Healthcare Workers' Perceptions on Dietary Counselling and the Inclusion of a Food Atlas in Dietary Counselling

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Laurea University of Applied Sciences **Abstract**

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The aim of this thesis was to understand the role of dietary counselling in reducing the double burden of malnutrition in women of reproductive age and young children aged 6-23 months in Kenya. The main objective was to explore dietary counselling and its provision to both women and young children. The second objective was to explore how a photographic food atlas may be included in dietary counselling. Recommendations on how these objectives may be achieved were presented. The thesis was completed in collaboration with the InnoFood Africa project in Kenya.

A qualitative approach was applied in this study. Thematic interviews with open ended questions were used to collect data from healthcare workers working in Kahawa West public health center in Nairobi, Kenya. Healthcare workers' perceptions on dietary counselling and the inclusion of a photographic food atlas in dietary counselling were explored. Six healthcare workers participated in the study. Thematic analysis was applied and an inductive approach used to develop themes.

The results were organized into four themes including nutritional knowledge and support, inclusion of a photographic food atlas in dietary counselling, challenges to provision and uptake of dietary counselling and driving factors to provision and uptake of dietary counselling. The study findings indicated the importance of dietary counselling in creating awareness on nutrition, offering guidance on proper dietary habits and minimizing disease risks. The photographic food atlas may be used as a reference aid and a guide to food portion sizing during dietary counselling. Perceived challenges in the provision and uptake of dietary counselling included shortages in resources, cultural and external factors. Training of all cadres, income generating activities, delivery methods and provision of incentives were perceived as the driving factors to the provision and uptake of dietary counselling.

In conclusion, dietary counselling was perceived as vital in improving the nutritional status of women of reproductive age and young children in the Kahawa West region. There was a general perception among all informants that the photographic food atlas would be a beneficial additional tool during provision of dietary counselling. Further research on the extent to which a photographic food atlas may motivate women and young children to modify their dietary habits in the management of nutrition-related diseases including diabetes, stroke, specific cancers and heart diseases may be important. Additionally, research evaluating the benefits of providing dietary counselling using a photographic food atlas may be beneficial in improving nutrition counselling services in the region.

Keywords: Malnutrition, women of reproductive age, young children, dietary counselling, food atlas

Contents

1 Introduction

Malnutrition has been an area of focus in different parts of the world. At global levels, almost one in three persons suffers from one or more forms of malnutrition (World Health Organization 2021). The World Health Organization (2017) defines malnutrition as excesses, deficiencies or imbalances in an individual's nutrient and or energy consumption levels. Additionally, malnutrition has been classified into the following categories.

1. Undernutrition which includes wasting, stunting and underweight.
2. Obesity, overweight and non-communicable diseases related to diet including stroke, cancers, diabetes and heart disease.
3. Micronutrient-related malnutrition including micronutrient deficiencies, inadequate vitamins and minerals or an excess of micronutrients.

Recent studies have increased awareness on the existence of a double burden of malnutrition, especially in the low-and-middle-income countries (Popkin, Corvalan & Grummer-Strawn 2020). This double burden of malnutrition is defined as the co-existence of undernutrition together with overnutrition (obesity and overweight), and dietary-related non-communicable diseases. This co-existence of different malnutrition forms may occur within individuals, households or populations during the course of life. At the individual level, a person may suffer from two forms of malnutrition whereas at the household level, members of the same household may suffer from different forms of malnutrition during life's course. At the population or regional level, different forms of malnutrition may exist within the same community. (World Health Organization 2017; Fongar, Gödecke & Qaim 2019.)

Kenya is among the many lower-middle-income countries in sub-Saharan Africa undergoing rapid development and urbanization. Previous studies completed in different parts of the country, have described the existence of a double burden of malnutrition in both rural and urban areas and within individuals and households (Masibo, Buluku, Menya & Malit 2013; Fongar et al. 2019; Takeuchi et al. 2021; Masibo, Humwa & Macharia 2020).

Kimani-Murage, Muthuri, Oti, Mutua, van de Vijver and Kyobutungi (2015) investigated the co-existence of over- and undernutrition in adults and children at the neighborhood and household level in two poor urban settings in Nairobi Kenya. Their study concluded that the double burden of malnutrition was present in the urban slums of Korogocho and Viwandani, with stunting occurring during early life and overweight occurring during adult life, and especially in women.

The Global Nutrition Report (2018) showed evidence of dietary intake habits contributing to different forms of malnutrition. The report emphasized on the importance of improving dietary intake practices to end all forms of malnutrition, starting from the local primary healthcare service sectors. Reardon et al. (2021) linked the consumption of ultra-processed foods to the increase of a double burden of malnutrition in sub-Saharan African countries. Furthermore, Kimani-Murage et al. (2015) concluded that a distinct transition in dietary patterns, declining physical activity, inadequate access to good food choices, inadequate access to primary healthcare services and other socioeconomic and sociodemographic factors contributed to a rise in the double burden of malnutrition occurrence in Kenya.

Eliminating malnutrition in all its forms is an essential component according to the second United Nations Sustainable Development Goals. The second goal which targets ending all forms of malnutrition by 2030 includes achieving the set objectives of reducing wasting, stunting in children, and improving nutritional requirements of women of reproductive age and the elderly (United Nations 2015). Improving the nutritional status of young children and women of reproductive age should be addressed at the local level especially during the provision of basic primary healthcare services. Furthermore, provision of nutrition information to the community is crucial to improving the nutritional status of those at risk of suffering from different forms of malnutrition.

This thesis was implemented in association with the InnoFood Africa research project in which the University of Helsinki formed part of a consortium aiming to improve healthy dietary habits of communities, through the development of food-based dietary guidelines that can be locally adaptable to urban environments in Kenya, among other countries. The InnoFood Africa project received funding from the European Union's Horizon 2020 research and innovation programme (InnoFood Africa 2020).

2 Nutrition transition

Nutrition transition has been defined as a combination of reduced physical body activity and an improved food access. This transition is identified as a prevailing risk factor for increased overweight and chronic metabolic diseases prevalence in developing countries. Bhurosy and Jeewon (2014) define nutrition transition as a shift or modification in the content of diets, often combined with modifications in the levels of physical activity.

Bodirsky et al. (2020) defined nutrition transition as dietary pattern shifts from rare, fresh and unprocessed plant-based foods to wealthy highly processed dietary products, rich in fat, sugar and animal-source products. Nutrition transition has triggered a shift in public health dilemmas from diseases and disorders related to undernutrition including neonatal disorders

and infectious diseases, towards overnutrition-related chronic non-communicable diseases such as diabetes, stroke, cancers and heart diseases.

Urban population's dietary intake habits and dietary choices are also rapidly changing, affecting the quality of food and hence contributing to the double burden of malnutrition (World Bank 2012). Kenya's rapid development and urbanization has also contributed to a nutrition transition, involving dietary shifts from nutrient-dense foods to more processed or overprocessed foods (Walls, Johnston, Mazalale & Chirwa 2018). This nutrition transition has led to the co-existence of both under- and overnutrition within similar areas. Kosaka and Umezaki (2017) described the nutrition shift as moving away from diets based on vegetables, fruits and staple grains which are locally available, to diets higher in sugars, fat, animal-origin foods and cheaper overprocessed foods low in fibre.

Popkin et al.(2020) also stated that an increased consumption of processed, packaged foods rich in refined sugar, fat, carbohydrates and salt are comparatively cheap and usually ready to eat, hence replacing nutrient and energy dense foods. This exacerbates the occurrence of a double burden of malnutrition, especially diet related non-communicable diseases.

The Kenya National Nutrition Plan 2018–2022 (2018), describes food insecurity as a major underlying cause of malnutrition in Kenya, which entails the accessibility, economic availability and utilization of food, the environment, healthcare services accessibility and usage and practices involving food consumption and care at different levels. Food insecurity may contribute to the nutrition transition especially due to economic difficulties. At the primary level, malnutrition is caused by inadequate levels of knowledge and poor governance and distribution of resources to all sectors. Figure 1 shows a modified framework representing the different factors contributing to the double burden of malnutrition as depicted by the current Kenya National Nutrition Action Plan 2018-2022 report.

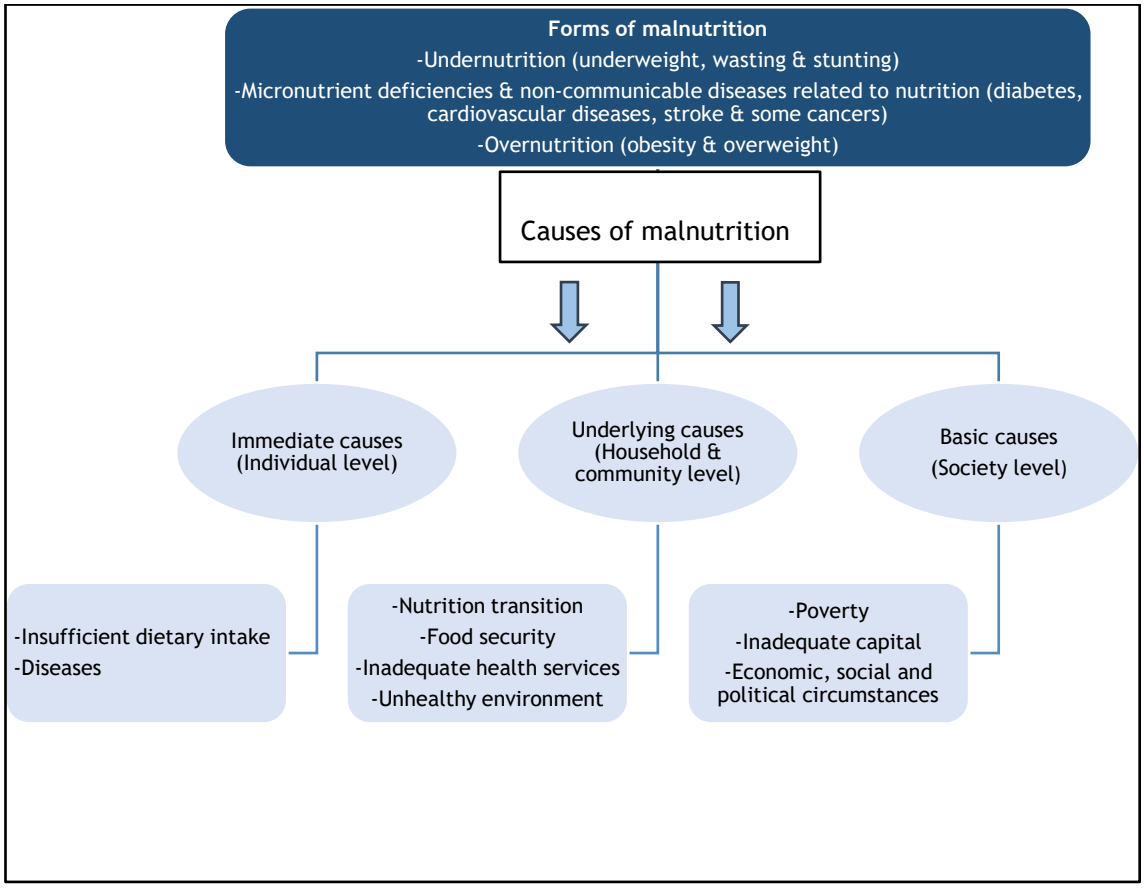

Figure 1: Types of malnutrition and contributing factors (Kenya National Action Plan 2018-2022 2018)

The rising prevalence of overnutrition in Africa has contributed to the accelerated increase in non-communicable diseases including cardiovascular diseases, diabetes, cancers and respiratory diseases (Akokuwebe & Idemudia 2021). A combination of factors including inadequate dietary intake following food unavailability or poor feeding practices, poor sanitation, illness and underlying social and economic conditions have contributed to poor dietary feeding practices in different age groups. This contributes to an increase in malnutrition in all its forms in women. (Acharya, Bhatta & Timilsina 2017.)

Poverty especially in many sub-Saharan countries also has a major effect on the diet quality of women of reproductive age and young children. Moreover, nutritional requirements of women of reproductive age are increased due heavy workload, inadequate nutritional knowledge and short, frequent reproductive cycles with regular pregnancies depleting the body's nutrient reserves. All these factors contribute to inadequate nutrition among women. (Riang'a, Nangulu & Broerse 2020.)

3 Dietary recommendations and current nutritional status

Malnutrition among low-income populations is induced by the daily repetitive and excessive intake of starch staples, reduced intake of vegetables and fruits and insufficient intake of animal-source foods (Kaliwile et al. 2019). A study by M'bobda et al. (2020) in Cameroon concluded that most women of reproductive age frequently consumed food groups rich in carbohydrates, oils and fats with a low consumption of food groups rich in proteins, minerals and vitamins. Young children aged 6-23 months are usually fed on the same foods as their mothers or caregivers, resulting in almost similar nutritional deficiencies in both mother and child.

According to the Kenyan dietary guidelines by the Ministry of Health Kenya (2017), foods with similar nutritive value and bodily functions are grouped into the same categories. These form the different food groups (see Figure 2). The Kenyan dietary guidelines recommend eight different food groups for all age groups to guide policy makers and professionals in providing nutrition education in Kenya.

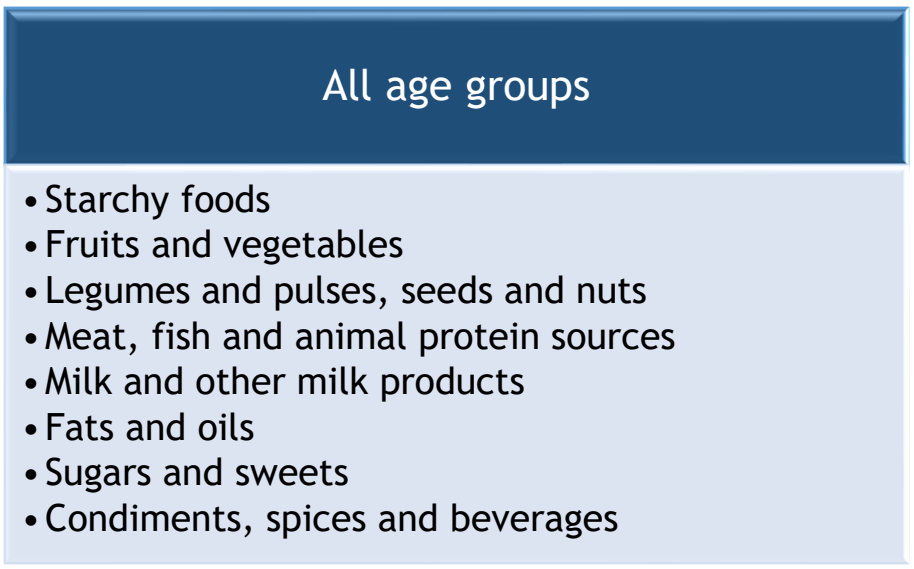

Figure 2: Recommended food groups for all age groups (Ministry of Health Kenya 2017)

3.1 Dietary recommendations for young children (6-23 months)

The Kenyan Ministry of Health (2020) nutrition guidelines provide dietary recommendations for infants and young children in Kenya. Eight food groups are mentioned for young children aged between 6-23 months. In comparison to the previous Ministry of Health Kenya 2017 guidelines, other vegetables and other fruits have been included in the current dietary intake guidelines.

Exclusive breastfeeding is recommended for all children for the first six months of life. Continued breastfeeding combined with suitable complementary feeding is also recommended for young children aged 6-23 months and older. The World Health Organization and United Nations International Children's Emergency Fund (2021) and the World Health Organization (2017) infant and young feeding practices guidelines also advocate for continued breastfeeding of young children for two years or more.

The daily dietary recommendations for young children should contain foods from a minimum of four food groups (Ministry of Health Kenya 2020). Similarly, the World Health Organization and the United Nations International Children's Emergency Fund (2021) provide the same dietary recommendations regarding young children feeding practices. The consumption of solid and semi-solid foods depending on the child's age and consumption of a variety of foods such as vegetables, cereals and fruits is important in preventing malnutrition in all its forms. Figure 3 shows the different food groups according to Kenya's Ministry of Health recommendations (2020).

