees in Türkiye. *BMC Public Health*, 24, 1748. <https://doi.org/10.1186/s12889-024-19129-x>
- FAO. (2020). Nutrition education in primary schools: A planning guide for curriculum development. Food and Agriculture Organization of the United Nations.
- FAO. (2022). The state of food security and nutrition in the world 2022: Repurposing food and healthy diets more affordable. <https://www.fao.org/3/cc0639en/online/cc0639en.html>
- Garcia, S. N., Osburn, B. I., & Jay-Russell, M. T. (2020). One health for food safety, food security, and sustainable food production. *Frontiers in Sustainable Food Systems*, 4, 1–9. <https://doi.org/10.3389/fsufs.2020.00001>
- Glanz, K., Rimer, B. K., & Viswanath, K. (Eds.). (2008). Health behavior and health education: Theory, research, and practice (4th ed.). Jossey-Bass.
- Government of Kenya. (2010). The Constitution of Kenya, 2010. Kenya Law Reports. www.kenyalaw.org
- Gundersen, C., & Ziliak, J. P. (2015). Food insecurity and health outcomes. *Health Affairs*, 34(11), 1830–1839. <https://doi.org/10.1377/hlthaff.2015.0645>
- He, P., Dai, W., Luo, Y., Ding, R., & Zheng, X. (2022). Towards sustainable development goals: Study on the consequences of food insecurity among global population - Worldwide, 2022. *China CDC Weekly*, 4(27), 583–587. <https://doi.org/10.46234/ccdcw2022.128>
- Hejazi, J., Aminzare, M., Ayatollahi, Y., Vakili, M. M., Hassanzadazar, H., & Rahimlou, M. (2023). Effect of a comprehensive nutrition education program on nutritional behavior and food security of female-headed households who receive welfare support in Zanjan Province, Iran. *BMC Public Health*, 23(1), 1512. <https://doi.org/10.1186/s12889-023-16478-x>
- Hoque, M. M., & Yunus, M. (2020). Livelihood diversity of forcibly displaced Rohingyas encamped in Bangladesh. *The Bangladesh Development Studies*, 43(3/4), 77–119.
- International Rescue Committee. (2024, March 21). New IRC data shows that hunger has increased for Rohingya refugees by nearly 60% in one year. <https://www.rescue.org/press-release/new-irc-data-shows-hunger-has-increased-rohingya-refugees-nearly-60-one-year>

- Ismal, S. (2020). Do education and health influence economic growth and food security? Evidence from Bangladesh. *International Journal of Human Development*, 6(1), 59–75.
- Kaya, C. (2015). Internal validity: A must in research designs. *Educational Research and Reviews*, 10(2), 111–118. <https://doi.org/10.5897/ERR2014.1835>
- Kenya National Bureau of Statistics (KNBS). (2023). Kenya's refugee population climbs to 691,868 in 2023. <https://www.knbs.or.ke>
- Ladiqi, S., Ahmad, A. A., Ramlan, A. Z., Farhana, N., & Noor, M. (2020). Importance of food security: Rohingya refugee in Cox's Bazar camp. *International Journal of Psychosocial Rehabilitation*, 24, 2020. <https://www.researchgate.net/publication/344608418>
- Machalaba, C. C., et al. (2018). Institutionalizing One Health: From assessment to action. *Health Security*, 16(S1), S37–S43. <https://doi.org/10.1089/hs.2018.0064>
- Mardones, F. O., et al. (2020). The COVID-19 pandemic and global food security. *Frontiers in Veterinary Science*, 7, 578508. <https://doi.org/10.3389/fvets.2020.578508>
- Mijwanga, S. O., & Cheptum, J. J. (2022). Role of community health volunteers in education and promotion of birth preparedness to support maternal healthcare services in the Dadaab refugee camp, Kenya. *African Journal of Midwifery and Women's Health*. <https://doi.org/10.12968/ajmw.2021.0010>
- Mire, A. (2023). The influx of Somali refugees into Kenya and the challenges faced by Dadaab. UNHCR Dadaab Stories. <https://www.unhcr.org/news/stories/kenya-s-dadaab-struggles-new-influx-somalis-fleeing-drought>
- Mortazavi, Z., et al. (2021). Nutritional education and its effects on household food insecurity in southeastern Iran. *Iranian Journal of Public Health*, 50(4), 798–805. <https://doi.org/10.18502/ijph.v50i4.6006>
- Nair, S., et al. (2022). Assessing barriers, opportunities and future directions in health information sharing in humanitarian contexts: A mixed-method study. *BMJ Open*, 12(4), e053042. <https://doi.org/10.1136/bmjopen-2021-053042>
- Nisbet, C., Lestrat, K. E., & Vatanparast, H. (2022). Food security interventions among refugees around the globe: A scoping review. *Nutrients*, 14(3), 522. <https://doi.org/10.3390/nu14030522>
- Pérez-Expósito, A. B., & Klein, B. P. (2009). Impact of fortified blended food aid products on nutritional status of infants and young children in developing countries. *Nutrition Reviews*, 67(12), 706–718. <https://doi.org/10.1111/j.1753-4887.2009.00255.x>
- Piper, B., Dryden-Peterson, S., Chopra, V., Reddick, C., & Oyanga, A. (2020). Are refugee children learning? Early grade literacy in a refugee camp in Kenya. *Journal on Education in Emergencies*, 5(2), 71–107. <https://doi.org/10.33682/flwr-yk6y>

