

# Influence of Nutrition Knowledge on Healthy Food Choices among Pupils in Nyeri County, Kenya

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**Abstract:** In Kenya, nutrition education is included in the school curriculum as recommended in the year 2009 national school health policy. Nevertheless, policy advocacy and communication strategies on nutrition are relatively weak, and there is insufficient focus on operational research on nutrition. In addition, nutrition education is not taught as a standalone subject and is only infused in science subjects. Consequently, the malnutrition problem is not as well understood as it could be. Modern malnutrition consists in over-consumption of energy dense and fatty foods. These have led to an upsurge of non-communicable and lifestyle diseases such as cancer, diabetes, bone and heart conditions. Therefore, there was need to explore the impact of nutrition education on eating habits in order to help pupils acquire discriminative skills that can enable them make healthy food choices. The pupils can act as agents of change in the community through the symbiotic relationship that exists between the school and the society. This will be the first stage towards curbing the food-related health problem. The purpose of this study was to determine the contributions of nutrition education in enabling pupils to make healthy food choices. The Health Belief Model as a predictor of preventive health behaviour was the guide theory for this research. The study was mainly descriptive in design with purposive sampling as the key sampling technique. The target population was pupils in Nyeri County with their teachers and parents. Data collection tools were semi-structured interviews, and focus group discussions, food diary, and FFQ. Data was analyzed both qualitatively and quantitatively guided by the themes from research objectives. Quantitative data was analyzed using basic descriptive statistics and presented in form of tables, pie charts, graphs, and percentages. The Qualitative analysis involved narrative records and respondents' quotations. The study findings showed that nutrition education was absent from people's lives and healthy eating was not sustained. The study findings may be used by the Ministry of education to inform nutrition education content in the school curriculum.

**Key words:** Unhealthy food, Nutrition Practices, Nutrition Knowledge, Nutrition Education, Healthy food.

## I. INTRODUCTION

Nutrition education (NE) is a food based strategy which allows for community empowerment through information. It is "any combination of educational strategies, accompanied by environmental supports, designed to facilitate voluntary adoption of food choices and other food- and nutrition-related behaviours conducive to health and wellbeing" (Contento, 2011). There are several benefits of nutrition education to healthy living. These include healthy

living due to improved nutritional value of food consumed which may reduce malnutrition and non-communicable diseases; adequate and nutritive diet leads to improved immune system that may result in decreased ill health and hospitalization. In schools, healthy pupils tend to concentrate more in their studies. This will also improve learning in schools due to increased retention, concentration and completion. Further, members of society will also become a more productive workforce (Sherman and (Muehlhoff, 2007). Nutritional Educational Programs (NEPs) promote communication of information which can improve the quality of living. Nutrition Education is a means of promoting healthier eating habits by educating people in making the right food choices and in carefully preparing and preserving foods which have a good nutritional value (FAO, 2008).

Nutrition education is important as it ensures healthy eating habits which improve healthy wellbeing of pupils and society at large. Pupils may share their NE knowledge with parents which may enable a family to practice healthy eating habits. These include parents, children out of school and the elderly (FAO, 2008). NE takes into account current knowledge and how to improve it and involve promoting healthier food choices within cultural boundaries. The knowledge, attitudes and practices of youngsters can be changed so that they practice healthy eating habits.

The pupils who benefit from NE can act as change agents by spreading the message to a larger segment of the population (Rao, 2008). Ideally NE communicates information which must be understood and the best approach is through schools. This is because children attend schools and they are the existing link between families, schools and communities.

The aim of NE is to encourage movement from a knowledge orientation to a behavioural orientation leading to change of lifestyle that will embrace healthy eating for healthy living. It involves not only imparting information or submitting messages, but also getting people to do something different in order to improve nutrition (Contento, 2002). The effectiveness of NEPs is achieved through appropriate NE messages which are reinforced through school, community and home-based food and nutrition interventions. This enables a desirable healthy eating behavioural change that is sustainable (Sherman and Muehlhoff, 2007).

Nutrition Education plays a role in both increasing elementary school students' knowledge and self-efficacy to select healthy food options for healthy living. If healthy food choices are not learned at a young age, children will be more susceptible to NCDs such as cardiovascular diseases, type II Mellitus diabetes and cancer among many others (Nutrition standards, 2012).