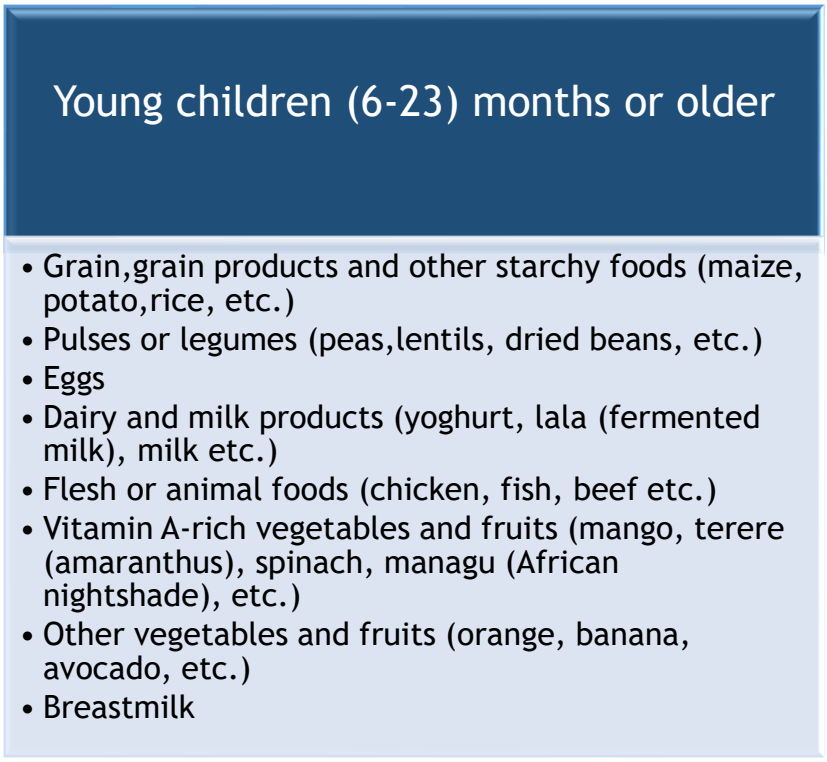

Figure 3: Recommended food groups for young children (Ministry of Health Kenya 2020)

In children within the age group of 6-23 months, continued breastfeeding may prevent almost half of morbidities and mortalities, diminish risks of overweight and obesity and reduce risks of some maternal diseases including diabetes, ovarian and breast cancers. About 57% of respiratory infections and 72% of diarrheal infections in young children may be prevented

through breastfeeding. Additionally, a 35% incidence reduction in diabetes and a decrease of 13% in the prevalence of overweight and obesity are all associated with optimal breastfeeding practices. (Kenya National Nutrition Plan 2018–2022 2018.) Breastmilk plays a crucial role in the provision of required nutrients, fluids and immunological support. In the Kenyan 2014 demographic health survey which included the assessment of feeding and care practices for young children, it was concluded that about 61% of Kenyan children were exclusively breastfed (Kenya Bureau of Statistics 2015).

The World Health Organization (2017) recommends the introduction of complementary foods (soft, solid and semi-solid foods) at six months of age, as the child continues to breastfeed. In the demographic health survey carried out in Kenya in 2014, 92% of breastfed children and 97% of non-breastfed children aged between 6-23 months in Kenya had been introduced to complementary diets, including both solid and semi-solid foods (Kenya Bureau of Statistics 2015).

In majority of the developing countries, complementary diets for children consist of cereal-based foods, which are highly deficient in energy and nutrients especially vitamins B, vitamin C, vitamin A, iron, calcium and zinc. Young children are therefore exposed to nutritional deficiencies as they grow. (World Health Organization 2017.) According to the Kenya Bureau of Statistics (2015), most common complementary foods introduced to children aged between 6-23 months include foods from grains, vegetables rich in vitamin A and fruits, foods from roots and tubers and other vegetables and fruits. Other common complementary foods include protein-rich foods including legumes, nuts, poultry, fish, eggs, meat, yoghurt , other milk products and cheese. Fortified baby foods, infant formular and liquids including clear broth, juice and milk ,other than breastmilk, are also introduced as complementary feeds.

A number of studies in Kenya have suggested that the most common complementary feeds introduced to young children aged between 6-23 months in the country include foods generally prepared from grains, roots and tubers such as rice, porridge, ugali, chapati, potatoes, bread, cassavas and yams (Kimwele & Ochola 2017), porridge (Makau, Ochola & David-Kigaru 2017), and cereal-based gruel (Onyango, Receveur & Esrey 2002). Similar studies in other developing countries have reported complementary feeds as consisting mainly of unfortified cereal-based gruel which lacks nutrient density and energy (Teshome, Whiting, Green, Demelash & Henry 2020).

In some cases, complementary feeding incurs some challenges as caregivers may not have adequate knowledge on suitable dietary options and food preparation methods. Furthermore, inadequate funds to buy required foods, scarcity in time to prepare foods and certain cultural beliefs and restrictions contribute additional challenges to many caregivers in developing

countries. Consequently, the risk of malnutrition in both the mother and the child is escalated. (Ministry of Health Kenya 2017, 23.)

Various nutritional indicators for evaluating the dietary practices of young children aged 6-23 months have been established, providing guidelines on dietary requirements for children to ensure optimal growth and development. Different indicators (see Figure 4) are used in assessing the dietary intake habits of young children.

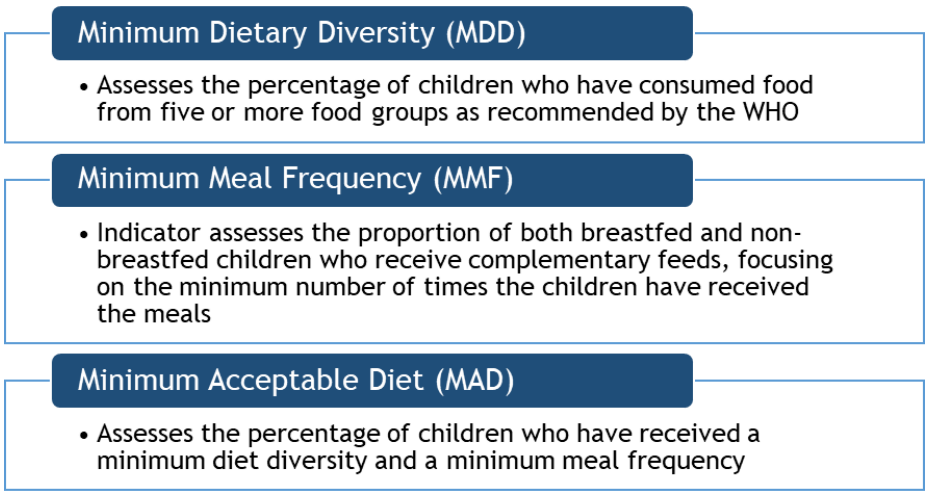

Figure 4: Nutrition indicators for assessing young children's dietary practices (World Health Organization 2022b)

According to the Food Systems Dashboard (2021), young children aged 6-23 months in Kenya have a minimum dietary diversity of 36% which is relatively higher in comparison to the global estimate of 29%, and a minimum meal frequency of 51% compared to 53% in the rest of the world. According to the Kenya Bureau of Statistics (2015), only 22% of breastfed children aged between 6-23 months in Kenya have consumed the minimum diet recommended after introduction of complementary feeding.

The guidelines on infant and young child feeding practices suggest that dietary consumption for this age group should consist of foods from the eight different food groups to increase growth and reduce risks of micronutrient deficiencies. Breastfed children between 6-23 months are required to receive a minimum meal frequency of 3-4 times a day and an additional nutritional snack 1-2 times a day. The recommended minimum meal frequency for non-breastfed children is 4-5 times a day (World Health Organization and United Nations International Children’s Emergency Fund 2021). Major consideration should be accorded to the quality of diets for young children due to the demanding nature of their growth and development requirements (Kenya National Nutrition Plan 2018-2022 2018).

3.2 Dietary recommendations for women of reproductive age (15-49 years)

In Kenya, the population of women between the ages of 15 to 49 years are referred to women of reproductive age. The current population of women of reproductive age in Kenya stands at about 14,879 (World Health Organization 2022a).The World Health Organization (2017) states that malnutrition is among the most significant health problems especially among women of reproductive age in many developing countries worldwide. Women in this age group require additional nutritional requirements due to monthly blood loss, pregnancy and lactation (Kenya Bureau of Statistics 2015). Moreover, malnutrition during pregnancy such as overweight or excessive weight gain may increase the risk of childhood malnutrition including childhood obesity (World Health Organization 2017).

In many countries including Kenya, women's diets contain limited vegetables, meat, fish, dairy and fruits. Moreover, pregnant women consume diets with insufficient nutrients including iodine, folate, iron, zinc and calcium, leading to health problems and nutrition-related conditions in children. (United Nations International Children's Emergency Fund 2022.)

Additionally, Harika, Faber, Samuel, Kimiywe, Mulugeta and Eilander (2017) suggest that the most prevalent micronutrient deficiencies in women include vitamin A, iron, folate, zinc and iodine. Insufficiency of important nutritional requirements may result in poor nutritional status of mother and developmental problems for infants especially during the first two years of life. Important macro- and micro-nutrient deficiencies including protein, fatty acids, iron, zinc and iodine are usually persistent in countries with low incomes and food insecurities as well as those with high incomes.

Sufficient micronutrient intake among women of reproductive age is of crucial importance for both women, including mothers and their children, providing protection from certain conditions which may hinder the growth and development of their offspring (Kenya Bureau of Statistics 2015). Women are the principal caregivers and greatly influence the wellbeing of their children and families (Acharya et al. 2017). Women of reproductive age are described as being susceptible to nutritional deficiencies such as micronutrient deficiencies due to challenges such as insufficient dietary consumption, inequitable food distribution within households, inadequate food availability, frequent incidence of infectious illnesses and inadequacy in knowledge of the significance of dietary diversity.

The Ministry of Health Kenya (2020) nutrition guidelines provide dietary recommendations for women including pregnant and breastfeeding mothers. According to the ministry's recommendations, a healthy diet for pregnant and breastfeeding women constitutes the daily consumption of a minimum of five out of the ten food groups. Additionally, small extra meals in addition to normal meals are recommended for both pregnant and breastfeeding women.

Figure 5 illustrates the ten different food groups recommended for women of reproductive age in Kenya.

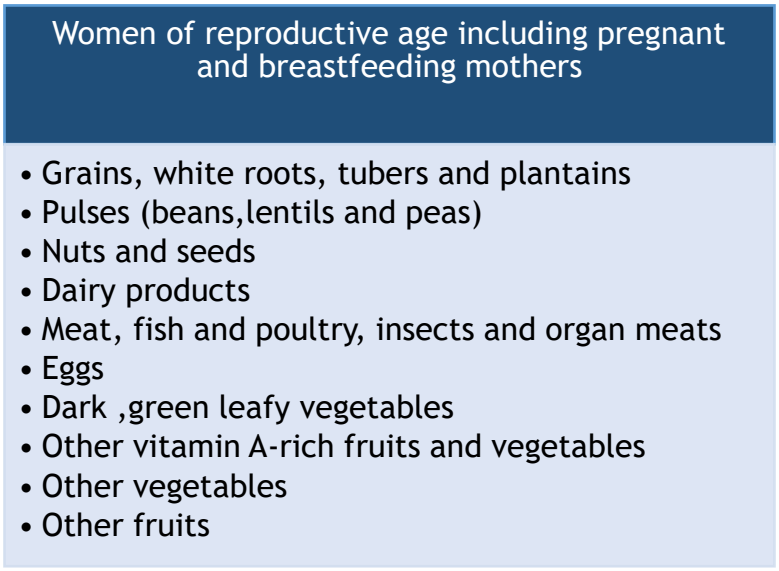

Figure 5: Recommended food groups for women of reproductive age (Ministry of Health Kenya 2020; Food and Agriculture Organization of the United Nations 2021, 5-6)

3.3 Nutrition status of young children 6-23 months

Young children between the ages of 6-23 months are considered vulnerable to malnutrition in all its forms. This growth phase is considered the window of opportunity for ensuring proper growth and development through optimal dietary practices to prevent the risks of malnutrition. Nsiah-Asamoah, Pereko and Intiful (2019) state that young children are at a heightened risk of becoming malnourished and suffering from the negative effects of malnutrition.

Globally, one in five children under five years of age suffers from some form or degree of malnutrition. About one in three children under five years of age suffers from undernutrition or overweight. Additionally, over 340 million children under five years of age worldwide are suffering from micronutrient deficiencies whereas more than 200 million children under five have been classified as stunted or wasted. In 2020, the global prevalence rates of stunting, wasting and overweight in children under the age of five years was 30.7%, 6% and 5.3% consecutively. (Global Nutrition Report 2022b.)

The prevalence of both undernutrition and overnutrition in children is present and rapidly increasing in the world. About 44% of young children aged 6-23mths worldwide consume complementary diets containing inadequate amounts of fruits and vegetables. Furthermore, another 59% of children within this age group are not fed on eggs, fish, meat or dairy. (United

Nations International Children's Emergency Fund 2019.) In Africa, Sub-Saharan Africa has the highest number of children under five years of age affected by stunting, about 150 million children, and wasting, about 50 million children (Jardi, Casanova & Arija 2021).

In Kenya, about 4% of children under the age of five are wasted, 4% are overweight, 11% are underweight and 26% are stunted. Additionally, micronutrient deficiencies in children aged 6-59 months in Kenya include iron deficiency, anemia and iron deficiency anemia, with prevalence of 21.8%, 26.3% and 13.3% respectively. (Kenya Bureau of Statistics 2015, 157.) Figure 6 shows the different prevalence rates of malnutrition among young children in Kenya.

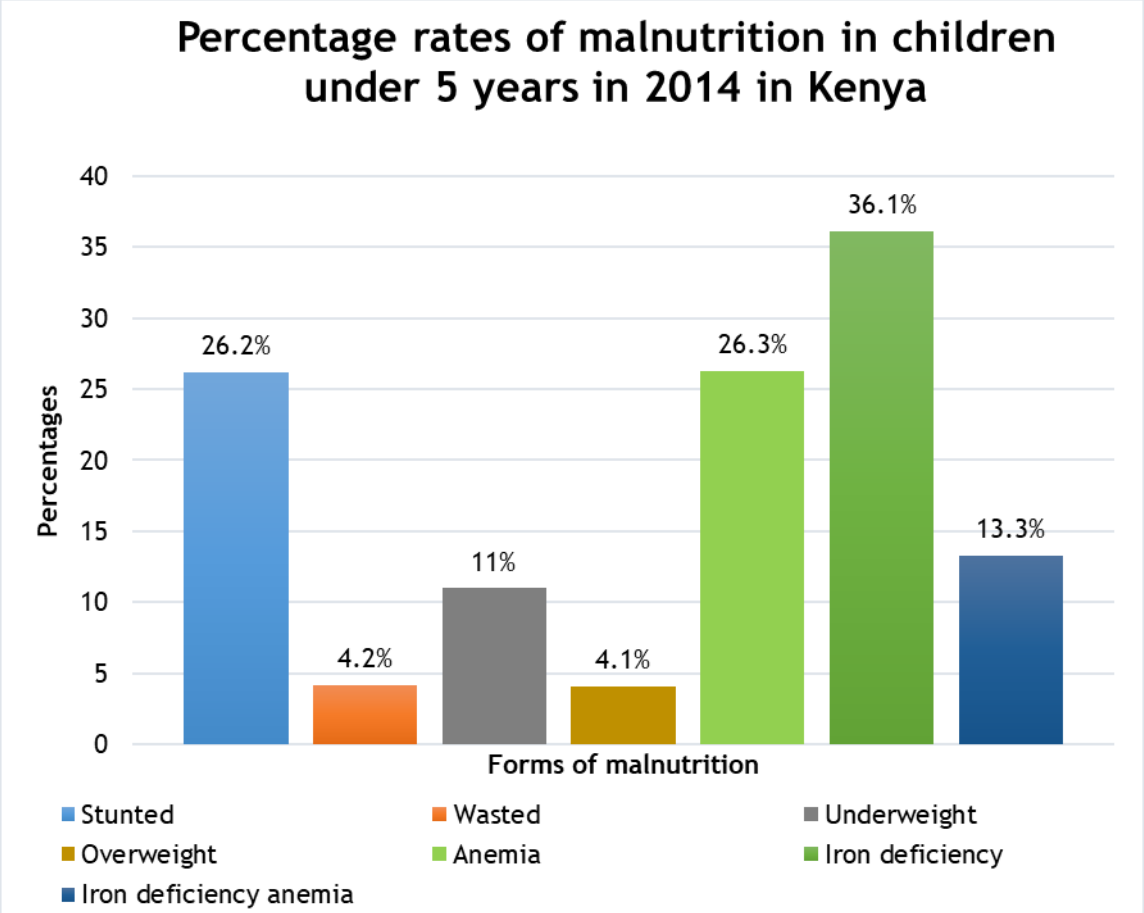

Figure 6: Rates of malnutrition in children under 5 years in Kenya (Global Nutrition Report 2022a; Kenya Bureau of Statistics 2015, 2)

The period between 6-24 months of age is the most crucial in the growth and development process of young children. During this period of growth, the risk of developing malnutrition is increased. Considerations are important in ensuring the quality of complementary diets for young children especially due to the increase in demand for nutrients for optimal growth. (Okoth, Ochola, Gikonyo & Makokha 2016.)