- Ramesh, A., Blanchet, K., Ensink, J. H., & Roberts, B. (2015). Evidence on the effectiveness of water, sanitation, and hygiene (WASH) interventions on health outcomes in humanitarian crises: A systematic review. *PLOS ONE*, 10(9), e0124688. <https://doi.org/10.1371/journal.pone.0124688>
- Ruel, M. T., Alderman, H., & Maternal and Child Nutrition Study Group. (2013). Nutrition-sensitive interventions and programmes: How can they help to accelerate progress in improving maternal and child nutrition? *The Lancet*, 382(9891), 536–551. [https://doi.org/10.1016/S0140-6736\(13\)60843-0](https://doi.org/10.1016/S0140-6736(13)60843-0)
- Ruibal, A. L. (2022). The impact of nutrition education programs on food security status: A systematic review. *International Journal of Environmental Research and Public Health*, 19(9), 5360. <https://doi.org/10.3390/ijerph19095360>
- Salmons, J. (2022). *Qualitative online interviews: Strategies, design, and skills* (2nd ed.). Sage Publications.
- Shaffer, A., & Fiedler, J. L. (2022). Nutrition education for improved food security and nutrition outcomes: A review of evidence and lessons learned. *Global Food Security*, 33, 100631. <https://doi.org/10.1016/j.gfs.2022.100631>
- Shishehgar, S., Gholamhosseini, L., & Kremer, P. (2017). A systematic review of research into how refugee families integrate into host country healthcare services. *International Journal for Equity in Health*, 16(1), 1–18. <https://doi.org/10.1186/s12939-017-0682-4>
- Sternin, M., Sternin, J., & Marsh, D. (1997). Rapid, sustained childhood malnutrition alleviation through a "positive deviance" approach in rural Vietnam: Preliminary findings. *Save the Children Federation*.
- Swigart, T. M., Bonvecchio, A., Théodore, F. L., & Lapping, K. (2017). A review of design and implementation characteristics of nutrition social and behavior change communication (SBCC) interventions. *Maternal & Child Nutrition*, 13(S1), e12476. <https://doi.org/10.1111/mcn.12476>
- Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education*, 48(6), 1273–1296. <https://doi.org/10.1007/s11165-016-9602-2>
- Tura, G., & Gathi, C. M. (2022). The relationship between food insecurity and child malnutrition among refugees in Dadaab, Kenya. *BMC Nutrition*, 8(1), 8. <https://doi.org/10.1186/s40795-022-00505-6>
- UNHCR. (2023). Kenya country refugee response plan: January–December 2023. United Nations High Commissioner for Refugees. <https://reliefweb.int/report/kenya/kenya-country-refugee-response-plan-january-december-2023>
- UNHCR. (2024). Dadaab refugee complex population statistics. United Nations High Commissioner for Refugees. <https://www.unhcr.org/ke/dadaab-refugee-complex>
- UNICEF. (2023). State of the world's children 2023: For every child, vaccination. <https://www.unicef.org/reports/state-worlds-children-2023>

WFP. (2023). Food security assessment in Dadaab refugee camps: November 2023. World Food Programme. <https://www.wfp.org/publications>

WHO. (2021). World report on health equity. World Health Organization. <https://www.who.int/publications/i/item/9789240028508>

7.0 APPENDICES

Appendix 1: Informed Consent

Informed Consent (Sample)

My name is Nelly Saiti Barasa. I am a master's student from African Nazarene University. I am conducting a study on the dynamics of health education programmes in food security in Dadaab refugee camp and surrounding host community in Kenya. The information will be used by humanitarian actors, ministry of health and stakeholders to improve health and nutrition programme towards food security in Kakuma refugee camp.

Procedures to be followed.

Participation in this study will require that I ask you some questions and I also examine you to screen you for eligibility to participate in the study.

To participate in this study, I will ask you some questions and assess you to determine your eligibility.

We are asking to interview you since you may have information that can help us learn about the health education programmes in respect to food security in Dadaab camp and surrounding host community.

We'd like to interview you because you may have information that might help us understand more about the health education programs for food security in Dadaab camp and the adjacent host communities.

You have the right to refuse participation in this study. You will not be victimized in any way for your decision to join the study or not.

Please remember the participation in this study is voluntarily. You may ask questions related to the study at any time.

Please keep in mind that your participation in this study is completely voluntary. You may ask questions about the study at any time.

You may refuse to respond to any questions, and you may stop an interview at any time. You may also stop being in the study at any time without any consequences to the services you receive any organization now or in the future.

You may refuse to answer to any questions and may also stop an interview at any time. You may also discontinue participation in the study at any time without affecting the services you receive from any organization now or in the future.

Discomforts and Risks

Some of the questions you will be asked are sensitive and may be embarrassing or make you uncomfortable. If this happens, you may refuse to answer these questions if you so choose. You may also stop the interview at any time. The interview may take up approximately forty-five minutes of your time.

Some of the questions you will be asked are sensitive and may make you feel embarrassed or uncomfortable. If this occurs, feel free not to respond to these questions and ask to skip the question. You can at any time also stop the interview. The interview may take roughly 45 minutes of your time and at most convenient location.

Benefits

There are no direct benefits to you from taking part in this study. However, we will use the information that you provide to us for the purposes of improving the body of knowledge and for decision-making.

You will not receive any direct rewards or benefit from participating in this study. However, we will use the information you provide to help us improve the body of knowledge and make decisions.

If you participate in this study, you will help us to understand the dynamics of health and nutrition programmes and influence on food security in Kakuma camp.

If you participate in this study, you will help us understand the dynamics of health and nutrition interventions and their impact on food security in Dadaab camp.

Reward

If you agree to participate in this study, it is voluntary and has no payment for participation. You will not receive any payment for participation in this research study.

Confidentiality

The interviews and examinations will be conducted in a private setting within your office or selected venue. Your name will not be recorded on the questionnaire. The questionnaires will be kept in a locked cabinet for safe keeping at Africa Nazarene University. Everything will be kept private.

The interview and examinations will be held in private comfortable venue like office. Any information that is obtained in connection with this study and that can be identified with you will be kept confidential and will be disclosed only with your permission or as required by law. Your name will not be recorded on the questionnaire. The questionnaires will be kept in a locked cabinet for safe keeping at Africa Nazarene University. Everything will be kept private.

Contact Information

In case have any questions, you may contact Dr. Micky Mwamuye or Dr. Daniel Namanya or African Nazarene University review committee.

Participant's statement

The above information regarding my participation in the study is clear to me. I have been given a chance to ask questions and my questions have been answered to my satisfaction. My participation in this study is entirely voluntary. I understand that my records will be kept private and that I can leave the study at any time. I understand that I will still be treated the same way whether I decide to leave the study or not and my decision will not change the services I receive from any organization at any other time.

The aforementioned information about my participation in the study is clear to me. I have been given the opportunity to ask questions, and they were answered to my satisfaction. My participation in this study is completely voluntary. I understand that my records will be kept confidential, and that I may exit the study at any time. I realize that whether I choose to leave the study or not, I will be treated the same way, and my decision will have no effect on the services I receive from any organization in the future.

Name of Participant

Signature or Thumbprint

Date

Investigator's statement

I, the undersigned, have explained to the volunteer in a language s/he understands, the procedures to be followed in the study and the risks and benefits involved.