NE may help improve household food security status and unhealthful food related behaviours. NE is an antidote to populations predisposed to nutritional diseases. NE can be effective in increasing nutrition knowledge associated which may lead to behaviour change and alleviation of NCDs.

Globally, NE has been addressed in a robust way through charters, frameworks, researches, millennium development goals, action plans and policies for food and nutrition and even development of nutrition education curricula (WHO, 1986). FAO (2003) encouraged nutrition through education by the development of booklets which carried NE topics, classified as education for rural people.

In 2004, WHO addressed the increasing burden of NCD using the policy that aimed at tackling NCDs through the risk factors, unhealthy food choices and physical inactivity. The policy aims at environmental changes and empowerment of consumers to exercise individual responsibility.

In FAO (2005) developed a classroom curriculum labeled promoting lifelong healthy eating habits which highlights the purpose of incorporating NE in primary schools in developing countries.

The curriculum covers topics such as: food and emotional development; eating habits and cultural and social influences; food, nutrition and personal health; food supply; production; processing and distribution; consumer aspects of food; food preservation and storage and food preparation as well as hygiene and sanitation. These are the parameters of an effective NE.

In the United States of America (USA) and the UK, a NE intention program proved both effective and efficient on promotion of vegetable and fruits consumption. This was promoted through the school canteens, posters, hand-out leaflets and training with the aid of fictional cartoon characters. In Honduras, there was an attitude and behaviour change through NE and teaching of agricultural practices on students. The results indicated both crop and dietary diversification. NE was reinforced through classes on nutrition, cooking, agronomy and environmental science (Potenza, 2007). In January of 2010, Michelle Obama announced her childhood obesity initiative to decrease the early onset of obesity by having the federal government partner with local communities (Hellmich, 2010).

One of the goals of any NE program is attitudinal change towards one's lifestyle and eating behaviour. This study attempted to discover whether the NE offered in our schools could change attitudes for the better and if it was diverse.

In Northern India, a controlled trial evaluating a multi-component nutrition intervention in urban adolescents (implemented in the context of concerns about obesity) showed that six months later, the intervention group had improved knowledge, lower consumption of sugar-sweetened drinks and energy-dense foods, greater fruit consumption, and lower BMI (Singhal et al., 2010).

In Africa, South Africa has been leading in NE programs. Some of these include, a community based NE program that was implemented in Free State and Northern Cape Provinces which indicated improved nutritional measurements amongst children. Also, a food Aid program (FAP) implemented in Free State and Northern Cape Province showed improvement of weight status in children (Walsh, 2002). Another NEP in Boitong, SA was undertaken among school children to combat malnutrition. The results indicated that NE is an important tool for combating malnutrition and aiding in making healthy food choices (Oosthuizen, 2010). The researcher has purposed to examine the strategies that can be used to make NE effective including community involvement.

Kenya's high rates of under nutrition are particularly due to insufficient awareness and knowledge on nutritionally adequate diets and limited resource allocation and capacity to support the implementation of comprehensive nutrition programs among other causes (republic of Kenya, 2008). The immediate causes of malnutrition include inappropriate dietary intake-primary among young children and a high disease burden. Most Kenyans still rely on diets composed primarily of staple foods that are not sufficiently diverse in micronutrients, compromising growth and development.

According to WHO (2016) lifestyle diseases are on the rise due to poor eating habits and are causing most global deaths. Many middle income countries are now burdened with dietary disorders affecting 35 percent of children under the age of five years. In 2010, only one in every four countries had formulated a policy touching on food. The latest statistics from WHO (2016) indicate that a quarter of Kenyan women and seven percent of men are either overweight or obese. These statistics indicate that the affected children do not properly access education and if they enroll, their performance and retention are inadequate. This could be due to ineffective teaching of NE offered in schools that may also lack the practice needed in order to make the necessary food choices. This issues need to be investigated