Young children aged 1-3 years usually consume a diet identical to that of their parents, resulting in increased susceptibility to poor dietary habits. Food insecurities have contributed to this phenomenon, whereby food quantity substitutes food quality. Nutritional transitions to cereal-grain-based diets have also contributed to nutritional insufficiencies and poor growth in children between 1-3 years especially in the low-and middle-income countries (Cusick & Georgieff 2016).

3.4 Nutrition status of women of reproductive age

Women of reproductive age are at an increased risk of suffering from different forms of malnutrition (see Figure 7). Women are often responsible for food selection, preparation and feeding of young children. Furthermore, women are described as being nutritionally vulnerable due to the physiological demands of the body for example during pregnancy, and lactation whereby the body requires additional nutrients (Food and Agriculture Organization of the United Nations 2021, 11).

Women are the major caregivers for families and children. However, Mtumwa, Paul and Vuai (2016) suggest that mothers tend to neglect their own health, increasing the risk of suffering from malnutrition. Maternal dietary intake greatly influences young children's diet and the diet of other family members. Therefore, improving the diet of women may improve the dietary intake of the whole family (Waswa, Jordan, Krawinkel & Keding 2021).

Globally, about 120 million women in the developing countries are underweight (Acharya et al. 2017). Additionally, about 264 million women of reproductive age are affected by iron-amenable anemia worldwide (World Health Organization 2017). In Africa, it is estimated that about 40.2% of all women of reproductive age are affected by anemia.

The prevalence of anemia in Kenya is about 28.7% among all women of reproductive age, 27.9% among non-pregnant women and a high 40.3% among pregnant women (Global Nutrition Report 2022a; Ministry of Health 2015b; Ministry of Health 2017, 2).The prevalence of micronutrient deficiencies in pregnant women is also high, with anemia being at 41%, iron deficiency at 36.1% and iron deficiency anemia at 26% (Kenya Bureau of Statistics 2015, 180 ; Ministry of Health 2015b).

The occurrence of overweight and obesity is also higher among women of reproductive age compared to men (Global Nutrition Report 2022a). Among women of reproductive age, the prevalence of overweight and obesity is increasing, especially in the low-and-middle income countries (Yiga, Ogwok, Achieng, Auma, Seghers & Matthys 2021). In Kenya, about 10% of women of reproductive age are underweight.

Young women residing in the rural areas of Kenya tend to be thin compared to those residing in the urban areas. Nairobi county records the lowest proportions of thin women in the country (3%), whereas the Northeastern area records the highest rates of thin women in the country (29%). Additionally, about 33% of women of reproductive age in Kenya are either overweight or obese. Women in rural areas have a lower proportion of overweight and obesity (26%) compared to women residing in the urban regions of the country (43%). (Kenya Bureau of Statistics 2015.)

Although Kenya is on track to achieving the global nutrition targets of reducing childhood stunting, wasting and overweight, little or no progress has been achieved in reducing overweight, obesity and diet related non-communicable diseases in adults.

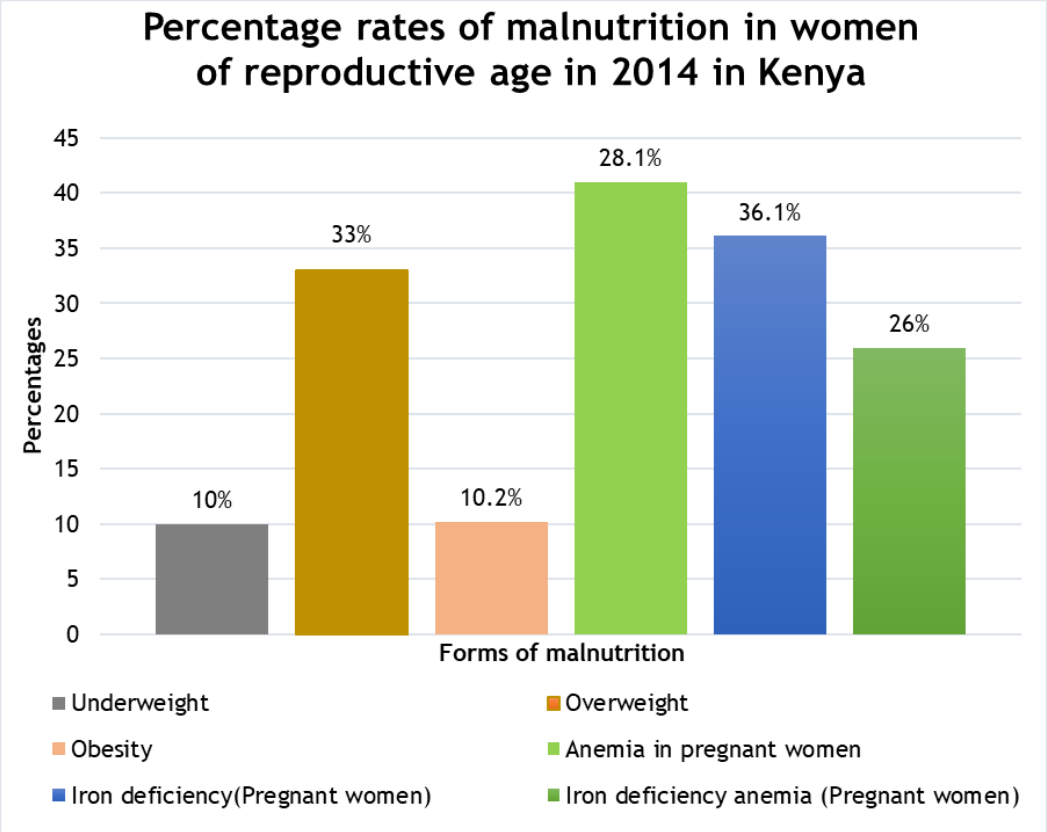

Figure 7: Rates of malnutrition in women of reproductive age in Kenya (Global Nutrition Report 2022a; Kenya Bureau of Statistics 2015)

Yiga et al. (2020) mention that by the year 2030, the prevalence of non-communicable diseases will be higher than that of infectious diseases in sub-Saharan Africa region. Furthermore, overweight and obesity are characterized as the key determinants of non-communicable diseases in women. The prevalence of diet related non-communicable diseases such as hypertension and diabetes is on the rise with 26.7% of women of reproductive age being hypertensive in 2015 and 6.2% being diabetic in 2014 (Global Nutrition Report 2018).

Moreover, the rising rates of obesity, undernutrition and consumption of poor quality diets contribute to the high rates of non-communicable diseases (United Nations System Standing Committee on Nutrition 2018).

A woman's nutritional status has vital significance not only for her health but also for her children's health (Kenya Bureau of Statistics 2015,157). Poor maternal nutrition, indicated by a low body mass index (BMI), stunting and micronutrient deficiencies, raise the risks of fetal growth restrictions, difficult labor and maternal and child mortalities (Kaliwile et al. 2019).

4 Dietary counselling

Several definitions exist for the term dietary counselling. In different studies related to nutritional status of women of reproductive age and young children, the terms nutrition counselling and nutrition education have been utilized to explain the provision or exchange of nutritional information between healthcare providers and healthcare receivers.

The terms counselling, information and education have been interchangeably used in different literature. However, counselling is considered as a process of interaction between a healthcare provider and a mother whereby information is exchanged and guidance provided to enable and motivate the mother into modifying and improving their dietary habits (United Nations Children's Fund 2021).

Nutrition counselling has been defined as a two-way communication process usually between a healthcare expert and a client aiming to understand the outcome of the client's nutrition evaluation, identify key nutritional issues, requirements and objectives, discuss steps to undertake to solve these nutritional issues, and work on ways to monitor set objectives to ensure a healthy nutritional status is sustained (Vasiloglou, Fletcher & Poulia 2019).

The Food and Nutrition Technical Assistance III Project (2016) define nutrition counselling as a two-way interaction between a client and a trained health counselor, whereby the outcome of a nutritional assessment is interpreted, individual nutritional needs and goals established, approaches to achieve these goals discussed and future actions scheduled. Nutritional counselling promotes understanding of crucial individual nutritional needs and suggests practical actions to address these needs and modify nutritional behavior. Counselling is usually provided by nurses, other facility healthcare providers, community health workers or community health volunteers.

Another definition provided by United Nations Programme on HIV and AIDS (2014) states that nutrition counselling includes nutrition education which is usually provided to groups or to individuals as individualized counselling. It is defined as a supportive and collaborative

relationship process between a client and a health worker, whereby priorities are established, goals are determined and individualized action plans are set. This type of counselling is presented to individuals or groups with the intention of modifying or promoting specific nutritional behaviors. Kuchenbecker, Reinbott, Mtimuni, Krawinkel and Jordan (2017) portrayed nutrition counselling as an approach aiding people to adjust or voluntarily modify unhealthy dietary behavior and food choices to more favorable habits which promote good health and general well-being.

Nutrition education has been defined as a combination of various educational strategies supplemented by support from the environment which promotes the voluntary adaptation of dietary preferences and dietary related habits favorable for good health and wellbeing (Pem & Jeewon 2015).

Another definition provided by the Food and Nutrition Technical Assistance III Project (2016) describes nutrition education as an introduction to general information about nutrition and health usually to groups in clinic waiting areas or in the community context (s). The information provided, usually by health volunteers or trained counselors, is usually prepared in advance, topic specific and often provided using visual aids.

The Food and Agriculture Organization of the United Nations (2021) defines nutrition education as a combination of different educational strategies which are aimed at aiding individuals attain long-lasting progress in their diets and dietary consumption habits. Nutrition education includes learning behavior and actions to improve nutrition in addition to gaining knowledge about foods and nutrients.

According to the United Nations Programme on HIV and AIDS (2014), nutritional education is an intentional, formal process, whereby information, instruction or training is provided with the aim of maintaining or promoting the nutritional well-being of individuals, groups or populations. Furthermore, it is provided either to groups or to individuals. Murimi, Kanyi, Mupfudze, Amin, Mbogori and Aldubayan (2017) describe nutrition education as any series of learning experiences specifically intended to enhance the voluntary modification of feeding and other nutrition-related practices supporting the health and wellbeing of an individual.

This concept differs from nutrition counselling, in that information provided is already pre-planned or determined. In contrast, nutrition counselling is provided according to the client's requirements at that specific stage or phase. Information shared during nutritional counselling may range from different topics depending on the clients' requirements.

Although different studies have defined nutritional counselling in different ways, similarities exist within these definitions. Nutrition counselling is generally perceived as an approach with different phases, including identifying the nutritional problem, setting goals with the client

and seeking common and realistic solutions with the aim of assisting the client in modifying their dietary behaviors.

Nutrition education also involves teaching on topics which the healthcare workers have perceived as problematic and requiring solutions. Common aspects in the different definitions of nutrition education are that it is generally a formal, prepared learning or training, whereby information is provided by healthcare providers to clients to aid in improving their dietary habits.

The general aim of both nutrition counselling and nutrition education is to improve and or modify the dietary behavior of clients. Additionally, both approaches involve provision of information to targeted clients using different support mechanisms to aid in the success of the process. Both approaches involve the voluntary participation of clients and may be provided within the contexts of the healthcare facility. However, nutrition education has been depicted as a formal on-way approach whereby the trained healthcare provider provides already prepared information to clients. In such cases, the healthcare provider performs almost all the talking and the client acts as a passive listener. Nutrition counselling involves a more interpersonal approach whereby a client's specific problems are discussed and solved according to set goals and priorities. In this case, both the healthcare provider and the client exchange information in a balanced manner.

Nutrition counselling, motivates individuals to gain knowledge on appropriate dietary intake habits and opportunities to improve their diets. The importance of nutrition counselling in the promotion of feeding habits, dietary diversity and child growth and development has been described in different studies. (Kuchenbecker et al. 2017; Jardi et al. 2021.)

The terms dietary counselling will be used for the purpose of this thesis to explore the aspects of nutrition information provided to women of reproductive age and young children in a formal or collaborative approach, with the aim of improving and modifying their dietary intake behavior. Dietary counselling will also be used to cover both aspects of nutrition counselling and nutrition education.

Maternal knowledge and education play a major role in the development and survival of a child. Educational approaches provided to women about diet intake practices have been studied to substantially impact the nutritional status of their children (Jardi et al. 2021). Dietary counselling plans and programmes have been in use in different countries and healthcare facilities with the aim of managing malnutrition in all its forms. Additionally, many countries have introduced nutrition related policies in which the role of dietary counselling in managing malnutrition is specified. In Kenya, the Kenya National Nutrition Plan 2018-2022 (2018) provides information about the importance of nutritional information to women of reproductive age and young children in Kenya.

Dietary counselling is a recognized effective method used in increasing knowledge on healthy dietary practices of caregivers resulting in improved growth of young children (Kohli & Chadha 2017). Requirements to offer dietary counselling to mothers and caregivers especially for children under two years of age has been frequently emphasized in order to reduce the risks of malnutrition. Waswa et al. (2015) recognized the negative impacts of inappropriate complementary feeding practices and its contribution to childhood malnutrition, nutritional status and overall growth and development.

In young children, the risk of suffering from childhood malnutrition in all its forms is greatest between the ages of 6–23 months, leading to morbidity and mortality on a global scale. Inappropriate and inadequate complementary feeding practices including poor dietary diversity, decreased feeding frequencies and untimely introduction of feeds contribute to the rising risk of childhood malnutrition. Furthermore, inadequate maternal knowledge on proper dietary practices and behavior, beliefs, inadequate food availability and food insecurity have been mentioned as factors attributing to malnutrition. Nikièma et al. (2017) state that dietary counselling promotes both breastfeeding and complementary feeding practices leading to proper child growth.

Importance of dietary counselling has been documented in various studies. Mistry, Hossain and Arora (2019) state that counselling mothers on nutrition may aid in improving optimal feeding habits and reducing undernutrition in young children. Waswa et al. (2015) also state that providing knowledge to mothers or caregivers on proper feeding practices has a positive effect on growth of children. Apart from promoting healthy feeding practices and improving growth in young children, dietary counselling also improves diversity in diets (Kuchenbecker et al. 2017).

A study carried out in Western Kenya by Waswa et al. (2015) assessing the effects of nutrition dietary counselling interventions on dietary diversity and nutrition knowledge of mothers concluded that mothers who voluntarily participated in dietary counselling significantly improved the variety of complementary foods provided to their children and gained more knowledge about nutrition.

Counselling women on good dietary feeding habits and young child feeding practices may result in the improvement of dietary behavior and decrease the risks of malnutrition in both mother and child. Furthermore, alterations in the diet may have major effects on nutrition related non-communicable diseases and symptoms of other illnesses. Subsequently, nutrition counselling is considered to be the starting point in the control and management of nutrition related non-communicable diseases. (Vasiloglou et al. 2019.)

However, nutrition dietary counselling programs or activities for women of reproductive age and young children between 6-23 months in communities and health facilities during routine

contact, are generally focused on reducing undernutrition without considering the adversities of overnutrition including overweight and obesity (Jaacks, Kavle, Perry & Nyaku 2017).

Dietary counselling enables a client to understand the importance and effects of nutrition on their health status and gain knowledge on proper dietary behaviors to meet their nutritional requirements (Vasiloglou et al. 2019). Additionally, dietary counselling such as on complementary feeding practices, should be adapted to cater to the exact needs of mother-child pairs to ensure maximum effect. Counselling should be age-appropriate, offering knowledge on variety of foods the child should receive, food preparation and feeding frequency (Agbozo 2016).

Vasiloglou et al. (2019) stated that dietary counselling is often offered by dieticians, nutritionists and other health professionals including nurses, community health workers and community health volunteers. Nsiah-Asamoah et al.(2019) explored and assessed nutritional counselling skills of health workers and the information shared with mothers visiting Child Welfare Clinics in rural Ghana. According to their study, dietary counselling is usually implemented by nurses or health volunteers in the sub-Saharan Africa region. Generally, all healthcare professionals play a crucial role in educating clients on different approaches to achieving healthy lifestyles, recommended dietary habits and preventing and caring for nutrition related non- communicable diseases (Kenya National Nutrition Plan 2018-2022 2018, 14).

Community health workers and volunteers are usually involved in providing nutritional information to the community. Moreover, they provide a link between healthcare providers and the community, aiding in promoting good health in their community settings. Community health workers and volunteers are usually chosen from the community and receive some basic level training but not formal professional nursing or medicine certification. Community health workers have been identified as people who can promote positive changes in health behavior in the community. (Kohli & Chadha 2017.)

According to Vasiloglou et al. (2019) study exploring the different elements of effective and adequate nutrition dietary counselling, a client-centered approach is recognized as the most effective method of implementing dietary counselling. In this way, the healthcare worker is able to gain a deeper insight on the nutritional status, health, beliefs, attitudes and preferences of a patient therefore ensuring appropriate, focused, effective and sustainable nutrition interventions.