Name of Interviewer

Signature or Thumbprint

Date

Appendix 2: Questionnaire Guide (Household Interview, Key Informant Interview and Focus Group Discussion)

DYNAMICS OF HEALTH EDUCATION IN FOOD SECURITY IN DADAAB REFUGEE CAMP AND SURROUNDING HOST COMMUNITY IN KENYE

Subject ID Number _____
Research Site: Dadaab Refugee Camp
Study Site: Garissa County, Kenya
Location of Interview _____
Date (day/month/year) : |__| |__| |__|
Interviewer Name _____
Interviewer Code _____
Record Time Interview Begins: Hours: |__| **Minutes:** |__|

SECTION A: SOCIO-DEMOGRAPHIC INFORMATION

No.	Question	Response options	Codes	Skip
1.	What is your sex?	Male Female	1 2	
2.	Category of beneficiaries	Long staying refugees Newly arrived refugees and asylum seekers Host Community Members	1 2 3	
3.	How old are you?	Young adults 18-39 Middle-aged adults 40-59 Old Adults 60+	1 2 3	
4.	What is camp of residence?	Dagahaley Hagadera Ifo N Ifo 2	1 2 3 4	
5.	Do you have access to income? (Self, relatives, friends, employment)	No Yes	0 1	

No.	Question	Response options	Codes	Skip
6.	What is your current marital status?	Married Divorced Separated Never Married Widowed	1 2 3 4 5	
7.	Level of Education	None Primary school Secondary school Post-secondary school- TVET, College, University, certificate) Traditional/ Informal- Provided by women, Elderly or religious leaders	0 1 2 3 4	
8.	What is the main source of food in your household?	Food Aid Ration Cash Based transfer (Bamba Chakula) Direct purchases from traders Farming (Crop or animal) Borrowing Others..... Specify	1 2 3 4 5 6	
9.	Who is the main provider of the food?	World Food Programme Friends and relatives Farming/ Own production Employed/ Own production. Others..... Specify.	1 2 3 4 5	

OBJECTIVE 1: HEALTH EDUCATION STRATEGIES ON FOOD SECURITY

1.1 What approach/ strategy are you aware that is used for delivery health education message on food security? (Scale of 1 to 5; 1 Not at all aware, 2 Slightly aware, 3 Moderately Aware, 4 Very Aware and 5 Extremely Aware)

Response Set	1	2	3	4	5
Facility Based: Ministry of health- Health providers; NGO workers (Partnership Collaboration)					
Institution Based: Curriculum Integration- Schools and other institutions of learning; Training and Capacity building.					
Community Based Strategies: Community Engagement- House to house visits, Community dialogue, Community action days, focus group discussions, support groups, mass media campaign.					
Technology: Mobile Applications, Bulk SMS, social media.					
Others... Specify.					

1.2 What are your most preferred approaches/ strategies for receiving health education on food security? (Scale of 1 to 5; 1 Not preferred, 2 Least Preferred, 3 Somewhat Preferred, 4 Preferred and 5 Most Preferred)

Response Set	1	2	3	4	5
Facility Based: Ministry of health- Health providers; NGO workers (Partnership Collaboration)					
Institution Based: Curriculum Integration- Schools and other institutions of learning; Training and Capacity building.					

Community Based Strategies: Community Engagement- House to house visits, Community dialogue, Community action days, focus group discussions, support groups, mass media campaign.					
Technology: Mobile Applications, Bulk SMS, social media.					
Others... Specify.					

1.3 How satisfied are you with the current health education strategies used?

Response Set	1	2	3	4	5
Frequency	Not at all Satisfied	Slightly Satisfied	Moderately Satisfied	Very Satisfied	Completely Satisfied

1.4 How do you perceive the use of these strategies in the delivery of health education on food security in the refugee camp and its surrounding?

Response Set	1	2	3	4	5
Frequency	Not at all Informative	Slightly Informative	Moderately Informative	Very Informative	Extremely Informative

1.5 How would you rate the performance standards of delivery of health education in food security in relation to the 4 pillars of food security? (1- far below standards, 2- Below standards, 3-Meets Standards, 4- Above standards, 5-Far above standards)

Response Set	1	2	3	4	5
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Utilization of Food (Food and nutrition knowledge, preparation of food and nutrition behaviour, cultural traditions, health status, standards, health status, hygiene, care opportunities)					
Food Accessibility (Income, Prices, markets, Transfer, Infrastructure, Food distribution, gender issues)					
Food Availability (Crop/ Animal Production, Efficient water use, Stocks, Trade)					
Food Stability (Continuous adoption of the above three pillars).					

OBJECTIVE 2: NEXUS BETWEEN PARTICIPATION IN HEALTH EDUCATION AND FOOD SECURITY

2.1. Do you understand what health education on food security means? (If no, explain in the context of the four food security pillars and the packages offered by health education stakeholders)

Yes-(1)

No-(0)

2.2. If yes, are aware of the organizations or entities providing health education on food security in Dadaab?

Yes- (1)

No-(0)

2.2.1 If yes in 2.2 above, please describe aspects of health education on food security provided by the health educators that you are ware of

2.3 How often do you receive health education on food security? (*Probe for dietary diversity, malnutrition, food access, food availability, complementary feeding e.t.c*)

Response Set	1	2	3	4	5
Frequency	Never	Rarely	Sometimes	Often	Always/ Every time

2.2 How often would you like to receive health education on food security?

Response Set	1	2	3	4	5
Frequency	Never	Rarely	Sometimes	Often	Always/ Every time

2.3 Under what pillar of food security did you receive the most health education on food security? (*Scale of 1 to 5; 1 very rarely, 2 rarely, 3 Occasionally, 4 frequently and 5 very frequently*)

Response Set	1	2	3	4	5
Food Utilization (Food and nutrition knowledge, food preparation and nutrition behaviour, cultural traditions, health status, standards, health status, hygiene, care opportunities)					
Food Accessibility (Income, Prices, markets, Transfer, Infrastructure, Food distribution, gender issues)					
Food Availability (Crop/ Animal Production, Efficient water use, Stocks, Trade)					
Food Stability (Continuous adoption of the above three pillars).					

2.4 What aspects of the message have you adopted the most in your day-to-day life? (*Scale of 1 to 5; 1 very rarely, 2 rarely, 3 Occasionally, 4 frequently and 5 very frequently*)

Response Set	1	2	3	4	5
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Food Utilization (Food and nutrition knowledge, food preparation and nutrition behaviour, cultural traditions, health status, standards, health status, hygiene, care opportunities)					
Food Accessibility (Income, Prices, markets, Transfer, Infrastructure, Food distribution, gender issues)					
Food Availability (Crop/ Animal Production, Efficient water use, Stocks, Trade)					
Food Stability (Continuous adoption of the above three pillars).					