#### *Statement of the Problem*

NCDs are increasingly taking toll of our population where young people are not spared. Overweight and obesity among young population have reached epidemic proportions both internationally and locally. Due to the detrimental health consequences associated with NCDs, there is a need to call for preventive measures. Malnutrition and food related lifestyle diseases like diabetes, bone and heart conditions and cancer are on the rise in Kenya due to limited NE and are the leading cause of deaths (WHO, 2016). According to the 2016

Economic Survey, about 60 percent Kenyans die daily of cancer with most of them diagnosed late due to ignorance. Youth and children who constitute half of the population that is most affected due to peer pressure and ignorance among other factors. This can greatly affect learning and the cost of living might become prohibitive due to medication and healthcare occasioned by food-related ill health. The school is the most important setting to inculcate NE knowledge, values, attitudes and practices as pupils spend most of their time in the primary school. Although studies have been done to assist in assessing nutritional status (Kirimu, 2014), little attempt has been done on NE as a strategy to improve the quality of life and address NCDs.

The task of this study was therefore to explore the contributions of NE in making healthy food choices among primary school children. This could offer valuable insights towards improving NE to enable informed food choice in order to promote healthy living.

#### *Purpose of the study*

To determine the relationship between nutrition knowledge and healthy food choices among pupils.

#### *Objective of the study*

Determine the relationship between nutrition knowledge and healthy food choices among pupils.

## II. LITERATURE REVIEW

### *Nutrition Knowledge and Healthy Foods Practices*

A healthy food is a food item with an increased nutritional value or decreased health risk attributed to a change of food ingredients or cooking methods” (Kwan Lee and Room, 2009). Generally, such a food has low fat and lowered calorie options. It is low in fat and has health benefits.

However, a report of the public health agency (2001) showed that the term ‘healthy eating’, meant cutting down on fried or fatty foods and 51% of the informants also said “eating plenty of fruits, vegetables and salad.” One quarter (25%) thought the term “healthy eating” meant eating of fiber or cutting down on sugar, cakes and candies. Adults from the non-social group were more likely to say ‘reduce fat intake’, (59%). Even though the benefits of healthy eating have been verified, food choice behaviour is a difficult process that involves several variables. Hence, there is need to find more about feelings of pupils and teachers on ‘nutritional knowledge and healthy food practices’ in Nyeri County to offer empirical findings regarding healthy eating in local settings in a Kenyan community.

Increasing nutrition knowledge is associated with positive eating behavior (Wardle, 2000). Available evidence suggests that knowledge alone is not sufficient to influence eating behaviour, and that mediating factors, such as access to the target food must also be present for behaviour change to be

successful (Hoefkens, 2011). Nevertheless, the association between knowledge and behaviour change supports the use of a nutrition education component in interventions seeking to impact food choice. In 2009 Ha *et al* studied the effect of a basic nutrition course on soft drink and fat-free milk consumption of university students (Ha et al, 2009). They measured beverage consumption at the beginning and end of a 15 week intervention with self-reported three day food records. Although the results of this study are promising for the use of nutrition education as a behaviour modifier, the researchers could not tell whether their improvements in food choices were due to the underlying motivation of the students combined with the intervention or to the intervention alone. It was expected that this study would focus on that to provide more insights on factors affecting food choices.

The influence of nutrition knowledge on food choice behaviour is present outside of classroom settings as well. In 2000 Wardle et al, found out that nutrition knowledge is significantly associated with healthy eating habits (Wardle et al, 2000). The researchers used mail services from general practitioner’s patient listings to collect data on dietary intake and nutrition knowledge among adults. Nutrition knowledge was assessed with a validated questionnaire. Data returned from mail surveys of 455 male and 584 female patients from the offices of general practitioners showed that nutrition knowledge was significantly correlated with intake of vegetables. The results also demonstrated that the positive associations between knowledge and the intake of fruits, vegetable and fat were independent of socio-demographic characteristics of the study participants. It was necessary to find out the impact of these variables among pupils and teachers in Kenya and also the similarities and differences and account for them, which were issues of concern in this study.