Considering the different forms of malnutrition is important when providing dietary advice to women in Kenya where malnutrition in all forms is on the increase. Enhancing nutrition counselling services not only improves dietary intake habits of women, but also increases

women's motivation to attend nutrition counselling, eventually preventing the different forms of malnutrition.

5 Photographic food atlas

Monitoring and assessing food consumption among women of reproductive age and young children prevents the occurrence of malnutrition in all its forms and allows for prompt action to ensure adjustments in diet. The evaluation and monitoring of dietary consumption behavior involves the utilization of different methods, tools and food portion estimation aids. These methods include obtaining dietary data from food manufacturers, using data from previously weighed food records, utilizing household measures such as measuring cups, using plastic food models and photographic food atlases. The use of a photographic food atlas as a method of estimating the amount of food consumed by an individual, group or population, has been recorded as being advantageous in comparison to these other methods. (Al Marzooqi, Burke, Al Ghazali, Duffy & Al Yousuf 2015.)

A photographic food atlas is defined as an album or collection of photographs illustrating or representing various quantities of a specific food (see Figure 8). It is usually used to define food portion sizes and is often attached together in a single volume. Food photographs display a range of food portion amounts consumed by a specific age group or population. Subjects are required to select the photograph (s) that best represents their usual or actual food portion sizes. (Jayawardena & Herath 2017.) Villena-Esponera, Rojas, Mateos-Marcos, Salazar-Donoso and Molina-Recio (2019) suggest that photographic food atlases act as visual aids, used in estimating food consumption and evaluating nutrient intake in different individuals, groups or populations.

Photographic food atlases can be tailored to specific local contexts and may be easily adapted and reproduced to illustrate a diverse range of foods. Food atlases are considered less time consuming compared to the other dietary intake assessment methods. Photographic atlases are also practical especially in low literacy contexts. Moreover, they are recognized as culturally appropriate (Harris-Fry et al. 2016).

The utilization of food photographs displaying different diverse and locally available foods allows for increased accuracy in estimating the amount or quantity of food consumed by an individual (Ali, Platat, El Mesmoudi, El Sadig & Tewfik 2018). Although different visual aids may be utilized to assist in estimating the amount of foods consumed, the photographic food atlas is viewed as a feasible method as photographs of any necessary food portions may be produced and conveniently transported by health workers and researchers depending on requirements (Jayawardena & Herath 2017).

Food atlases have been applied in the field of nutrition research, in the assessment of dietary intake of individuals or populations. The photographic food atlas is regarded as an important tool in dietary recall situations, aiding in studying food habits (Ali, Platat, El Mesmoudi, El Sadig & Tewfik 2018). Ferreira et al. (2021) also describe photographic food atlases as important tools aiding in estimating dietary consumption or amount of food consumed, thus allowing for increased accuracy in measuring food consumed within different communities or populations.

In comparison to other food portion size estimation methods, photographic food atlases have been described as useful and have been validated in several countries. Studies detailing the development, validation and accuracy of food photographs as food portion estimation aids in research and nutrition education include studies in Sri Lanka (Jayawardena and Herath 2017), Lebanon (Tueni, Mounayar and Birlouez-Aragon 2012), United Arab Emirates (Al Marzooqi et al. 2015), Nepal (Harris-Fry et al. 2016), Kenya (Walsh 2020), Malawi (Flax et al. 2019, Tunisia (Bouchoucha et al. 2016) and Finland (Nissinen et al. 2018).

A doctoral study completed in Kenya in 2018 described the development of the first photographic food atlas in the country. The food atlas, developed as an aid in assessing the standard food portion sizes of Kenyan adolescents in an urban setting includes common and locally consumed Kenyan foods based on information collected in Nairobi County. Food names are presented in both English and Swahili language, allowing for broader utilization when collecting information on dietary consumption. The developed atlas contains about 88 of the most locally and commonly foods (Walsh 2020).

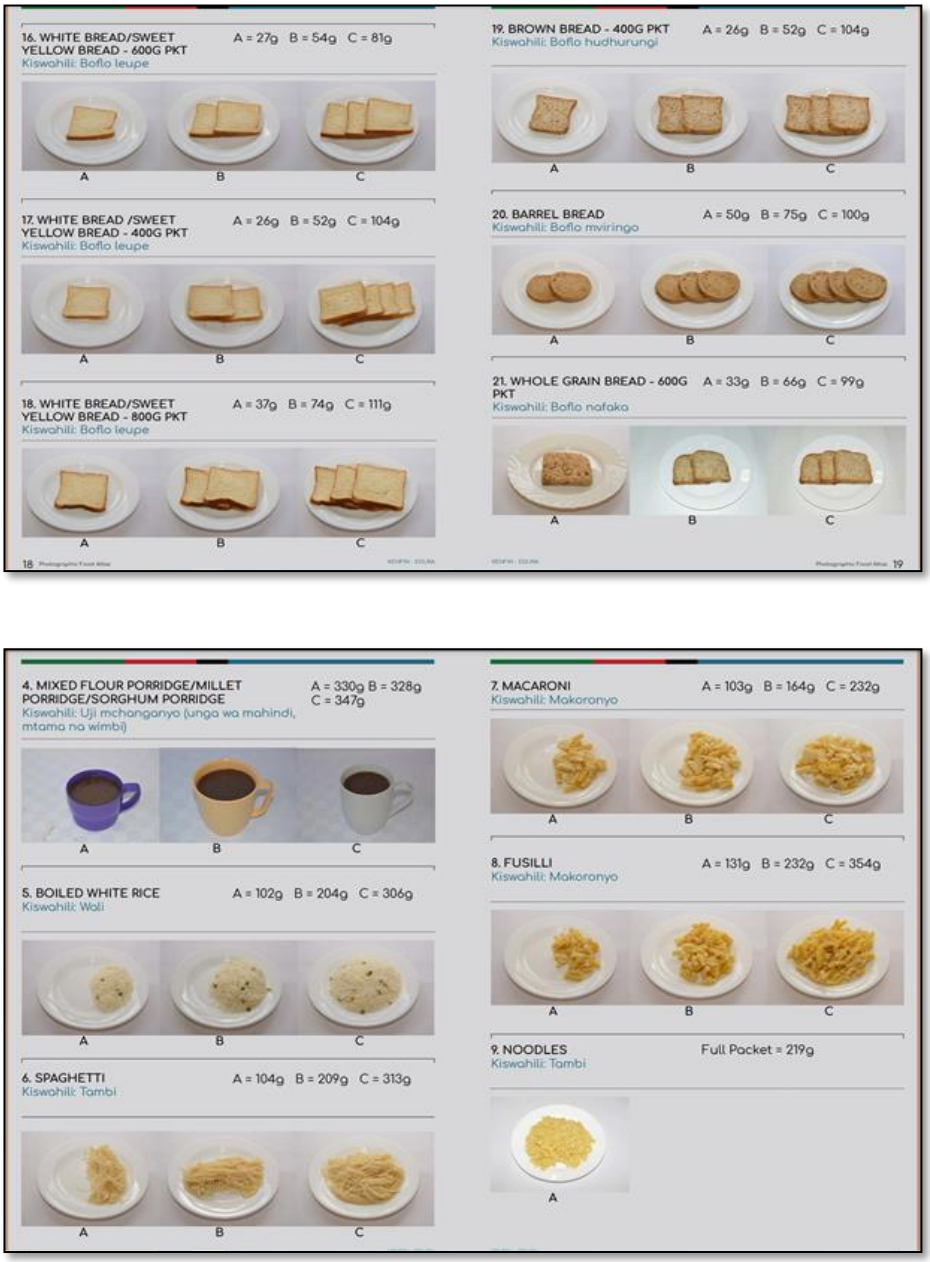

Figure 8: Extracts from the Kenyan food atlas (Anono et al. 2018)

6 Goals, objectives and research questions

This thesis aims to explore the role of dietary counselling in improving nutritional status and reducing the double burden of malnutrition in women of reproductive age and young children in Kenya.

Objectives of the thesis include,

1. To describe nutrition counselling and how it is offered by interviewing healthcare workers.
2. To explore how a photographic food atlas can be incorporated into dietary counselling of women and young children.
3. To provide recommendations on how a photographic food atlas can be included in dietary counselling to motivate women in modifying their dietary intake habits.

The thesis will be aiming to answer the following questions.

1. What kind of dietary counselling is provided by healthcare workers and how is it provided?
2. How can a photographic food atlas be incorporated into dietary counselling of women and young children?
3. How can a food atlas be used in dietary counselling to motivate women and young children in improving their dietary intake habits?

7 Methods

The methodology approach utilized in this study was appropriate for answering the research questions. The approach was identified as practical, realistic and suitable according to the aim of this study. The data analysis process and the outcomes of the analysis are systematically described by the author.

7.1 Qualitative approach

A qualitative approach was used in this study to gain a better understanding and explore dietary counselling according to the healthcare workers' experiences. This approach aided in finding answers to this study's research questions. According to Sharan and Tisdell (2015, 6), qualitative research involves the collection and analysis of non-numerical data in an organized and systematic method. This results in a deeper understanding of social behavior by exploring experiences and interpretations of specific populations.

Qualitative research process involves the researcher identifying with people's perceptions and understanding of a phenomenon in question. Furthermore, the researcher develops insights, concepts and understandings from patterns in the information gathered from the population. In qualitative research, the researcher considers the study settings and the people in a holistic manner, studying them in their present context and examining the people from all perspectives. This research method ensures meaning is emphasized in studies (Taylor, Bogdan & DeVault 2015).

Information about healthcare workers' experiences on the role of dietary counselling in improving the nutrition status of women of reproductive age and young children in Kenya was collected using thematic interviews. Qualitative interviews are considered dynamic and flexible. They involve face-to-face encounters between informants and researchers with the intention of understanding informants' perspectives on experiences, lives or situations (Taylor et al. 2015). During interviews, conversations between the researcher and the informant are targeted on specific questions relevant to the research study (Sharan & Tisdell 2015,108).

An interview guide (see Appendix 1) was developed for this study and all questions were flexible and open-ended to allow respondents to answer without restrictions. The themed questions based on the study's research questions, were to guide the conversation during the interview sessions (Sharan & Tisdell 2015). Specific information was required from the informants relating to the role of dietary counselling. Collecting information through interviews provided insight from the health workers point of view, which was important as healthcare workers were involved in the daily counselling of mothers and children. Interviews are relevant when one requires the collection of knowledge about how people reason, act in relation to a phenomena or experience something (Brinkmann 2013, 49).

The current thesis was implemented in Kenya's Nairobi County, Kahawa West region, a rapidly developing urban city and area in the country. This area is continuously undergoing a health and nutrition transition among its population, which has influenced the development of unhealthy dietary behaviors. It also represents the majority of Nairobi's growing population.

7.2 Data collection

Purposeful sampling method was used in this study to select study informants. Patton (2015) defines purposeful sampling as the selection of knowledge rich study participants to provide specific information required regarding the topic or question of interest. Study participants selected are usually of specific nature and substance and provide in-depth understanding and insight important to the aims of the study. Suri (2011) similarly defines purposeful sampling as a method allowing the researcher to identify and select knowledge-abundant individuals able to provide in-depth information related to the phenomena in question.

Purposeful sampling method was selected for this thesis to provide the writer with possible participants full of insight and profound understanding regarding the research questions. Additionally, it enabled the researcher to access key informants in the field of nutrition, maternal and child healthcare. Purposeful sampling allows for the effective utilization of limited resources as the selected participants have both the knowledge and experience on the research topic (Patton 2015).

Inclusion criteria for the study included participants willing to participate in the study and sign the paper consent form. Additionally, healthcare workers working with mothers and young children were included in the study. Healthcare workers were also required to have knowledge of the national languages English or Swahili.

In this case, research participants were directly selected by the researcher with the aid of the Kahawa West Health center community health worker. The community health worker shared information about all the potential healthcare workers working in the health facility and suiting the study's inclusion criteria. The author then purposefully approached the healthcare workers one by one and introduced the study. All approached participants agreed to participate in the study. Participation in the study was voluntary and no incentive was provided for participatory in the study. Consent was gained both orally and on paper and an interview date, time and place agreed upon by both the author and the participants.

Data collection was executed at the healthcare workers working stations within the Kahawa West public health center. One-on-one interviews with the chosen participants were held to aid in data collection. Only the author and the participant were present during the interviews. Semi-structured questions were used during the interviews to ensure all research questions were addressed. This allowed for focus to remain on the issues relevant to the study questions (Brinkmann 2013, 21). The author asked questions in English and Swahili language depending on participant's choice.

The interview questions were pre-tested on a nutritionist and dietician matching the inclusion and exclusion criteria. Due to constraints in time and distance, the pilot-testing interview could not be implemented face-to-face. The questions were sent to the nutritionist, and the suggested alterations wrote on paper and sent back to the author. Pilot-testing the research tool ensured information collected from the interviews was reliable, productive and relevant (Lo-Biondo-Wood & Haber 2014).

Participants were provided a number code for the interview, "person 1" for the first interview, "person 2" for the second interview and "person 3" for the third interview. The number codes were used in the interviews instead of the participants real names. Each interview took approximately 25–40 minutes. The researcher's own audio recorder was used to record all the interview sessions. This provided proper access to interview answers which would have been difficult to capture in memory (Taylor et al. 2015, 126). The author also wrote down notes during the interviews.

The number of informants for this study was six. Brinkmann (2013, 58) states that if sufficient thought is provided during interview participant selection, a small number of interviews might be sufficient to answer the research questions. Data saturation was achieved at the sixth interview as the researcher did not receive new or further insights regarding the research

questions. Suri (2011) suggests that data saturation will be achieved faster especially if data collection questions are precise. Data collection lasted for one month.

7.3 Data analysis

Thematic analysis was used to enable the author gain understanding of dietary counselling's role in improving the nutrition status of women and young children in Nairobi, Kenya. Thematic analysis is an approach used to identify, interpret and describe recurring information or patterns in a specific set of data. This analysis approach enables organization of data sets to facilitate a deeper understanding of the topic or area of interest (Braun and Clarke 2006). Furthermore, the steps used in analyzing this study's results ensured that essential views from the interview transcripts were gathered. Thematic analysis involves a six-step process (see Figure 9) which ensures that data is managed in an organized and trustworthy manner. (Nowell, Norris, White & Moules 2017).

Figure 9: The six step thematic analysis process (Nowell et al. 2017)

An inductive approach was used, whereby the writer identified and developed themes from the data collected. Nowell et al. (2017) describe inductive analysis as a process whereby data coding is performed without attempting to adjust into the researcher's already preconceived notions or already pre-existing coded constructs. Rather, the analysis process is driven primarily by the data collected, allowing the author to gain rich insights into the research topic. Analysis of data using this method involves examination and re-examination of concrete pieces of data, abstract concepts and ideas to create meaning and understanding of the situation under study (Sharan and Tisdell 2015, 202).

Phase 1: Familiarizing with the data

After data collection was complete, the author started the transcription process. This involved listening to the recordings and typing everything out on the computer, word for word. In all the six interviews, both Swahili and English languages were used interchangeably. This verbatim transcription process was followed by a second listening of the recordings to confirm the accuracy of the written transcripts. The necessary adjustments were executed and the writer proceeded to print out the transcribed data. The use of transcripts provide a substantial base for data analysis, although regular cross-checking from the original audio

recordings is recommended to minimize the errors in this phase of data analysis (Greenwood, Kendrick, Davies & Gill 2017).

Approximately 21 pages of data was printed out in Trebuchet font, size 10 with a line spacing of 1,5. Initial thoughts were written down in a personal-critical journal which the author utilized in collecting and interpreting data, creating and discussing the themes. The entire transcription process lasted 6 days. The MOT dictionary was used as a referral guide to ensure accuracy in the translation process. The author actively read and re-read the transcripts, searching for patterns and meanings in the data (see Table 1). During this process, the author created markings on the transcripts and wrote down short comments to aid in familiarization of the data.

Informant	Data extracts from transcripts
Person 1	Firstly, I see it as very important. Because there are those with the tendency that just because someone is ill, they have to eat a special diet.
Person 3	It's very important, this nutritional counselling. Because for us, especially in this setting, this women, many are not educated at all. As in they have learnt maybe up to form 4, class 8, so don't know much about nutrition. They only know about, uuum… I'm supposed to feed my baby, and I'm supposed to feed him many times. But they don't know exactly what.
Person 5	Very important. It's very important because at times you can assume they know but they don't, or, information keeps changing almost every day, so you find that what you were doing the other day, is not what will work today. So you give them information to update them. Also, there are new mothers. They are just very new, and they don't know anything. So when you give them information, they know where to start and how to go about it. So it's very important and very key.