2.5 How well do you believe health education best inform you about food security?

Response Set	1	2	3	4	5
Frequency	Not Much	Little	Somewhat	Much	A great deal

2.6 To what extend do you find the health education on food security useful and actionable?

Response Set	1	2	3	4	5
Frequency	Not Useful and actionable	Of little Importance	Somewhat useful and actionable	Useful and actionable	Not useful and actionable

2.7 In your opinion, has health education positively influenced your awareness and knowledge of food security?

Response Set	1	2	3	4	5
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Frequency	Not Influenced	Little Influence	Moderately Influenced	Much Influence	Strongly Influenced
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OBJECTIVE 3: Key Factors Contributing to the successful delivery of health education on food security in Dadaab.

3.1 What are the barriers to the successful delivery of health education in food security in the camp?

- (1) Economic Barriers – Finances, Staffing, sale of food aid, increased prices, access to markets, inadequate food, inadequate energy
- (2) Social Barriers- Language, theft, Illiteracy, Inter-clan conflicts over resources
- (3) Access Barriers- Insecurity, Police brutality, Distance to services, Inadequate storage, GBV,
- (4) Governance Barriers- Leadership, Policy and Regulations
- (5) Cultural and religious barriers- Traditional knowledge, Stereotypes, myths, misconceptions
- (6) Capacity/ training of health education providers
- (7) Other... Specify.

3.2 How do barriers to successful delivery of health education affect food security?

1. I will not be able to know food security problem affecting us.
2. If faced with a food security problem, I may not know how to solve it.
3. Food security will decrease.
4. I will be misinformation on food security problems and solutions.
5. There will be increase in diseases.
6. There will be increase in death.
7. Others..... Specify

3.3 What recommended actions should be taken to address these barriers? (Multiple choice question)

1. Increased funding for health education strategies
2. Review health education guidelines or policies
3. Build capacity of health education providers
4. Involve community when planning, designing, implementation health education guidelines.
5. Review current health education strategies.
6. Review the current model used in delivery of health education on food security.
7. Other.....Specify.

INTERMEDIATE VARIABLES: ENVIRONMENT (Knowledge, Capacity, Technology e.t.c) AND POLICY AND REGULATIONS

4.0 What is your current knowledge of food security situation in Dadaab relation to the four pillars (Food availability, food access, food utilization and food stability)? . (1- Strongly disagree, 2-Disagree, 3-Neither agree nor disagree, 4- Agree, 5- Strongly agree)

Food Availability	1	2	3	4	5
Household acquired food production assets and resources (labor, finance, and agricultural inputs).					
The household is willing to change current food production practices.					
Household members acquired knowledge on nutrition-sensitive productive technologies and practices					
Household members have access to fertile land, water, and ecosystem services to ensure food security					
Household members have knowledge and skills to improve food production					
Household has access to local, regional, and global food market.					

Food Access	1	2	3	4	5
The household member is aware of the required documentation to enable access to food and nutrition services/ supplies					
The household members have access to food aid (GFD, SFP).					

Food security decisions are equitably made by both women and men in the household.					
Household income has increased.					
Household has access to secure income-generating activity.					
Household has access to markets/ traders without barriers					
Either of the gender in the household decides what happens to the food/ cash/ voucher received in the household.					
Household member has not experienced gender-based violence (GBV) incidents					

Food Stability	1	2	3	4	5
Households are growing nutrition-sensitive					
Household has access to efficient energy sources that are sensitive to health outcomes.					
Households are growing climate- adapted crops/breads					
Households have land restoration mechanisms in place that include Management and conservation of soil and water.					
Households implement preparedness plans to protect lives and assets in the event of an emergency/ shock.					
Households have put in place positive food security coping strategies.					
The household has access to efficient and effective food storage facilities.					
The household has access to non-food items					
The household has access to health services					

Food Utilization	1	2	3	4	5
Household has access to clean water.					
Household has access to a functional latrine					
Household has good solid waste management practices					
All households diversify their diet					

All household has the skills and knowledge on food safety					
All household members have good nutrition status					
No household member is malnourished					
No household member is affected by diarrhoea					
Household have changed food consumption practices					
Household changed their method of food preparation					

4.1 We have reached the end of our interview. Do you have any additional suggestions for health education on food security in Dadaab?

Key Informant Interview Guide

Date (dd/mm/yy)	Interview number

To be completed by the interviewer

1. Introduction

This Key informant interview guide aims to assess the dynamics of health education on food assistance in Dadaab. The key thematic areas in the interview guide will be drawn from three specific objectives: health education strategies on food security, the nexus between health education and food security, and barriers hindering the success of health education on food security.

(Ask for either verbal or written informed consent after reading and explaining the content of the consent form to study participants).

1.1 What is your current role or position? **(WRITE THE RESPONSE BELOW)**

1.2 What is your current place of work or institution? **(WRITE THE RESPONSE BELOW)**

1.3 Are you a representative of: **(READ THE RESPONSES BELOW AND CHECK ALL THAT APPLY)**

- | | | |
|--------------------------|----|--|
| ☐ | 1. | Food Assistant Humanitarian Organization |
| ☐ | 2. | Health and Nutrition Humanitarian Organization |
| ☐ | 3. | Education Providing Humanitarian Organization |
| ☐ | 4. | Communication Humanitarian Organization |

☐	5.	The Ministry of Education
☐	6.	Camp coordination Humanitarian Organization
☐	7.	The Ministry of Health
☐	8.	Private Provider of Health and Nutrition Services
☐	9.	Private Provider of Education
☐	10.	Camp Leadership
☐	11.	Private provider of food assistance
☐	12.	Others Specify

2.	Health Education Strategies on Food Security
----	---

2.1 In your opinion, what approaches/ strategies are used to deliver health education on food security in Dadaab? (**CHECK ALL THAT APPLY**)

☐	1.	Communication Providing Humanitarian Organizations
☐	2.	Local Radio Stations
☐	3.	Community-Based Structures (CHWs, MYCN Counsellors)
☐	4.	Education Providing Humanitarian Organizations
☐	5.	Health and Nutrition Providing Humanitarian Organization
☐	6.	Food Assistance Providing Humanitarian Organizations
☐	7.	Established government structures (MOH, MOE e.t.c)
☐	8.	Other
	(SPECIFY):	

2.2 Based on your feedback provided above, what areas of food security are health education approaches effectively employed? (**PROBE FOR FOOD ACCESS, AVAILABILITY, UTILIZATION, STABILITY**).