Although there is evidence that nutrition knowledge influences behaviour change, the preceding studies (Ha et al, 2009; Wardle et al, 2000), demonstrate that it is not likely to be the sole factor in changing food choice behaviour. Results of investigations provide evidence that knowledge may be one among other factors, such as motivation to change, access to the target foods and belief that behaviour change will have a positive effect on future health which together ultimately lead to an individual to change their eating habits; which is one of the concerns in this study. Nutrition knowledge may change food selection behaviour through a change in behavioural intentions and actions. Nutrition knowledge may have an indirect effect on food selection behaviour, as Sharma *et al* found in 2010 in an analysis of calcium intake and nutrition knowledge in adolescent girls established (Sharma, 2010).

Sharma (2010) used data from the ‘impact’ study, an investigation conducted to promote bone mineral density among middle school girls. The investigators performed a path analysis to determine pathways by which variables that influence calcium intake and bone quality interact with one another. The analysis showed that knowledge of calcium-rich food sources alone did not directly influence calcium intake. It

was found out that those participants who both knew that calcium helps prevent osteoporosis and believed that consuming milk would decrease osteoporosis risk were more likely to consume milk than those girls who did not have a positive outcome expectation of milk drinking behaviour. Interestingly, milk availability at home directly influence calcium intake in a positive direction ( $p > 0.05$ ). It would be very informative in this study to find out types of beliefs about foods and how they influenced food choices and eating habits among pupils and the teachers in a local community in Kenya.

Increasing nutrition knowledge is associated with positive changes in food choice behaviour. This association however, may be mediated by factors such as belief in the positive effects of diet change and motivation to change food choice behaviour towards healthier choices. There seems to be a gap between nutrition knowledge and practice which, call for a review and documentation of the nutrition knowledge and practices among learners particularly on healthy foods which is one of the key concerns of this study, (Velma, 2008).

Healthy food behaviour is not created, sustained or improved accidentally. There must be evidence-based data to inform planning of healthy eating behaviour. There seems to be a gap in the nutrition information that should inform healthy feeding behaviour. Nutritional behaviour has significance effects on health. There is need to recognize and strengthen the determinants of healthy eating behaviour to remove barriers which may lead pupils to make unhealthy food choices. In addition, intervention programs for nutritional behaviour promotion should be designed using empirical findings on nutrition education. There was need to find out whether the current nutrition education in schools had the potential to produce the desired effects on nutritional behaviour in students, which this study endeavored to explore and document.

#### *Pupils' Nutrition Knowledge, Attitude and Practices*

Nutrition education is linked to increase in nutrition knowledge, attitude and practices necessary for developing a healthy lifestyle in school children. It has the potential to significantly alter healthy behaviour patterns of pupils and, can therefore lead to improved outlook on nutrition and hygiene (Vivas et al, 2010). Nutrition education improves not only nutrition knowledge and skills but also dietary intake and physical activity as well as nutrition and health status (Sheriff et al, 2008). In addition, practices such as healthy food choices are learned and practiced. Nutrition knowledge is most effective if there is a supportive environment and if nutrition education is linked with practical eating habits, nutritional and environmental activities. These also include school meals, gardening, health and nutrition clubs and programs that offer unique opportunities for practical teaching and learning in nutrition (Vandenbosch, 2010). These were critical issues that this study unraveled to make significant contributions to healthy eating habits and food choices.

Research has however shown that nutrition knowledge is a necessary factor but not sufficient for changes in nutrition-related practices (Worsley, 2002). This may expose the gap that exists between knowledge and practice. Most of the people's food choices are unhealthy in spite of the information available about the dangers of unhealthy eating. A study by Bruget (2008) reported that children are not consuming the recommended amounts of healthy foods. They instead eat too much saturated fat, and take in more energy than they need. This may explain why obesity in children has reached alarming levels all over the world with 45% estimate of deaths of children under age five that are linked to malnutrition (Global nutrition report, 2016).

A study in U.S.A. by Fox (2010) demonstrated that 86% of children consumed either sweetened beverage or salty snack in a day, and that 68% of the children consumed some type of a dessert or candy in a day. In particular, fruit and vegetable intake was lacking. Another study still done in U.S.A. by WittDunn (2012) found out that French fries comprised almost 25% of children's consumption of vegetables. It was notable that overall, consumption of healthy foods did not align with nutritional guidelines or recommendations. This was because food intake was largely determined by food preferences (Russell & Worley, 2008). It was quite instructive to establish what informs food choices and preferences among pupils, parents and teachers in Nyeri County.