Table 1: Example of data extracts marked during the familiarization phase

Phase 2: Generation of initial codes

The comments and markings created from the familiarization phase aided in the primary coding of the data. This phase included assigning initial codes to the data in an organized and systematic manner. As Table 2 shows, the writer commented on specific phrases which seemed interesting and meaningful, with regards to the research questions. This coding was

done directly on the printed transcripts, using a colored marker. The author developed and modified the initial codes while actively reading the data sets.

Informant	Data extracts	Initial codes
Person 3	It's very important, this nutritional counselling… these women, many are not educated at all. As in they have learnt maybe up to form 4, class 8, so don't know much about nutrition.	Significance of dietary counselling
Person 2	Importance is that they are going to improve their nutrition, and once they have improved their nutrition, even the diseases, now, the children are not susceptible to diseases.	Reduce risks of diseases
Person 6	Nowadays we don't talk of a balanced diet, but food groups. So, you tell her about the food groups, she makes sure to eat at least 5 out of 10.	Recommendations on how to achieve good nutrition
Person 3	If the child doesn't get right diet, issues will start with immunity, delayed milestones, IQ, all those things will affect the baby from there till adult age.	Reduce risks of diseases
Person 4	At least when you give them that knowledge, you are able to see that those values decrease, and also their health changes.	Significance of dietary counselling
Person 1	I mean she should just be checking how the market is. The fruit that is in season at that specific time and is affordable, because if it is in season, even with 5 shillings one will get that fruit.	Recommendations on achieving good nutrition

Table 2: Example of initial coding from a short data extract

Phase 3: Theme searching

From the raw data extracts, 189 initial meaning units were developed. During this phase, the writer refined and combined these initial codes. Some codes collapsed into each other, others were completely renamed and some were discarded .94 potential sub-sub-themes were derived from these initial codes. These sub-sub-themes were refined into 12 sub-themes. The

author re-read all the data extracts and refined the generated sub-themes. The author then wrote down each of the 12 code names on paper with a brief description. This allowed for better visual representation and aided the author to sort the sub-themes into themes.

Meaning units	Sub-themes
Importance is that they are going to improve their nutrition, and once they have improved their nutrition, even the diseases, now, the children are not susceptible to diseases (Person 2). If the child doesn't get right diet, issues will start with immunity, delayed milestones, IQ, all those things will affect the baby from there till adult age (Person 3).	Disease risk minimization and promotion of growth
It's very important, this nutritional counselling… these women, many are not educated at all. As in they have learnt maybe up to form 4, class 8, so don't know much about nutrition (Person 3). At least when you give them that knowledge, you are able to see that those values decrease, and also their health changes (Person 4).	Offer basic knowledge and create awareness
Nowadays we don't talk of a balanced diet, but food groups. So, you tell her about the food groups, she makes sure to eat at least 5 out of 10 (Person 6). I mean she should just be checking how the market is. The fruit that is in season at that specific time and is affordable, because if it is in season, even with 5 shillings one will get that fruit (Person 1).	Provide guidance on proper dietary practices

Table 3: Examples of sub-themes development

Phase 4: Reviewing developed themes

The author carefully contemplated on the relationship between the different codes and sub-themes formed as shown in Table 3. Themes were developed inductively from the raw data in this study and analysis was data driven. Initially, five themes were developed from the raw data. However, after careful refinement, the author collapsed two themes into one theme due to overlapping of data. The author re-read all the categorized extracts under the four themes to confirm whether they appeared to create a logical pattern. Subsequently, the author reviewed the four themes to consider whether they provide an accurate representation of the entire data set. During this phase, the author frequently referred to the raw data. The above steps ensured that validity was maintained throughout the analysis process. Figure 10 illustrates an example of how sub-themes were combined to form a main theme.

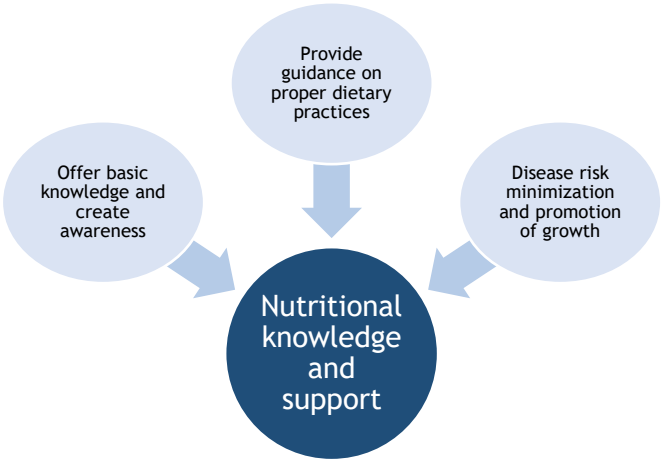

Figure 10: Example of theme development from three sub-themes

Phase 5: Defining and naming of developed themes

During this phase, the author revised the developed themes to understand how each theme represented the data set. Sub-themes under every theme were reviewed to ensure they were structured and provided a narrative which answered the research questions. The author aimed at capturing the main aspects of each theme and determining which element of the data set each theme covered. The twelve sub-themes formed in phase three were further refined to create the four main themes. Four distinct themes were clearly developed and refined from the initial themes and sub-themes.

Phase 6: Report writing

This phase included the generation of an insightful, meaningful, comprehensive, non-repetitive account of the story in the data. An engaging approach was used to generate the

report, ensuring a detailed explanation within and across all four themes. Data extracts were included in the report enabling further understanding of the data and to highlight the prevalence of the themes. Clear examples of extracts were included to clarify the important aspects of the explanations provided. The report generated presented a logical justification and explanation in relation to the research questions.

The sub-themes and themes developed from the data are presented in Figure 11.

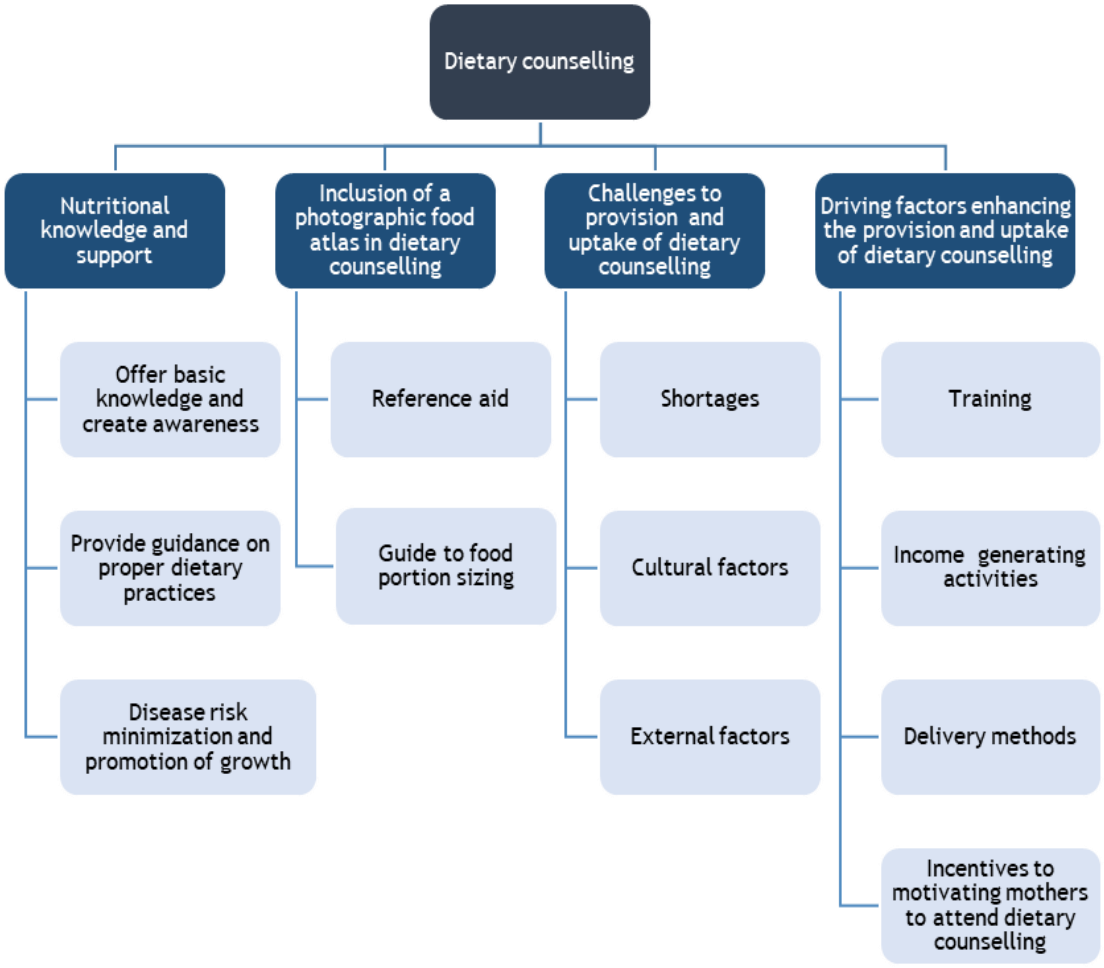

Figure 11: Healthcare workers' perceptions on the role of dietary counselling and integration of a food atlas in dietary counselling

8 Results

In this chapter, the study findings are presented describing the four distinct themes and twelve sub-themes developed from the 189 meaning units. The findings depict a clear description of the healthcare workers' perceptions on the role of dietary counselling and the inclusion of a food atlas in dietary counselling.

8.1 Nutrition knowledge and support

This theme was defined by the participants understanding of how and why dietary counselling is offered to mothers and young children. Interviewed healthcare workers mentioned that dietary counselling involves the provision of crucial and vital information to women and young children hence reducing the burden of malnutrition especially in low social-economic settings. Provision of nutritional information and support was stated as an important aspect in the overall health of women of reproductive age and young children. The sub-themes created under nutritional knowledge and support theme are mentioned below.

8.1.1 Offer basic knowledge and create awareness

The interviewed participants described how information about diet and dietary practices was provided to women of reproductive age and young children. Individual and group counselling appeared to be the two approaches used in the provision of dietary information.

> P4: We give it 1 on 1 or sometimes we can also give them as a group esp. if mothers are starting ANC or just coming to the clinic. But if they are many or attending different clinics, then we give group counselling. But if there are those with personal nutritional issues, then we give 1 on 1.
>
> P6: For me, when I go to my households as I collect the monthly data, I explain to them, depending on the individual's situation.

The provision of dietary counselling was expressed as crucial especially in the low social-economic setting where the study was implemented. It was apparent from the participants that women from this region were poorly educated. Interviewed participants expressed the necessity and significance of providing dietary information to women since majority have insufficient knowledge about nutritional issues.

> P3: It's very important, this nutritional counselling. Because for us, especially in this setting, these women, many are not educated at all. As in they have learnt maybe up to form 4, class 8, so don't know much about nutrition. They only know about, I'm supposed to feed my baby, and I'm supposed to feed him many times. But they don't know exactly what.
>
> P5: It's very important because at times you can assume they know but they don't, or, information keeps changing almost every day, so you find that what you were doing the other day, is not what will work today. So you give them information to update them. Also, there are new mothers. They are just very

> new, and they don't know anything. So when you give them information, they know where to start, and how to go about it. So it's very important and very key.

The aspect of change was reported by two participants. Participants mentioned noticing a difference in women after offering dietary counselling. One participant explained noticing changes in their monthly reports on the health status of young children visiting the Kahawa West public health center.

> P4: When we are doing the reports, there is a place where we need to check those who have been underweight, overweight. At least when you give them that knowledge, you are able to see that those values decrease, and also their health changes. So it's not just about the data, we want to have a healthy society.
>
> P6: It has meaning because you can see there is change especially in those who you have visited and seen that something is not going well, and you have you have spent time with them and talked to them. You see there is change after 1-2 months.

8.1.2 Provide guidance on proper dietary practices

Participants described providing information on diverse types of foods as important to women. Different food groups were mentioned by participants. Moreover, participants also mentioned food charts which were represented on the walls of the heath center with illustrations of the ten food groups. Women were advised to mix several types of foods from these different food groups to promote good nutrition. One participant mentioned that currently, women were advised on food groups and not balanced diets.

> P3: For 1 on 1 sessions especially, you show mother for example the food groups, first maybe the foods in their own food groups then when they are mixed as a variety and then the food portions. So you tell her "No, you have to give carbohydrates, proteins and vitamins, look at this chart here, try and combine those foods at least four to five groups". Tell her to mix at least 4 four food groups.
>
> P6: For example, you go into someone's house, you find that the children are not okay, some are in poor condition, so you tell the mother how she should feed these children. You use all the foods. Nowadays we don't talk of a balanced diet, but food groups. So, you tell her about the food groups, she makes sure to eat at least five out of ten.
>
> P5: Nowadays we stopped classifying carbohydrates, proteins, like that. They have been put in food groups, where you find foods with the same nutrients are the same groups, so that is why we use the ten food groups.

Interviewed participants mentioned the varied materials and tools that were utilized in the provision of dietary counselling to women and mothers with young children in the Kahawa West Health Center. Informants provided examples of these materials and tools used in dietary counselling.

> P2: They have the SOPs, the standard operating procedures and also they have the charts"… "With the job aids, the nutritionist can demonstrate and also show the mother, like if you are telling the mother to have like 3 types of food groups, you are able to show the mother these are the food groups you are telling her, this one and this one, like that.
>
> P3: Charts, placards to demonstrate to mother
>
> P4: We have charts showing healthy diet, food plates with fake foods some showing different foods, amount of servings that you need. Also, cereals like groundnuts which can used to demonstrate amount that needs to be consumed.
>
> P5: I use these charts, flipcharts, I have food demos and fake foods which I show them, real demos with mothers, how to hold baby while feeding, I also engage mothers to teach each other, ask a question, they answer themselves then you just add on the answers and info they give.

Dietary counselling involved provision of information about accessibility and affordability of different foods. Women were advised to follow the food market patterns and buy foods according to what was in season and within their budget ranges. Seasonal foods such as fruits, were mentioned as readily affordable in the market. Healthcare workers emphasized on locally available and affordable food items since some women related healthy eating with expensive eating.

> P1: I mean she should just be checking how the market is. The fruit that is in season at that specific time and is affordable, because if it is in season, even with five shillings one will get that fruit. Even with five shillings, one will buy one banana, one orange or one mango... So variety of foods but with less cost. So healthy diet doesn't mean expensive like chapati, meat. Some think like that when you tell them about eating well. Just plan with budget available.
>
> P2: She is told on types of foods, if there are supplements to be taken, and she is told to use the readily available foods.
>
> P6: Also, she does not have to eat the expensive food, but what is present and available in the market.

8.1.3 Disease risk minimization and promotion of growth

Two informants mentioned the importance of good dietary intake habits in reducing the risks of future health problems. Healthy dietary behavior was linked to the proper growth and development of young children. Moreover, the consequences of improper nutrition were described by one of the study participants to be among the crucial information which women receive during dietary counselling.

> P2: Diet is very important, also for the brain, formation of the brain. So it's important to put more effort in dietary and also, it improves our health.
>
> P3: Because if the child is not provided with the right diet issues start such as with immunity, delayed milestones, IQ, and these affect the baby from there till adulthood.

Women including mothers and young children with diseases such as tuberculosis, which was common in this low socio-economic setting, usually suffered from lack of appetite, leading to malnutrition. One informant working with mothers and young children suffering from tuberculosis at the health center mentioned providing advice on the consequences of poor dietary practices to the subsequent health of the mother and the child.

> P1: …they have loss of appetite as the body is quite disease stricken … if the woman doesn't eat well, drugs will overcome her body. Even if she does not have appetite, we first advice that she eats a very small amount of food. Even just two or three spoonful's of food. You know if there is a lot of food, even the heart does not want. But if she eats like two to three spoons first, takes a break then eats another, at the end of the day, she will have eaten enough so that the medications do not overcome her.

8.2 Inclusion of a photographic food atlas in dietary counselling

This theme indicated the participants' understanding of a photographic food atlas, its potential application and its contribution in the nutritional counselling process. The photographic food atlas was shown or described to participants at the end of each interview session. The two sub-themes described under this theme related directly to the informants views on how a photographic food atlas may be incorporated into dietary counselling.

8.2.1 Reference aid

This sub-theme captured the different ways in which a photographic food atlas may be beneficial to all mothers and young children being offered dietary counselling. The pictorial aspect of the photographic food atlas aided in supporting the information provided by the healthcare workers to the mothers and young children.

> P6: With pictures, as you show the mother, you can explain what type of food it is and what benefit it gives to your body.

The element of memory retention was mentioned by three healthcare workers. The photographic food atlas would assist in ensuring mothers retained the information provided during dietary counselling sessions. Showing the mothers pictures of the foods being discussed, practically, was important in ensuring that mothers recognized and remembered the nutritional advice provided.