☐	1.	Food Access (Economic, Physical and Social) – Household financial access to food (income), Household financial or physical ability to produce crops/livestock, Prevention of livestock diseases, market prices
☐	2.	Food Availability-Alternatives to dependency on aid, Access to markets, stock levels/ available supplies, level of crop production/ engaging in Agriculture, net trade
☐	3.	Food Utilization- Quality and Nutritional value of food, Health Seeking Behaviour, Hygiene and Sanitation, Feeding Practices
☐	4.	Food Stability (Weather conditions, political instability, unemployment, rising food prices,

2.3 In your opinion, have the current health education strategies positively influenced your knowledge and awareness of food security? (**CHECK ONE ANSWER**)

- | | | |
|--------------------------|----|-----------------------|
| ☐ | 1. | Strongly Influenced |
| ☐ | 2. | Moderately Influenced |
| ☐ | 3. | Not Influenced |

2.3.1 Why? Explain your answer.

2.4 In your opinion, what approaches/ strategies should be used to effectively deliver health education on food security in Dadaab? (**CHECK ALL THAT APPLY**)

- | | | |
|--------------------------|----|--|
| ☐ | 1. | Communication Providing Humanitarian Organizations |
| ☐ | 2. | Local Radio Stations |
| ☐ | 3. | Community-Based Structures (CHWs, MYCN Counsellors) |
| ☐ | 4. | Education Providing Humanitarian Organizations |
| ☐ | 5. | Health and Nutrition Providing Humanitarian Organization |
| ☐ | 6. | Food Assistance Providing Humanitarian Organizations |
| ☐ | 7. | Established government structures (MOH, MOE e.t.c) |
| ☐ | 8. | Other |
- (SPECIFY):

3. Nexus between health education and food security

a. Do you think health education has helped to address food security in Dadaab? (**CHECK ONE ANSWER**)

- | | | |
|--------------------------|----|--------------|
| ☐ | 1. | Yes |
| ☐ | 2. | No |
| ☐ | 3. | I don't know |

b. If yes above, how does health education address food security in Dadaab? (**CHECK ALL THAT APPLY**)

- | | | |
|--------------------------|----|---|
| ☐ | 4. | Food Utilization (Access to clean water and enhanced health and hygiene practices enhanced, improved health, and nutrition outcomes, food safety) |
| ☐ | 5. | Food Access (Reduced GBV, Increased household income, Increased participation of both genders in decision making, enhanced access to markets) |

☐	6. Food Availability (Households able to acquire production assets and resources, change in food production practices, food safety strategies, knowledgeable on nutrition sensitive production practices e.t.c)
☐	7. Food Stability (Environment regenerated, resilience achieved)
☐	8. Other (SPECIFY):

8.1 What is your opinion of the QUANTITY of health educators available for the food security programs? **(CHECK ONE BOX FOR EACH ITEM)**

Category of Health educators	Quantity of educators			
	I don't know 0	Poor 1	Adequate 2	Good 3
1. Teachers- Education Institution	☐	☐	☐	☐
2. Health Providers- Nurses, Clinicians, Doctors, CHWs, MYCN Counsellors	☐	☐	☐	☐
3. Communication Expertise- Communication Organization, Location Radio Station	☐	☐	☐	☐
4. Food Assistance Organization	☐	☐	☐	☐
5. Government Entities	☐	☐	☐	☐
6. Others... Specify	☐	☐	☐	☐

8.2 In your opinion, what steps should be taken to ensure health education on food security is able to covers all the FOUR pillars of food security? **(PROBE FOR FOOD UTILIZATION, FOOD ACCESS, FOOD AVAILABILITY, FOOD STABILITY) (CHECK ALL THAT APPLY)**

☐	1. More Health Educators
☐	2. Specific training Trailor made for health education on food security
☐	3. Specific strategy to be drafted for health education on food security
☐	4. Diversify current health education strategies- To be more digitized
☐	5. Continuing building capacity of the existing health educators
☐	6. Attractive salaries and benefits
☐	7. Career paths to be created specific for health educators on food security
☐	8. Opportunities for health educators to conduct food insecurity research
☐	9. Other (SPECIFY):

8.3 What opportunities are available in Dadaab for humanitarian workers/ government representatives/ community resource persons/ community leaders to acquire or keep their

knowledge and skills up-to-date specific to health education on food security? (**CHECK ALL THAT APPLY**)

☐	1.	In-service training courses offered by nongovernmental organizations and development partners
☐	2.	Access to the Internet Access and use of internet resources
☐	3.	Access to library of journals, textbooks, and other scientific publications
☐	4.	Conferences and professional forums
☐	5.	Workshops
☐	6.	Training provided by professional associations
☐	7.	In-service training courses offered by the government
☐	8.	Scholarships
☐	9.	None
☐	10.	Other
	(SPECIFY):	

8.4 In your opinion, what should be done to ensure that capacity developed humanitarian workers/ government representatives/ community resource persons/ community leaders in Dadaab stay in Dadaab and work to deliver health education on food security?

8.5 In your opinion, is there a need to provide/improve capacity development on health education on food security for humanitarian workers/ government representatives/ community resource persons/ community leaders in Dadaab (**CHECK ONE ANSWER**)

☐	1.	Yes
☐	2.	No
☐	3.	I don't know

3.6.1 If yes, what steps could be taken to provide/ improve health education on food security?

4. Barriers to Successful delivery of health education on food security

4.6 In your opinion, what has been barriers to the successful delivery of health education on food security in Dadaab? (**CHECK ALL THAT APPLY**)

☐	1.	Insecurity- Al-Shabaab, Clannism	
☐	2.	Logistical Challenges- vehicle availability, Staffing,	
☐	3.	Inaccessibility to Households- Population Pressure/ Congested blocks	
☐	4.	Policy and regulations- Lack of documentation, No existing guidelines/ strategies/policies	
☐	5.	Capacity- Training Opportunities/ Trained Staff/Updated Training Modules	
☐	6.	Resources- Funding	
☐	7.	Culture and Traditions-Strong believe in cultural practices	
☐	8.	Attitude- Normalized processes hence change not embraced.	
☐	9.	Innovation- Poor uptake of current technology	
☐	10.	I don't know	
☐	11.	Other	
		(SPECIFY):	

5.	Intermediate Variables
----	-------------------------------

4.3 In general, do you think the structures in place (Environmental, social, political, policy, Cultural) are sufficient to deliver quantity and quality health education on food security in Dadaab?
(CHECK ONE ANSWER)

☐	1.	Yes
☐	2.	No
☐	3.	I don't know

4.3.1 Please explain your answer.

--

5.2 What structures should be improved? **(PROBE FOR COMMUNITY STRUCTURES, HUMANITARIAN COORDINATION AND TECHNICAL STRUCTURES, GOVERNMENT STRUCTURES. In what ways should these structures be improved?)**

--

5.3 Does this organization have a policy or procedure specific for health education on food security or are you aware on any policy or procedure existing specific for health education on food security?