> P2:That one would be very good, because you are showing the mother practically this is ugali, beans, some vegetables, she is able to see. Pictures are enough. The information you get from pictures is abundant than what you are told by word of mouth. It sticks quite fast.

> P6: So you show them and they are left with some photographic memory. You find that the one who really has interest will follow.

The photographic food atlas would also assist healthcare workers in enhancing their own memory and retention of information. Additionally, it would act as a reference material for both healthcare workers and mothers during the dietary counselling sessions.

> P1: You know at the end of the day, not everything remains in your head, you have to refer somewhere and what you saw. So even though you knew everything, if you refer, you remember more things.

One participant stated that using the photographic food atlas would ease understanding and communication between the provider and recipient of dietary information. According to the participant, language barrier becomes a problem especially when mothers mention food names in their own native language. A food atlas would minimize language barrier problems as both mothers and healthcare workers will utilize the food illustrations to promote understanding of both parties without using specific food names.

> P5: Mother comes in speaking only Kikuyu or says something in her mother tongue which I don't understand so someone else has to be called to do the translations. For those mothers who may mention a food name in their own native language and you don't understand, if you show her the pictures and ask her which food it is and she shows you, you get to understand for example "Mathoroko". She can point at the food and say that it looks like this.

> P6:Pictures can help because you see when you talk to the women, they think you are just giving them stories.

Interestingly, one participant commented on the ability of the photographic food atlas to increase mothers' attention during dietary counselling sessions. The curiosity created through pictures would aid in retention of attention and mothers would look at more pictures due to interest created from the previous pictures.

> P1:Pictures speak more. Because you see like leaflets, people mostly don't read. If it is a picture, they will pay attention and ask, "what is this picture saying?" They will start seeing more, even things they were not expecting, but when they see it and look at that picture and the next, then even the other pictures there, they will go through them.

Moreover, another informant commented on the visual representation provided by pictures in the food atlas. She remarked that visual pictures would allow for easy relation with the foods as mothers practically see the foods shown to them.

> P3: They will see and associate with the foods in the pictures for example "this I see in the market, this I can get, this I don't know what it is".

8.2.2 Guide to food portion sizing

Two participants practically explained how a photographic food atlas would be utilized in providing advice about the recommended amount of food to consume depending on the mother's or child's situation. The photographic food atlas was recognized as an aid to

estimating the amount of food or drink consumed by a mother or a child. The use of portion sizes was also described by the participants.

> P1: Mostly we talk of information on portions. What kind of portion you should eat.
>
> P3: … you show mother for example the food groups, first maybe the foods in their own food groups then when they are mixed as a variety and then the food portions.
>
> P5: Sometimes a client may ask ”you have told me about mandazi, so do I eat one or two?” So with this book, after you see the grams and calculate calories and breakdown, then you will know what can the client eat and not eat. You can ask “is this the cup you used? How much? Half or full? So you can estimate if the child got enough or not. Or with the spoons, you practically show the mother what type or size of spoon to use to know amount to feed child…

One participant particularly related the use of a photographic food atlas when providing counselling to mothers on diet related diseases. Diabetes was acknowledged as one of the diet-related diseases requiring adjustments in dietary behavior to promote its management.

> P5: With this, even teaching diabetics will be easier. For example, here where there is bread, you can tell the client “If the bread is 400g, you can eat two slices, and eat this brown one making sure it is the real brown one or real whole meal bread”…

8.3 Challenges to provision and uptake of dietary counselling

This theme focused on the healthcare workers’ views and experiences on aspects which hindered the provision of dietary counselling to mothers and young children in the health center. Additionally, the theme covered aspects hindering the uptake of dietary counselling by mothers. A number of challenges were raised during the interviews. These challenges were viewed as contributing factors to the poor delivery and uptake of dietary counselling information in this setting. Factors affecting the provision of dietary counselling in this study setting seemed to be similar according to all those interviewed.

8.3.1 Shortages

Participants described the difficulties faced in their everyday counselling work due to inadequacies in staff. The number of workers did not match the amount of work in the health center. The health center received clients in vast numbers on a daily basis but the number of healthcare workers was low. Low human resource and high workload appeared to be directly related to time.

> P3: The biggest challenge is numbers. Because you see, it is just me and so many mothers. You try to be compassionate because you know this child is innocent but what can I do … and sometimes there is only so much you can do with the strength you have and the workload.

> P4: Sometimes the mothers come and find that there is no nutritionist, or the nurse that is present is in another clinic so she won't get any service or they get scanty services. You see we are few and they are many, we are not able to go through one by one.
>
> P5: Another challenge is that sometimes they are too many. Yes, workload is very high.

Scarcity of nutritional supplements was emphasized by four participants. Mothers and young children suffering from or at risk of malnutrition received free nutritional supplements from this governmental health center. However, participants reported shortages of these crucial supplements. One healthcare worker described how clients endure for months without access to these important nutritional supplements.

> P1: There are those supplements that we give the sick. Most of the time, we do not have them. They are provided by the government, but they say that there are no funds.
>
> P3: Availability of supplements, maybe the child needs supplements but the supplements are not available. Like now, we have not had supplements for children suffering from severe acute malnutrition so the nutritionist has had to keep referring them to another facility.
>
> P4:Sometimes we have less supply of these nutrients. So clients go for even two months without these supplements.

Space limitations in the clinic was mentioned by two informants. Healthcare workers are not able to provide individualized counselling and spend time with mothers and their young children due to lack of space.

> P5: Because you see here, especially now when we are saying that we maintain physical distance space is so limited. Sometimes you can't do one on one as there is no space so we just do group counselling so mothers are not themselves at risk.

8.3.2 Cultural factors

A number of cultural aspects were indicated by the study participants as hindering the implementation of dietary counselling to mothers and young children in Kahawa West health center. Three healthcare workers mentioned local traditions and pre-existing beliefs in the community. One participant mentioned specific tribes eating specific foods as a general practice. Another participant stated that old nutritional practices acquired from generations were still being practiced.

> P1: Us Kikuyus especially don't observe what we eat. But most of the time we are eating carbohydrates alone. We buy rice and cook with potatoes and that is it. There is this mentality, I don't know where they got it from. Somewhere in the village. That the food cooked for a baby includes pumpkin and potatoes and banana, that's it.

> P3: They only know what was taught by their grandmother, that you give pumpkin and pawpaw, so that's all the baby is eating. But the mother doesn't know it's wrong. It's a big problem in this low socioeconomic setting.
>
> P4:You know outside there we have a lot of traditional myths? So, like the pregnant mothers are being told not to eat eggs or to eat avocados.

Another aspect noted by the interviewed participants was the mother's approach towards receiving dietary advice and attending dietary counselling sessions. According to one of the participants, mothers were always in a hurry to leave the clinic before receiving dietary counselling from the healthcare workers. A number of mothers did not seem to understand the relationship between their child's anthropometrics and their overall health and wellbeing. Another healthcare worker recounted working with mothers who did not accept the dietary information provided to them.

> P3: Another is the attitude of mother. I don't know where they rush to. So the mother comes and tells you just give me the book I go as I was only coming for a weight measurement. And this mother doesn't know that this weight is the baby's life. She just wants the book to go. You tell her no, wait, I need to see the weight, if she needs any vitamins or anything…the mother is already angry and can't take in any advice… Mothers don't come back when they are supposed to come back to the clinic or they miss the return or follow up days as they have no knowledge of how baby's nutrition relates to baby's growth as a whole.
>
> P6: In the community, not all accept what they are told. So you talk and talk but the mother is not even with you.

8.3.3 External factors

The element of poverty and economic hardships was reported by majority of the interviewed healthcare workers. All Six participants indicated that poor socio-economic status translated to poor nutritional outcomes in the community. Mothers were unable to purchase the locally available foods due to inadequate funds. One participant mentioned that although mothers may be willing to follow the dietary counselling advice provided, they are unable to afford these foods even from their local markets.

> P1: Everyone you talk to, tells you that they have no money. They say, "you see now the way the economy is bad and there is no work".
>
> P2: Mothers are from very poor backgrounds so can't afford even the locally available foods and cant therefore eat the diet you are telling her about.
>
> P4: As much as you tell them what they need to eat, most of them are not able to afford. So, they are not able to afford these foods, or if they do, they afford today, but can't afford tomorrow.
>
> P6: Now, during Covid, you go and explain to someone about nutrition and they tell you "Even if I wanted to, I have no money".

Alcoholism was also described as a contributing factor in hindering the implementation of good dietary practices. According to one participant, several alcoholic mothers lived in the poor village neighboring the health center. Alcoholism resulted in problems complying with medication and purchasing the recommended nutritious foods from the local market.

> P1: Another challenge is alcoholism. You know that if a person is an alcoholic, they will not adhere to medication or will later on default and will be a defaulter.
>
> P2: Some of the mothers here are alcoholics because of this estate here, this village called Soweto. So sometimes because of indulging in alcoholism, they cannot buy food. That is one of the biggest challenge. Whatever they have been told to buy, they can't. Because sometimes a mother will tell you "I can only afford one meal".

Unrecognized, underlying problems among many of the mothers receiving dietary counselling information was an element described by two informants. A number of mothers in the community suffered from mental problems including depression and marital problems. These difficulties interfered with the mothers uptake of dietary counselling advice. One healthcare worker commented that these underlying problems prevented many mothers from practicing healthy dietary habits even though they were physically and financially capable of doing so.

> P4: You find most of them are in some in broken relationships or marriages, so a person has other issues apart from food problems. You see, a person's nutrition is not only about eating, it's even the mental wellness, physical wellness. If someone has been given nutrition advice and is maybe being physically abused at home, still they will get stressed and will not be able to eat. So you find a person who while they can afford the food, they are physically and mentally unwell.
>
> P5: Mother comes with depression or other issues so you find that she is not listening to the information you are giving or concentrating. So you end up having to address these other issues first, and some are beyond my capabilities.
>
> P6: I think some are very depressed. Because you go to talk to a person and she tells you they have no time for you. Yes, some tell you "No, not now. I don't want. Because what you will tell me will not help me for now."

Gaps in the follow-up of participants was reported by some participants. Some mothers provided false personal data, resulting in loss of contact after their first visit to the health center. Shortage of follow-up healthcare personnel renders follow-up of mothers and young children in the community as challenging.

> P1: I asked one why she does not usually come when she is supposed to come for a follow-up session and to pick her medication. She said " you know I have to look for work and at the moment I am not at work So you try to monitor but the person provides false information or bio data. Therefore, a lost follow-up.
>
> P3: So if there was someone to reach them in the village to follow up… because for us, we are here Monday to Friday so who will do the follow up? Mothers

> don't come back when they are supposed to come back to the clinic or miss the return or follow up days.

8.4 Driving factors to provision and uptake of dietary counselling

This theme summarized the healthcare workers' experiences on aspects which may enhance the delivery and uptake of dietary counselling in Kahawa West health center. The sub-themes focused on elements of both the mothers and healthcare workers in promoting dietary counselling.

8.4.1 Training of all cadres

The provision of regular trainings to healthcare workers would ensure they were all up to date on basic nutritional issues. Four participants proposed the training of all cadres of healthcare workers on the essentials of nutrition, including the different food groups and malnutrition related information.

> P3: Training is important… I think that basic knowledge about poor nutrition and what can be done is important… So it's important for both the nurses, the doctors, even the volunteers. Everyone who is coming into contact with the mothers and the children.
>
> P4: Training would be very nice… So if we had that knowledge, you don't have to start calling her on the phone to ask her "what do we do or what do we give", you just do it yourself. So if at least some of us are trained, or if one person is trained in each department, it would be nice…
>
> P6: We need more trainings on nutrition since there are updates every now and then so that we can be able to give back to our community. Nutrition like updates, food groups , early disabilities…
>
> P2: People will need to be done capacity building, those trainings, everybody… Specifically dietary counselling and also the food groups. Yes. I hear there are ten food groups, but now if you have not been trained, then you might not know what is in each food group.

8.4.2 Income generating activities

The promotion of income generating activities and support systems which would aid in creating a source of livelihood for women in this low socio-economic setting was viewed essential by participants. Revenue generating activities or support groups would assure that women received a consistent pay and were capable of purchasing nutritious food items from local markets.

> P6:If they can be put in support groups. Gather them and show them about savings, how to open small businesses, to support themselves. With the money saved everyone will try to improve themselves and with a business, you see they get income every day, so they can support their families.

> P5: If there are any other activities because some mothers don't have money or any job at all and this is Nairobi. Maybe if we can teach them or find a way to teach them to get more income.

8.4.3 Delivery methods

Two suggestions were provided on different approaches to extending nutritional knowledge to mothers in the community, especially those not attending clinics. One participant mentioned broadcasting important nutritional information on television and radio stations in different language.

> P3: You can see those adverts even on TV, on radio. I think even for nutrition, they can throw something small in there, short information, even in these vernacular stations. We are just trying to reach women wherever they are. Some will not come to the hospital.

The other participant recommended a more practical approach involving cooking sessions with mothers during dietary counselling to practically demonstrate to mothers on various ways to blend foods depending on the food groups.

> P5: There can be something like, you see cooking? You demonstrate to mothers how food can be cooked while combining the foods. There can be something like cooking classes. You show her how she can cook and how she can serve the baby.

8.4.4 Incentives to motivating mothers to attend dietary counselling

An interesting contribution from two participants was the aspect of providing incentives to mothers and young children to inspire mothers to attend dietary counselling sessions and attend clinics for follow-up sessions. This would also motivate mothers to listen and follow the dietary advice provided by healthcare workers.

> P2: If it is possible or if you are able to give the vulnerable ones like two meals in a day, even if not for a long time, it can really motivate them. You will see them a lot. If you are able to give them like beans, rice, the dry foods, it can help so much since they can't afford.

> P6: I think they need something to motivate them. Like, giving them a snack to eat. Like when you are talking to them, you give them some bread and milk. You see the mother will then gain interest because you know at the end of the day, she will not need to go hustle and look for that milk and bread. She will just go home.

Another interesting aspect raised by one participant included complementing the mother's efforts in modifying their dietary habits or that of their children as a way of maintaining the mother's motivation.

> P5: Maybe acknowledging any nutritional improvements no matter how small the improvement. Even with failure of improvement, just motivate the mother

> as you analyze if ... Do a good climate setting with them and acknowledge efforts they do.

9 Discussion

The aim of this study was to explore the role of dietary counselling in improving nutritional status and reducing the double burden of malnutrition in women of reproductive age and young children aged 6-23 months of age. Three objectives were identified for this study. These included describing dietary counselling and how it is offered by interviewing healthcare workers, exploring how a photographic food atlas may be incorporated into dietary counselling of mothers and young children and suggesting recommendations on how a photographic food atlas may be included in dietary counselling to motivate mothers in modifying their dietary intake habits. Four major themes were created from the findings of this study. These themes will be discussed in detail in relation to literature.

9.1 Nutrition knowledge and support

The role of nutrition support and counselling in influencing dietary intake habits of mothers and young children is indeed crucial. Mistry et al. (2019) stated that counselling mothers on nutrition may aid in improving optimal feeding habits and reducing undernutrition in young children.

Based on the interviews conducted during this study, it was evident that healthcare workers considered dietary counselling as crucial in improving the nutritional status of women of reproductive age and young children. Reinsma, Nkuoh and Nshom (2016) study findings also suggested that counselling of mothers and caregivers of young children increased their knowledge on proper breastfeeding and complementary feeding habits, eventually improving the health and wellbeing of their young children.

Informants mentioned the importance of advising mothers on the various food groups as per the recommendations by the Food and Agriculture Organization of the United Nations 2021. Additionally, the importance of demonstrating to mothers the various ways of mixing various foods to diversify their diets and improve dietary practices was also acknowledged. Similar to these findings, Negash , Belachew , Henry , Kebebu, Abegaz and Whiting (2014) reported that dietary counselling modified and improved complementary dietary practices of Ethiopian mothers to more diverse and nutrient-dense foods promoting their childrens' nutritional status. The United Nations International Children's Emergency Fund (2019) affirm that nutrition counselling, information and education deeply influence the long-term dietary habits, food choices and overall nutrition of mothers and young children.

The United Nations International Children's Emergency Fund (2022) also recommend that part of maternal postnatal care include counselling women on nutritional matters. Providing nutritional advice during this phase ensures that both the mother and the growing child receive updated and crucial information on dietary recommendations.

The individual and group approaches in provision of dietary counselling were both utilized by the healthcare workers in their daily counselling to convey important advice on dietary recommendations. One informant implied that group counselling was generally offered due to the large numbers of mothers with young children. Individual counselling was offered to mothers and children already at risk of malnutrition. However, both approaches have previously been suggested as effective in promoting the nutritional status of women and young children (Agbozo 2016; Davis, Brown & Ramsay 2017; Nsiah-Asamoah et al. 2019; United Nations Children's Emergency Fund 2021). Individual counselling is regarded as important for specific individual requirements as the health care provider is able to prioritize nutritional interventions based on individual requirements.