(CHECK ONE ANSWER)

- | | | |
|--------------------------|----|--------------|
| ☐ | 1. | Yes |
| ☐ | 2. | No |
| ☐ | 3. | I don't know |

5.4 If there is no policy or procedure specific for health education on food security in your organization or in place, do you think it's necessary to have one? (CHECK ONE ANSWER)

- | | | |
|--------------------------|----|--------------|
| ☐ | 4. | Yes |
| ☐ | 5. | No |
| ☐ | 6. | I don't know |

5.5 Are you aware of any documented strategy for delivery of health education on food security? (CHECK ONE ANSWER)

- | | | |
|--------------------------|----|--------------|
| ☐ | 4. | Yes |
| ☐ | 5. | No |
| ☐ | 6. | I don't know |

5.6 Is there a training Institution in Dadaab offering a curriculum on health education on food security in Dadaab? (CHECK ONE ANSWER)

- | | | |
|--------------------------|----|--------------|
| ☐ | 1. | Yes |
| ☐ | 2. | No |
| ☐ | 3. | I don't know |

5.6.1 If yes, what are the main goals of the curriculum? (CHECK ALL THAT APPLY)

- | | | |
|--------------------------|------------|---|
| ☐ | 1. | Producing new faculty |
| ☐ | 2. | Producing specialist practitioners |
| ☐ | 3. | Producing researchers |
| ☐ | 4. | Enhancing training and integration for refugees |
| ☐ | 5. | Enhancing the training of humanitarian workers |
| ☐ | 6. | Retaining health educators in Dadaab |
| ☐ | 7. | Enhancing training of host community |
| ☐ | 8. | Other |
| | (SPECIFY): | <input type="text"/> |

5.7 In your opinion, how frequently is information technology, such as computers, projectors, videos, social media etc. used in the delivery of health education on food security in Dadaab? (CHECK ONE ANSWER)

- | | | |
|--------------------------|----|--------------|
| ☐ | 1. | Always |
| ☐ | 2. | Sometimes |
| ☐ | 3. | Never |
| ☐ | 4. | I don't know |

5.8 In your opinion, is there a need to increase the availability and use of information technology in the delivery of health education on food security in Dadaab? (**CHECK ONE ANSWER**)

- | | | |
|--------------------------|----|--------------|
| ☐ | 1. | Yes |
| ☐ | 2. | No |
| ☐ | 3. | I don't know |

5.8.1 If yes, how can the use of information and technology be improved in the delivery of health education on food security?

--

5.9 Have research been conducted previously in Dadaab to enhance health education on food security? (**CHECK ONE ANSWER**)

- | | | |
|--------------------------|----|--------------|
| ☐ | 1. | Yes |
| ☐ | 2. | No |
| ☐ | 3. | I don't know |

5.9.1 If yes, what are the main sources of funding and support for research? (**CHECK ALL THAT APPLY**)

- | | | |
|--------------------------|----|-----------------------|
| ☐ | 1. | Donors such as USAID |
| ☐ | 2. | Ministry of Education |
| ☐ | 3. | Ministry of Health |
| ☐ | 4. | UN agencies |
| ☐ | 5. | INGOs/NGOs |
| ☐ | 6. | Other (SPECIFY): |
- | |
|--|
| |
|--|

5.10 What is your opinion on the number or amount of health education on food security, health educators, beneficiaries to be trained, area of coverage, and time allocated for health education on food security? (**CHECK ONE BOX FOR EACH ITEM**)

Health Education on food security	Quantity?			
	I don't know 0	Not enough 1	Enough 2	Too many or too much 3
1. Number of health education on food security sessions				
2. Number of health educators on food security				
3. Number of beneficiaries trained per session				
4. Time spent at training sessions				
5. Volume of health education on food security module				
6. Variety of targeted beneficiaries (Disabled, Women, Youth etc)				
7. Other (SPECIFY):				

6.0 What measures are applied in Dadaab to ensure the quality of health education on food security provided? (**CHECK ALL THAT APPLY**)

☐	1.	Rigorous criteria for recruitment of health educators
☐	2.	Periodic assessment of health educators, both internal and external
☐	3.	External Monitoring and evaluation of Health education on food security outcomes
☐	4.	Health Educators must obtain a standard certification
☐	5.	No quality assurance system exists
☐	6.	I don't know
☐	7.	Other
	(SPECIFY):	

6.1 In your opinion, is there a need for quality assurance for health education on food security in Dadaab? (**CHECK ONE ANSWER**)

☐	1.	Yes
☐	2.	No
☐	3.	I don't know

6.1.1 If yes, what key steps are needed to improve the system of quality assurance?

6.2 Does your entity work in partnership with another entity to deliver health education on food security? (**CHECK ONE ANSWER**)

- | | | |
|--------------------------|----|--------------|
| ☐ | 1. | Yes |
| ☐ | 2. | No |
| ☐ | 3. | I don't know |

6.2.1 If yes, what is the purpose of the partnership? (**CHECK ALL THAT APPLY**)

- | | | |
|--------------------------|----|--------------------------------------|
| ☐ | 1. | Leverage on Capacity |
| ☐ | 2. | Distance learning |
| ☐ | 3. | Sharing of technology |
| ☐ | 4. | Sharing of resources and materials |
| ☐ | 5. | Research |
| ☐ | 6. | Complementarity |
| ☐ | 7. | Internships or practice |
| ☐ | 8. | Resource Management- Reduced funding |
| ☐ | 9. | Other |
| | | (SPECIFY): |

6.3 Does your organization/ community/ entity offer exchanges for health education on food security? (**CHECK ONE ANSWER**)

- | | | |
|--------------------------|----|--------------|
| ☐ | 1. | Yes |
| ☐ | 2. | No |
| ☐ | 3. | I don't know |

6.3.1 If yes, what types of exchanges to other locations are available for health educators on food security? (**CHECK ALL THAT APPLY**)

- | | | |
|--------------------------|----|--------------------------|
| ☐ | 1. | Academic exchange |
| ☐ | 2. | Internships |
| ☐ | 3. | Teaching |
| ☐ | 4. | Service Delivery |
| ☐ | 5. | Research |
| ☐ | 6. | Sports |
| ☐ | 7. | Employment opportunities |
| ☐ | 8. | Cross Learning |
| ☐ | 9. | Other |
| | | (SPECIFY): |

6.4 In your opinion, is there a need to improve partnerships and exchanges for health educators on food security in Dadaab? (**CHECK ONE ANSWER**)

- | | |
|--------------------------|-----------------|
| ☐ | 1. Yes |
| ☐ | 2. No |
| ☐ | 3. I don't know |

6.4.1 If yes, what steps could be taken to improve partnerships and exchanges?

--

6.5 We have reached the end of our interview. Do you have any additional suggestions for health education on food security in Dadaab?

--

Thank you!

Focus Group Discussion Guide on Dynamics of Health Education on Food Security in Dadaab in Kenya.

Criteria for Selection of FGD Participants

Location: _____ Date: ____ / ____ / ____

Name of Facilitators and Note takers: _____

Group name/description: _____

No. of male participants: _____ No. of female participants: _____

Were vulnerable groups present (elderly, People with Disability, Youths etc.)? _____

FGD introduction:

Good morning/ afternoon, my name is/ are _____. We are here on behalf of Nelly Saiti who is a student at ANU in Kenya studying governance, peace and security. We are here today to discuss the dynamics of health education on food security in Dadaab.

The information provided will be used by different entities including ANU, government, UN agencies, INGOs, NGOs to improve/ strengthen/ provide health education on food security in Dadaab, review current policies, regulations, or guidelines in support of this initiative.

All ethical considerations will be observed (Voluntary participation, confidentiality, and considerations for benefits on participants over science).

(Ask for either verbal or written informed consent after reading and explaining the content of the consent form to study participants). If no, thank the participants and allow them to leave. This also applies to taking photos.

FGD QUESTIONS FOR ASSESSMENTS	
QUESTION	ANSWER
<i>This Focus Group Discussion guide aims to assess the dynamics of health education on food assistance in Dadaab. The key thematic areas in the interview guide will be drawn from three specific objectives: health education strategies on food security, the nexus between health education and food security, and barriers hindering the success of health education on food security.</i> <i>(Ask for either verbal or written informed consent after reading and explaining the content of the consent form to Focus Group Discussion participants).</i>	

1. How is health education on food security provided in this community? Is this a good way to provide health education on food security in this community? Is anyone or group missed out? If so, who? Is there a better way to share information with you? Probe for: ● Facility Based: Ministry of health- Health providers; NGO workers (Partnership Collaboration) ● Institution Based: Curriculum Integration- Schools and other institutions of learning; Training and Capacity building. ● Community Based Strategies: Community Engagement- House to house visits, Community dialogue, Community action days, focus group discussions, support groups, mass media campaign. ● Technology: Mobile Applications, Bulk SMS, social media. ● Others... Specify.	
2.How has this transformed your understanding of food security outcomes?? (Probe for food access, food availability, food utilization, food stability)	

2. What barriers hinder the successful participation by community members in health education on food security?	
3. What are the best ways to ensure community take part in these activities?	
4. What are the best approaches to share health education on food security in Dadaab? Which channels? By what languages? Are there people in the community who have difficulties accessing health education on food security? How do people share information with each other?	
5. What health education on food security would people like to receive or feel they are not getting? (Probe for food access, food availability, food access, food stability)	
6. What do you think the community can do to receive additional health education on food security that is not provided? Which groups in the community should be involved? Are there groups who would find it challenging to take part? Are there issues of concern between different groups we should be aware of?	
7. What do you think other organizations or entities can do to	

receive additional health education on food security that is not provided? (Probe for government, humanitarian organizations, community leaders e.t.c)	
8.If additional health education on food security activities is to be started, what is the best way to make sure people have a voice in what is happening and are involved in decisions making? How do people normally participate in decisions in this community? Is anyone excluded? Should we work through community leaders or with an existing committee(s)? Or set up a new committee for the project? If so, how should members be selected? What would enable people to be able to take part in these approaches? For example, would women need childcare to attend meetings?	
9.Who else is providing health education on food security in this community and should they be involved in any community related project? For example, local authorities? Other NGOs or community organizations?	
10. What suggestions would you provide to organizations providing health education on food security?	

Appendix 3: Research Permits

3.1 Letter from African Nazarene Academic and Student Affairs



P.O.Box: 53067 – 00200
Nairobi, Kenya.
Tel: 020 252 7170/1 – 5
Email: vc@anu.ac.ke
www.anu.ac.ke

23rd May 2024

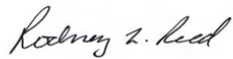
RE: TO WHOM IT MAY CONCERN

Nelly Saiti Barasa (22J01DMGP029) is a bonafide student at Africa Nazarene University. She has finished her course work and has defended her thesis proposal

entitled: -

“Dynamics of Health Education on Food Security Among the Refugees in Dadaab Refugee Camp, Kenya.”

Any assistance accorded to her to facilitate data collection and finish her thesis is highly welcomed.