Vasiloglou et al. (2019) discuss the patient-centered approach whereby the client identifies the nutritional problem and the healthcare worker advises the client on potential solutions. Additionally, the individualized approach is identified as the best way of providing dietary advice to mothers. Contrary to this, findings by Bhutta et al. (2013) state that combining both individual and group approaches is more effective compared to each of these approaches independently.

Nsiah-Asamoah et al. (2019) study findings describe how dietary counselling was organized for the entire group of mothers at the beginning of each clinic day. Although individual counselling was also offered, it was more of a didactic approach whereby the healthcare worker did most of the talking and rarely provided solutions to improve the nutritional status of women or young children. Bolognese et al. (2020) findings on the effects of group versus individual counselling concluded that the participants' preference is important when deciding which intervention to use in counselling. However, in most resource constrained areas, participants receiving dietary counselling are not offered the opportunity to decide which counselling intervention would be most suited to their requirements.

Healthcare workers inferred that many mothers attending this government owned public health clinic were either poorly educated or did not have sufficient knowledge on nutrition issues. This intensified the importance of offering dietary counselling services to women of reproductive age and their children. In the study by Davis et al. (2017), healthcare workers detailed how low knowledge impeded mothers from implementing the recommended dietary practices, hence the requirement to offer dietary counselling to these mothers. Sarki, Robertson and Parlesak (2016) studied the association between different factors and

malnutrition among mother-child dyads in Nepal. Their findings suggested that better educated mothers were less likely to have underweight or overweight children.

One informant in this study commented on mothers not knowing what foods to give their children, hence feeding them the same foods daily and repeatedly. This aspect was related to the mother's poor knowledge about different food groups. Cárdenas-Fuentes et al. (2021) study findings on maternal educational levels and diet quality concluded that higher maternal knowledge level was linked to high dietary quality in children among other factors.

The current study informants mentioned starchy staples as common complementary foods given to young children. One participant commented on the kikuyu community's consumption of rice and potatoes on a frequent basis. Furthermore, informants described how mothers frequently fed their young children with a mixture of banana, pumpkin and potatoes. One informant described pumpkin and pawpaw as a common food mixture fed to young children in this study region. The United Nations International Childrens Emergency Fund (2019) recommend that young children between 6-23 months should consume a minimum of five to eight food groups. This diversity in their diet will ensure children consume enough nutrients necessary for growth and development.

Healthcare workers mentioned informing mothers on the different food groups, food diversification and methods of feeding their children. Dietary counselling offered to mothers in this study was broad and non-specific. Nutritional information provided to mothers was based upon the general recommendations on the available teaching aids inside the clinic. Information on food groups was based on Kenya's Ministry of Health nutrition recommendations. These food groups were displayed on wall charts (see Figure 12) found in majority of the consultation rooms in the health center. Healthcare workers mentioned encouraging mothers to use their mobile phones in taking pictures of the food groups' charts for memory.

Figure 12: Chart showing the ten foods groups (Ministry of Health Kenya 2020)

In this study, healthcare workers clearly understood the importance of counselling mothers on the utilization of locally available and affordable foods to enhance their nutritional status. Healthcare workers strongly advised mothers to identify and utilize foods grown locally as they were readily available and affordable. This finding is supported by the United Nations International Childrens Emergency Fund (2019) recommendations which specify that mothers should be advised on utilization of locally home-grown foods.

Waswa, Jordan, Herrmann, Krawinkel and Keding (2015) findings stated the importance of utilizing locally available foods to enhance dietary diversity and quality especially in poor socio-economic areas. This is in contrast to the Nsiah-Asamoah et al. (2019) study in Ghana whereby healthcare workers rarely mentioned the use of affordable and available food options to mothers attending the clinic. Furthermore, The Global Food Policy Report (2017) reports that affordability of energy sufficient diets in developing countries has increased whereas the ability to afford healthy or nutrient dense diets has gradually reduced, promoting the consumption of cheap, overprocessed and unhealthy diets.

In this study, informants linked good dietary habits to the proper growth and development of young children. Healthcare workers provided examples of positive effects of good nutrition including brain formation, low susceptibility to diseases, less hospital visits, reduced health costs and a healthy society. Moreover, the negative effects of poor nutrition were also stated by the healthcare workers including delayed milestones, low Intelligence Quotient, impaired walking in children and poor immunity.

The World Health Organization and United Nations International Children's Emergency Fund (2021) state that introducing a diverse and healthy range of complementary foods to young children prevents illnesses and death, promotes healthy development and growth and prevents overweight and obesity in later life. Moreover, improper nutrition during childhood may lead to micronutrient deficiencies, wasting and stunting, which may have long-term consequences in children.

9.2 Inclusion of a photographic food atlas in dietary counselling

The photographic food atlas was viewed as a potential and important additional reference and teaching material in dietary counselling of women of reproductive age and young children. An interesting finding of this study was that healthcare workers considered pictures important in enhancing memory, retaining information and understanding in mothers receiving dietary counselling. The practicality of the photographic food atlas in dietary counselling to both the healthcare workers and the mothers receiving nutritional information was also discussed by this study's informants. Similarly, Foster, Hawkins, Barton, Stamp, Matthews and Adamson (2017) and Szenczi-Cseh, Horváth and Ambrus (2017) studies described the practicality and easy use of the photographic food atlas as a positive alternative to using other methods such as weighed food diaries in dietary counselling.

Additionally, Ferreira et al. (2021) and Szenczi-Cseh et al. (2017) acknowledge that the photographic food atlas is practical to use as it is cheap, convenient, easy to reproduce, adaptable to different populations and easy for healthcare workers to transport. Photographic food atlases also include a diverse range of various foods. Practicality of the photographic food atlas is also viewed as crucial in saving time, a constraint common in resource-poor settings such as those in this study.

Informants viewed a photographic food atlas as simplifying communication between mothers and healthcare workers. A photographic food atlas may be utilized as a reference material during dietary counselling, allowing for better understanding for women receiving nutritional information. The aspect of language barrier may also be reduced as informants mentioned that using a photographic food atlas in dietary counselling allows healthcare workers to literally show the mother different foods and portion sizes without specifically mentioning the food names.

The use of a photographic food atlas in measuring food portions consumed by individuals suffering or at risk of malnutrition-related problems was an interesting finding in this study. Mothers or young children suffering from diabetes or hypertension may be counselled on the recommended food portion sizes to consume using a photographic food atlas .One informant illustrated the use of the food atlas in dietary counselling of a diabetic woman. The woman can be practically shown pictures of different locally available breads in different portion sizes and the right amount to consume depending on the calorific content of the bread.

Contrary to this study findings, Asar, Hakeem and Rafi (2017) and Flax et al. (2019), found a number of limitations in the use of photographic food atlases. Food atlases are often designed for particular populations and specific age groups hence applicability varies between different countries and different populations. Furthermore, issues in clarity of food photographs has been observed in these studies as limitations. Another disadvantage of the photographic food atlas is the flat slope phenomenon and regression mean effect, whereby there is under- and overestimation of food portion sizes (Jayawardena and Herath 2017).

According to this study's findings, one informant stated that for the photographic food atlas to be useful in dietary counselling, it should be age group specific for the young children, have locally available foods and be reproduced into small pamphlets to be distributed to mothers. This would allow for its use in different parts of the country. Similarly, Jayawardena and Herath (2017) found that foods to be included in a food atlas should be common foods available at the local market. Overall, all six informants in this study viewed the photographic food atlas as a very useful and convenient aid to include during dietary counselling of women and young children.

9.3 Challenges to provision and uptake of dietary counselling

All six informants in this study acknowledged the same constraints in relation to availability of the required resources. Shortages in staff, time, nutritional supplements and space appeared to affect to the quality and quantity of dietary counselling offered to mothers and their young children. Study findings by Davis et al. (2017) reported the importance of having access to adequate resources to enhance the delivery of information to mothers during dietary counselling.

Scarcity of resources was a major impediment to offering dietary counselling to mothers in this study's setting. Kahawa West health center received large numbers of clients on a daily basis. Informants mentioned shortages in staff, time and nutritional supplements which raised challenges in providing dietary advice to mothers of young children visiting the clinic. Vasiloglou et al. (2019) narrative review study results suggested that adequate resources including time are important for healthcare workers to create good therapeutic relationships with clients and understand their nutritional attitudes, beliefs and preferences.

Extreme shortage of health care workers may deter the capacity of health care delivery systems to provide the necessary health services in low socio-economic settings (Ghosh-Jerath, Devasenapathy, Singh, Shankar & Zodpey 2015). Subsequently, the prevalence of malnutrition may increase due to the inadequate provision of nutritional services to the community.

According to this study's findings, space for offering individual dietary counselling to mothers was limited due to the large numbers of clients visiting the clinic on a daily basis. Consultation rooms in the clinic were shared by health workers for different tasks. For example, the room used by the nutritionist to offer individual counselling was also utilized by other staff members to provide antiretroviral medication to mothers coming to the clinic specifically for these medications. Similarly, results in the Nsiah-Asamoah et al. (2019) study showed that inadequacies in space resulted in healthcare workers offering dietary counselling to mothers outside under a tree, with a chair and a table.

This study results also found that individualized counselling was difficult to offer to each and every mother due to constraints in both staff and time at the clinic. Similarly, Riang'a et al. (2020) results mentioned that one on one counselling on diet was impossible due to the large numbers of mothers attending the clinic. Consequently, counselling was provided only to those already having nutritional problems, not those at risk of nutritional problems.

Individual counselling was regarded as a time-consuming activity. The United Nations International Children's Emergency Fund (2021) states that although considered essential in addressing individual nutritional requirements, individual counselling may be time consuming especially in inadequate resourced settings. This is similar to Nsiah- Asamoah et al. (2019) findings whereby constraints in time and staff resulted to nutritional information being passed on quickly to mothers attending child welfare clinics in Ghana.

Moreover, this study found that time and staff constraints resulted in healthcare workers spending limited time with mothers and their young children. Dietary counselling offered to mothers was limited and compact. Riang'a et al. (2020) findings ascertained that healthcare workers were unable to spend adequate time with mothers to gather comprehensive information on the dietary habits of mothers and their children due to inadequate time. However, this was also perceived as a possible excuse provided by healthcare workers. Additionally, Nsiah- Asamoah et al. (2019) found that counselling was more of a one-way approach whereby the health care worker talked and the mother listened. Mothers were not provided with a chance to ask questions after dietary counselling was provided, due to time constraints.

This current study's findings recognized that not all mothers visiting the clinic received satisfactory dietary counselling. Although group counselling was provided to all mothers in the

waiting area, informants raised a number of concerns. Mothers who feared asking questions in public usually went away unsatisfied. Furthermore, long queues meant that some mothers went home without receiving dietary counselling from healthcare workers. Similar findings were mentioned by Riang'a et al. (2020) whereby mothers received very limited information.

Nutritional supplements required by mothers and young children at risk of developing nutritional problems was a major challenge in this study setting. Mothers and young children went for days or months without receiving the required or prescribed nutritional supplements. Riang'a et al. (2020) and United Nations Children's Emergency Fund (2021, 12) have previously detailed similar findings whereby shortages in nutritional supplements create a challenge in the management of nutritional problems among mothers and young children.

Cultural factors including the mothers attitude and cultural beliefs and external factors including poverty, alcoholism and psychological issues were among the impediments to the provision and adherence to dietary advice. These findings corroborate with findings from Davis et al. (2017) study, whereby healthcare workers reported attitudes, poverty, cultural beliefs and knowledge as factors hindering mothers from seeking nutritional information and modifying their dietary habits.

The influence of grandmothers on the dietary intake habits of young children was an interesting finding in this study. Mothers are misinformed on feeding pawpaw and pumpkin to their children on a daily basis. The World Health Organization and United Nations International Children's Emergency Fund (2021, 80-81) corroborate this finding, stating the strong influence of mothers-in-law and grandmothers in the feeding practices of young children in Africa, Asia and Latin America. Traditional practices, taboos and social norms substantially impacted on the feeding habits of mothers and children.

Another interesting finding in this study regarding cultural factors was that mothers were provided inappropriate dietary advice in the community including avoiding animal source foods until the child reaches 18 months of age. For example, feeding eggs to children was thought to delay walking and speech (Waswa et al. 2015; Kimwele & Ochola 2017). Additionally, pawpaw was thought to cause pneumonia, sugar interfered with children's immunity and fish was believed to enhance intelligence (Kimwele & Ochola 2017).

Informants in this study mentioned psychological and emotional status of the mother as impeding factors to the uptake of dietary advice provided by healthcare workers. Healthcare workers also attributed these factors to the poor socio-economic status of the community. Similar issues were acknowledged by Vasiloglou et al. (2019) as challenges in the adherence and compliance to dietetic advice provided to mothers by healthcare workers. Mothers with underlying issues affecting their physical and mental health were less likely to receive and follow nutritional advice offered to them by healthcare workers. Two informants in this study

recognized the effects of problem drinking on the nutritional status of some mothers in the study region of Kahawa West. Mothers are unable to afford nutritious diets due to alcohol addiction. Findings by Mulia, Schmidt, Bond, Jacobs and Korcha (2008) describe the role social stressors play in influencing the likelihood of women from poor socio-economic settings in developing alcohol-related problems. Social stressors including economic hardships, stressful life events and neighborhood unrest may influence the tendency of women developing alcohol problems.

9.4 Driving factors to provision and uptake of dietary counselling

Cooking demonstrations with mothers were considered as possible motivational approaches during dietary counselling to practically aid and inform mothers on different methods of cooking and mixing foods from different food groups. Furthermore, cooking demonstrations would inform mothers on how to utilize the cheap and locally available food items. Similar studies performed by Waswa et al. (2015) found that using cooking demonstrations as a dietary counselling intervention improved the nutritional knowledge of mothers and motivated them in modifying their dietary intake practices. Moreover, the dietary diversity of complementary diets was promoted by cooking demonstrations.

Healthcare workers perceived the dissemination of nutritional information to mothers in the community as important. Different approaches were suggested to ensure mothers in the community, especially those not attending clinics, received nutritional knowledge about important issues. The utilization of media platforms including television and radio was perceived as a potential driver in the promotion of dietary counselling information. Similar to this finding, Manikam et al. (2018) affirmed how listening to the radio, reading newspapers and magazines enhanced the probability of mothers practicing good dietary behavior. Moreover, the utilization of different communication channels including mass media to enhance and influence the improvement of dietary practices in communities is also recommended (United Nations Children's Emergency Fund 2021, 11).

An engaging finding of this study was the aspect of training and capacity building of staff. This was emphasized by all healthcare workers as crucial to the provision of adequate dietary counselling to women of reproductive age. Training and information sharing about basic nutritional knowledge was described as important to all cadres of health professionals. Informants suggested that training be provided not only to nutritionists, but also to all healthcare workers involved with children and women. Knowledge on different food groups and different forms of malnutrition would ensure all healthcare workers receive up to date nutritional information and are equipped in providing dietary advice to mothers. Vasiloglou et al. (2019) findings suggested that education and training of health workers is crucial for effective counselling on nutrition to be offered.

Nsiah-Asamoah et al. (2019) observed that many health workers lacked the knowledge about the nutritive composition of complementary foods and how to improve the nutrient and energy density of complementary foods provided to young children. Additionally, many healthcare workers providing dietary counselling are inadequately equipped with precise knowledge on infant and young children feeding practices with regards to complementary foods, portion sizes and diet frequency.

Currently, minimum effort has been placed in capacity building at all levels including systemic, organizational and professional levels. Nikièma et al. (2017) findings suggest that training healthcare providers especially on individual-centered counselling may improve client compliancy, aid in positive dietary behavior change and improve follow-up of recipients.

One informant working in the community suggested that training be extended to community health workers and volunteers coming to daily contact with mothers and young children in the community. This corroborates with Kohli and Chadha (2017) findings which affirm that community health workers aid in positively modifying the health practices and promoting the health of different communities, hence should be well trained on important nutritional information.

Recognizing and complementing mothers on their efforts in modifying their nutritional behavior was perceived as an important motivating factor. One health care worker reported that women should be complemented on their efforts to practice proper nutrition, regardless of how little the effort may seem. This will encourage mothers to continue modifying their dietary habits. Nsiah- Asamoah et al. (2019) concluded from their study results that healthcare workers should be encouraged to openly praise mothers on the little they have done so as to motivate them to continue good feeding practices.

The provision of material incentives to women to motivate them in seeking, practicing and adhering to dietary advice provided by healthcare workers was perceived as important. Two informants noted that providing a snack or food items to women, inspires them to continue practicing the recommended dietary practices and attend clinic for follow-up sessions. Additionally, informants noted the importance of keeping community health workers and community health volunteers motivated. Community health workers and community health volunteers work closely with mothers and young children in the community. Singh, Negin, Otim, Orach and Cumming (2015) findings concluded that incentives provided to community health workers should be carefully planned and adequate. Incentives should also involve empowerment and capacity building of community health workers to ensure effectiveness in dietary counselling provision especially now when the country's health care system is overburdened (Ghosh-Jerath et al. 2015).

9.5 Ethical considerations

A statement from the ethical board was not required for this study. The title of the thesis, aims, objectives and data collection methods were explained to potential informants. A simple and clear written consent form (see Appendix 2 and 3) for interview participation was provided in English language to potential informants at the study site before interview dates and times were arranged. Participants were verbally informed of their rights not to participate in the study. Contact details of interview participants were not recorded to ensure the right to privacy of information. The signed consent paper forms were stored by the researcher in their own lockable suitcase during the study and will be preserved by the author until December 2022. The author's contact details, duration of data storage and information on data access were also clearly mentioned in the consent form.

Ethical issues including risk of harm, conflict of interest, benefits and sharing of study results were explained to the potential informants. During data collection process, informants' identities were protected by the use of codes instead of personal names. This ensured confidentiality was safeguarded and anonymity maintained. Hard copies of the interview transcripts and the signed consent forms will be safely destroyed in Laurea's shredding machine in the Tikkurila library in December 2022. Soft copies of interviews stored in the author's computer and on the audio recorder will also be deleted by the author in December 2022. The author of this study has no conflict of interest.

9.6 Quality of the study

The principles of good research enable the author to define the research questions, gather and record the desired information and implement the proper procedures in analyzing, recording and publishing research results carefully and systematically (European Code of Conduct for Research Integrity 2017). In this study, the author was responsible in ensuring that the healthcare workers experiences and perceptions were clearly portrayed in an intellectual manner. In this study, the European Code of Conduct for Research Integrity (2017) guided the author in ensuring an ethical, practical and authentic study, with assistance from the author's InnoFood Africa research mentor and Laurea University of Applied sciences thesis supervisor.

Credibility was ensured through the use of relevant and recent research articles. Utilization of relevant articles in literature review aided in the understanding of the study's importance and contribution. During data collection, the author wrote down interview fieldnotes which were crosschecked together with the six audiotape transcriptions. Data collection audio recordings and fieldnotes were be kept safely by the author, under a lockable suitcase. Clear explanations of the research process, methodology, findings and conclusions were written down systematically. Purposive sampling method used to select study informants ensured that

information-rich healthcare workers with knowledge relating to the study questions were interviewed. The inclusion and exclusion criteria was strictly followed to ensure relevant healthcare workers were interviewed. Regular video meetings with the author's thesis supervisor and brief discussions with the InnoFood Africa project mentor were held to ensure credibility during the study process.

Transferability in this study involved the systematic, thematic and clear representation of the analyzed research data. The six phases of thematic analysis were clearly described. The creation of themes was clearly and progressively presented. Data analysis included displaying data in a transparent way which allowed for conclusions to be linked with the data (Brinkmann 2013, 113). Data was displayed in a graphical manner to show the connection between different themes and structures. Dahler-Larsen (2008) as cited by Brinkmann (2013, 113) described three rules of displaying, presenting and communicating qualitative data. These include authenticity, inclusivity and transparency.

The study process which lasted about one year (see Appendix 4), was defined and written down clearly to ensure dependability. Data collection tools including audio-recordings and interview fieldnotes were stored by the author and utilized to aid in the systematic analysis of data. Clear rationale for selections and decisions was stated in writing. A personal-critical journal of the research process was continuously in use. The journal was utilized during data collection, analysis and interpretation of findings. This aided the author in the critical thinking process as all ideas and plans were noted down in the journal. Subsequently, justifications for methodology, theoretical framework, findings and conclusions were provided to ensure confirmability.

9.7 Limitation of the study

A potential limitation in this study included time restrictions. The health care center was quite busy, with few healthcare workers working every day of the week. Interviews had to be re-scheduled or cancelled depending on the informants availability. This was quite time consuming. Healthcare workers were eager to participate in the interviews with a condition that the interviews would not last long, due to the heavy workload. Moreover, only six informants were able to participate in the study. One informant cancelled an already planned interview due to health reasons. However, the author managed to re-schedule the interviews to accommodate the healthcare workers work schedules.

Due to the nature of the sampling method, this study's findings cannot be generalized to the general population, rather, interpretation of the results may be limited to the population studied in Kahawa West region of Nairobi city. Nevertheless, the results obtained may also be utilized to influence nutrition policies of other similar populations in other parts of Kenya. Informants were chosen from recommendations of a knowledgeable source, the healthcare

facility's community health worker. This may have created a potential bias on the informants interviewed. Nonetheless, Tongco (2007) mentions that the appropriate use of purposeful sampling is potentially more efficient compared to random sampling as expert informants provide relevant information. Moreover, due to constraints in time and resources, this sampling method was more realistic, cheaper and less time consuming. The interviewers presence and use of an audio recorder may have influenced the informants responses leading to bias. Additionally, interviewees tended to discuss off-topic issues when responding to the open-ended questions.

10 Recommendations

Dietary counselling has a major influence on the nutritional status of women of reproductive age and young children aged 6-23 months. Healthcare workers working with women of reproductive age and young children have a great amount of knowledge about the nutritional issues affecting the community.

Adequate and frequent training of healthcare workers on basic nutritional information would greatly improve the quality of dietary counselling offered. Previous studies confirm that effective dietary counselling requires education and training of those involved in providing the service (Vasiloglou et al. 2019). All cadres of healthcare workers working with women and young children should receive training on the different food groups according to the Food and Agriculture Organization of the United Nations (2021). Additionally, trainings or short courses on different approaches to identifying women and young children at risk of developing malnutrition would aid in the early detection and management of nutritional problems.

Community health workers and community health volunteers play a vital role in the community as they are usually the first contact persons before mothers and children access healthcare services. Considerations on providing community health workers and community health volunteers with updated information about food groups, different forms of malnutrition and early disabilities related to nutrition should be made by the local county officials. This will ensure that information disseminated to the community is based on scientific facts and not misleading beliefs or traditions. Currently, training of one cadre on nutritional matters is limiting especially if the trained healthcare worker is absent from the workplace.

The photographic food atlas may be included in dietary counselling as an additional teaching and reference aid for both healthcare workers and mothers receiving nutritional information. The photographic food atlas includes pictures of locally available foods, in their food groups and weight in grams, hence it may benefit both the healthcare workers and the clients.

During dietary counselling, healthcare workers may practically indicate the different foods to women using the photographs in the food atlas. Results of this study have confirmed that pictorial images may improve understanding and memory, without the constraints of language or low education status.

Considering the food atlas contains weighed foods, it may be an important supplement while counselling mothers suffering from, or at risk of nutrition related diseases including diabetes and hypertension. As mentioned by informants in this study, food portion sizing and food calorie calculation for example for diabetics and hypertensive women will be faster as the healthcare worker can use the food atlas together with the Kenyan food composition table to counsel the mother on the amount and type of diet to consume.

The photographic food atlas may be utilized in demonstrating to women about the different food groups as it is structured according to the ten recommended food groups. Examples of different locally available foods in their specific food groups can be explored during dietary counselling, allowing the mother to relate to these different foods visually and practically by viewing the photographs. Assessing the amount of food consumed by a mother or her child may be done using the photographic food atlas. During dietary counselling sessions, the health worker may use the food atlas for 24-hour food recalls to evaluate if a mother's or child's dietary consumption is sufficient.

Availability of important resources including nutritional supplements given to those at risk or suffering from malnutrition should be maintained by the local area government. Shortage of resources as mentioned in this study greatly affect the quality of dietary counselling offered to women and young children. Majority of the women and children visiting governmental owned healthcare facilities are from low socio-economic settings and are unable to purchase items which they receive for free from these healthcare facilities. A separate budget should be set aside to ensure governmental healthcare facilities across the country have the required essential nutritional supplements.

Follow up of women of reproductive age and young children at risk or suffering from malnutrition should be improved. One suggestion provided by this study's informants includes the introduction of forms or questionnaires which healthcare workers may fill out during dietary counselling. These forms may contain the client's basic information, anthropometrics, information on the type of diet consumed and the planned recommended diet. This information may then be used during the next dietary counselling session to assess the client's nutritional status.

In the case of motivating women of reproductive age and young children in attending dietary counselling and practicing information shared, establishing support groups in the health centers or community settings for those at risk or already suffering from malnutrition should

be considered. In these support groups, women whose nutrition status has improved after receiving dietary counselling may be invited to give testimonies and ideas to other women in the same situation. Pictures or recorded stories or videos may also be used in these support groups to share information on the advantages of dietary counselling and the consequential problems arising from practicing poor dietary habits. This may motivate women as they will relate with others experiencing the same issues hence improving their nutrition and health.

Mentor mothers or community mothers such as those used in HIV/AIDS education, may also be used to motivate women in attending dietary counselling and practicing information provided by healthcare workers. Consequently, mothers will be motivated to attend follow-up sessions at the clinic. Undlien, Viervoll and Rostad (2016) study findings in Kenya affirmed that women support groups may have a positive effect on nutritional status as the prevalence of malnutrition is reduced in children whose mothers attended women support groups.

11 Conclusions

According to this study's findings, dietary counselling is perceived to play a significant role in modifying and improving the nutritional status of women of reproductive age and young children aged between 6-23 months in Kahawa West region of Nairobi city. Several themes detailing the role dietary counselling plays, impediments to its provision and uptake of information, inclusion of a photographic food atlas in dietary counselling and aspects enhancing provision and uptake of dietary counselling information provide more insight to the healthcare workers experiences regarding dietary counselling. Informants emphasized on the importance of offering nutritional information to all mothers with young children irrespective of the challenges faced in their daily duties. It is clear that offering dietary counselling to mothers is aimed at minimizing the risks of malnutrition and promoting good health in women and young children.

Staff shortages, time constraints and increased workload were perceived as connected aspects. Staff shortages resulted in more work per healthcare worker. More work resulted in healthcare workers spending less time offering dietary counselling since they were obliged to serve as many clients as possible. Moreover, cultural and external factors were perceived as powerful aspects influencing the uptake and practice of dietary counselling information provided to mothers. Traditional beliefs and poverty were perceived by healthcare workers as factors deeply rooted in this study region and difficult to accommodate during dietary counselling. It was clear from the healthcare workers' experiences, that although offering dietary counselling was important, challenges facing women of reproductive age and young children directly affected the uptake of dietary counselling information offered by healthcare workers.

In addition, the healthcare workers interviewed for this study emphasized on the importance of training different cadres on basic nutritional information. Informants perceived inadequate training as an impediment to offering good dietary counselling to mothers as well as a driving factor which would allow them to offer quality services to mothers and young children. Capacity building of all healthcare workers working with women of reproductive age and young children was considered as crucial especially due to shortages in staff and time constraints.

The concept of a photographic food atlas appeared to be new among most of the interviewed healthcare workers. Three out of the six informants had a basic idea of a photographic food atlas whereas the other three viewed it as a new concept. However, there was a general perception among the six informants that the photographic food atlas would be a beneficial additional tool in provision of dietary counselling to women of reproductive age and young children.

Further research on the extent to which a photographic food atlas may motivate women and young children to modify their dietary habits in the management of nutrition-related diseases including diabetes, stroke, specific cancers and heart diseases may be important. This may also be important considering this study's findings suggested that the food atlas deepens understanding, enhances memory and retention of information shared during dietary counselling sessions.

Additionally, research on the benefits of dietary counselling using a photographic food atlas may be done to actually evaluate the importance of including a photographic food atlas in dietary counselling. In this current study, the use of a food atlas in dietary counselling sessions was not studied. This may be an interesting area of further research to explore the practical use of the atlas during dietary counselling sessions by different healthcare workers.

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Figures

Tables

Appendices

Appendix 1: Interview guide

1. Healthcare worker opinion on dietary counselling and how dietary counselling is administered to mothers

2. Teaching aids/tools used in dietary counselling such as books, leaflets, photographs, pictures, written material and other material

3. Guiding or teaching materials/tools healthcare workers would like to include when offering dietary counselling

4. Utilization of teaching tools/ materials to motivate mothers to modify their dietary intake habits

5. Views on how dietary counselling may be improved

6. View of the use of a booklet with pictures of different types of traditional foods eaten in Kenya during dietary counselling.

7. Challenges faced when providing dietary counselling to women of reproductive age and young children.

Appendix 2: Participant consent form

Title of the study: Healthcare workers' perceptions on dietary counselling and the inclusion of a food atlas in dietary counselling

Information about the study

You are invited to take part in this research study which is part of the InnoFoodAfrica project. Before you agree to participate in this study, please take the time to read the following information carefully so that you can understand why and how the research will be done.

Purpose of the research

This research aims to explore the role of dietary counselling in improving the nutrition status of mothers and young children and reducing different forms of malnutrition in Nairobi County. Information will be collected on how dietary counselling is offered and how it can be enhanced so as to improve the nutrition status of mothers and young children. This information will aid local health authorities put focus on local solutions to aid in improving the dietary intake habits of mothers and young children in this region.

Type of Research Intervention

In order to explore and provide recommendations aimed at improving dietary counselling services provided to mothers and young children and reduce the different forms of malnutrition, the researcher invites you to participate in a survey. The survey will include an interview to collect data about the provision of dietary counselling to mothers and young children, tools or teaching aids used in dietary counselling and challenges faced when offering dietary counselling to mothers and young children. The purpose of the survey is to gather information on how dietary counselling can be enhanced and to ensure mothers and young children are motivated to modify their dietary intake habits. The interviews will be conducted face-to-face with you and the researcher. The interview will be audio recorded by the researcher, and the researcher will also write down some notes only for the purpose of analyzing data for the research.

Requirements to join the Survey

The research will be conducted as part of the InnoFood Africa Food Consumption Survey and will be implemented in Kenya Nairobi county from September to October. The requirements for joining the survey:

1. You are a willing participant
2. You are a qualified health worker
3. You have experience working with mothers and young children
4. You speak the national languages English or Swahili

5. You have signed the participant consent form

Risks

There are no major risks involved in this survey. All activities will be conducted in accordance with the InnoFood Africa project, which complies to local regulations and will be subject to scrutinization by local extension officers. The researcher will use a face mask during the whole interview session as a safety measure against spreading COVID19 virus.

Benefits

You will not receive any direct payment for your participation, but you will get to offer your contribution in improving dietary counselling services and dietary status of mothers and young children in Nairobi County.

Voluntary Participation

Your participation in this research is voluntary. If something happens rendering you unable or unwilling to continue taking part in the mentioned activities you may stop participating at any time without any consequences.

Confidentiality and Personal Data

Information about you will not be shared to anyone outside of the research team. The information collected from this research project will be kept private. Any information about you will have a code number on it instead of your name and only the researcher will be able to relate the code and the identity of the participant. The processing of your personal data and your rights with respect to your personal data processed for the purpose of the research is described in the Data Protection Description in accordance with EU General Data Protection Regulation (GDPR) (2016/679).

Sharing the Results

The knowledge that we get from this research will be shared with your organization or workplace (Kahawa West Health Center). Additionally, the research results will be published to the scientific community through peer reviewed articles, and on our project website through stories, blog and press-releases.

Who to Contact

If you need more information on the mentioned project activities please contact

Master's thesis researcher Mary Muraguri

Laurea University of Applied Sciences, Helsinki, Finland

Telephone number: [redacted]

Email: [redacted]

Thesis supervisor [redacted]

Laurea University of Applied Sciences, Helsinki, Finland

Email: [redacted]

Appendix 3: Certificate of consent

I have read, or it has been read to me, and understood the information that was presented to me. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I consent voluntarily to participate as a farmer in this research.

I hereby give my consent to voluntarily participate in this research survey.

I do consent use of information shared with [Africa Harvest Biotech Foundation International / Chuka University] for statistical evaluations and photos taken during the duration of the project in the development of communication materials or reports which will be used for knowledge sharing purpose.

I hereby give my consent to the processing of my personal data as described to me in the Data Protection Description, which is in accordance with EU General Data Protection Regulation (GDPR) (2016/679). I may withdraw my consent at any time without consequences by contacting:

Master's thesis researcher Mary Muraguri

Laurea University of Applied Sciences, Helsinki, Finland

Telephone number: [redacted]

Email: [redacted]

Name of participant _____

Signature of participant _____

Date _____

Appendix 4: Study timetable

STAGES	**TIMEFRAME**
Planning stage • Topic analysis and presentation • Thesis plan	 • February 2021 • June 2021
Implementation stage • Literature review writing • Data collection • Data analysis and writing findings	 • August 2021- January 2022 • September - October 2021 • December 2021 - February 2022
Final stage • Results presentation and final report • Publication	 • May 2022 • June 2022