Prof. Rodney Reed
Deputy Vice Chancellor, Academic & Student Affairs

3.2 NACOSTI Research Permit

 REPUBLIC OF KENYA	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Ref No: 422017	Date of Issue: 31/May/2024
RESEARCH LICENSE	
	
This is to Certify that Ms. Nelly Saiti Barasa of Africa Nazarene University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Garissa on the topic: DYNAMICS OF HEALTH EDUCATION ON FOOD SECURITY AMONG THE REFUGEES IN DADAAB REFUGEE CAMP, KENYA for the period ending : 31/May/2025.	
License No: NACOSTI/P/24/36434	
Applicant Identification Number 422017	 Director General NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Verification QR Code 	
NOTE: This is a computer generated License, To verify the authenticity of this document, Scan the QR Code using QR scanner application.	
See overleaf for conditions	

Appendix 4: Research Approvals and Letters

(i) Approval Letter from Department of Refugee Services


OFFICE OF THE PRESIDENT
MINISTRY OF INTERIOR AND NATIONAL ADMINISTRATION
STATE DEPARTMENT OF IMMIGRATION AND CITIZEN SERVICES
DEPARTMENT OF REFUGEE SERVICES

Website: www.refugeeaffairs.go.ke
email: ras.dadaab@gmail.com
Tel: + 254 02896191

Dadaab Refugee Complex
P. O. Box 62 - 70103
Dadaab, Kenya

DRS/DDB/1/4/17

18th June, 2024

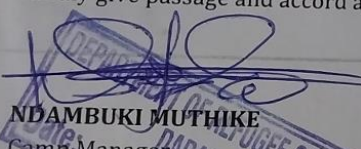
RE: PERMISSION TO VISIT DADAAB REFUGEE CAMPS

Permission has been granted to the below individuals to visit Refugee Camp from **13th June to 30th August 2024**.

S.N	NAME	NATIONALITY	ID/PASSPORT NO
1	NELLY SAITI BARASA	KENYAN	24637116

The purpose of the visit is to *do a research for "Dynamics of Health Education on Food Security Among the Refugees in Dadaab Refugee Camp, Kenya,"*

Kindly give passage and accord assistance.


NDAMBUKI MUTHIKE
Camp Manager
Dadaab Refugee Complex



(ii) **Approval email from UNHCR Head of Operations in Dadaab**

Request for approval to conduct research in Dadaab



Nelly Saiti <saitinambo@gmail.com>

to ejalu

Mon, Jun 3, 2024, 1:25 PM



Dear Ejalu,

My name is Nelly Saiti currently working with a humanitarian organization in Dadaab. Am also a student at African Nazarene University.

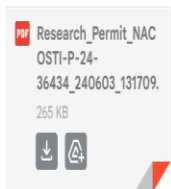
I write to request for your support to acquire approval to conduct my research in Dadaab targeting refugees as part of a requirement for completion of the course. Attached please find research permit from NACOSTI. I also have a letter from the university board that I could avail in your office if needed.

I look forward to hearing from you.

Kind regards,

Nelly.

One attachment • Scanned by Gmail



William Ejalu <ejalu@unhcr.org>

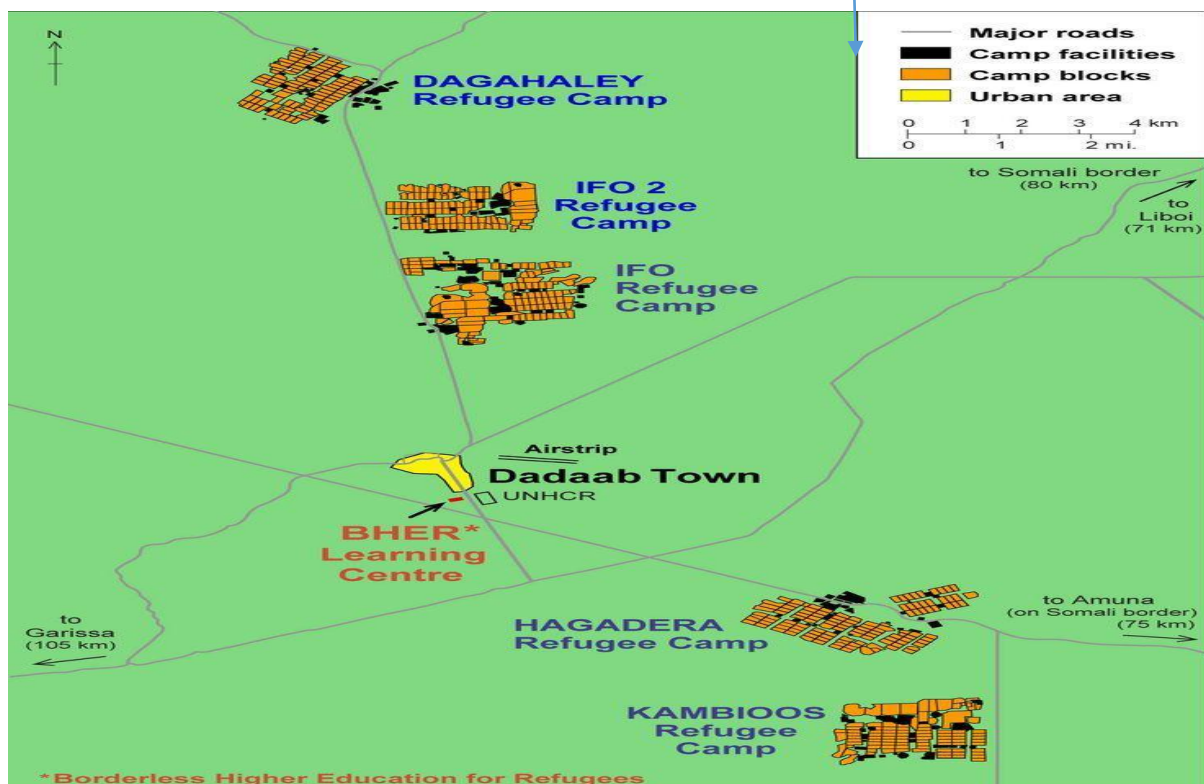
to me

Mon, Jun 3, 2024, 8:20 PM



Approved

Appendix 5: Map of Study Area



Appendix 6: Budget

Budget Items	Description	Unit	Unit Cost	Qty	Total Cost
Activity Stationaries	Printing Papers; Pens e.t.c	Once	4000	1	4000
Research Enumerators @5 days for 20 Pax= Kes 1000 per person per day	Incentive Payment or wages	Days	20,000	5	1000,000
Data entry @2 Pax for 3 days= Kes 2000 per person per day	Payment for data clerks	Days	4000	3	12000
Refreshments (Kes 100 per enumerator per day for 5 days)	Water, Snacks and soft drink	Pax	500	20	3000
Training	Conference Package	Pax	1500	20	30,000
Printing of books	Final Printed Thesis	Pcs	300	10	30000
Total (Kes)					153,000

Appendix 7: Work Plan

Work Plan							
Activities	Jan-23	Feb-24	Mar-24	Apri-24 to 25	May-25	May-25	Jun-25
Concept development							
Proposal Writing							
Proposal Presentation							
Ethical Review and Clearance							
Data Collection							
Data Analysis							
Report Writing							
Presentation of findings							
Publication of findings							
Graduation							