Studies have found that nutrition knowledge is a significant predictor of dietary intakes and that it is needed for healthier food choices (Hendrie, 2008). Nutrition practices of pupils are influenced by a number of factors such as school environment, nutrition knowledge, attitudes, cultural beliefs and norms (FAO, 2005). In comparison to the physical provision of food aid, teaching pupils' nutrition is more beneficial because it feeds people for life thus addressing malnutrition problems of the present and future (Mbithe, 2008). It has potential benefits that extend beyond the school environment to improve eating practices. Families may engage in schools through their involvement in family support-groups, parent education classes and accessing resources from school. They also benefit from school projects such as school gardens and farms as food sources (Anderson-Butcher, 2009). It was important that this study would explore and document benefits of healthy eating among pupils and teachers in Nyeri County.

Pupils need nutritional information in order to assess the nutritional value of food products to make healthy food choices. As it is difficult for pupils to determine the nutritional value of a food product by just looking at the packaging, explicit nutrition information needs to be provided on food products. There were various types of information sources yet little was known about the type of nutrition information and sources that pupils used, the type of food consumption patterns related to nutrition information usage and what motivated them to use particular information sources which this study aimed to investigate and document.

### III. THEORETICAL FRAMEWORK

#### *Health Believe Model (HBM)*

This study proposed to employ the health belief model (Becker, 1974) as the theoretical guide to examine the influence of NE on healthy food choices. The fundamental proposition of the health belief model focuses on six tenets.

The tenets are perceived susceptibility and perceived severity of a certain disease, perceived threat of a disease and a calculation of the perceived benefits and barriers of the recommended action which is the preventive health behaviour. Other tenets are self-efficacy and cues to action. Each of these tenets operates on the mind of the individual who has been posed to a health risk and is likely to respond to the situation by taking a prevention action. The cue to change poor eating behaviours may come from pupils themselves, school community members or even society at large because of the symbiotic relationship between school and society.

In this study, the expected action is healthy food choice. The modifying factors and cues can influence these perceptions, but the decision making process is the outcome of mutual interaction of all the six tenets.

The tenets of HBM in relation to this study are perceived susceptibility to developing health effects from not adhering to healthy food choices which could be the real threat of becoming a victim of an NCD. Perceived severity of the health problems that could develop due to unhealthy food choice is another tenet. The degree of perceived seriousness of an NCD that may intensify when an individual becomes concerned with a disease affecting ones' family life, social relations, work and education is another tenet.

Perceived benefits are associated with adhering to healthy food choices which could include leading a life free of NCDs. Perceived barriers that can hinder one from consuming and adhering to healthy food choices which may be factors within one's social or physical environment. Self-efficacy or the belief in being able to successfully follow healthy food choices, and cues to action which can include physical symptoms of a health condition or environmental factors that can motivate people to follow healthy food choices. These could as well be the strategies to promote healthy food choices.

### IV. METHOD

The study will employ Descriptive research design. The key informants will be pupils, teachers and parents. The study will be conducted in The Nyeri County. The target population will be primary school pupils in class seven. Therefore, the study targets primary school pupils as the main sample population because they are in their formative years. In this study, three schools were purposively selected whereby one school has urban characteristics while the other has rural characteristics. Among the three, two were public while one was private. The three schools were expected to be representative of the entire

population because nutrition affects every population regardless of milieu. In this study, the researcher used purposively sample Standard seven pupils since the class was representative of other pupils in the school in terms of syllabus coverage as the pupils had covered most of the syllabus. The data collection tools in this study were: Semi Structured Interview (SSI) and FGD, Food Diary (FD) and FFQ. The data collected was analyzed both qualitatively and quantitatively. The qualitative data was sorted into categories and themes guided by research objectives. Quantitative data was presented in form of tables, pie charts, graphs and percentages.

### V. RESULTS AND DISCUSSION

#### *Nutritional Knowledge versus food practices*

Nutrition education is an important tool for food choice behavior, especially in modern times when most individuals are faced with so much to choose from their foods. In order to describe the nutrition education that the pupils had, the researcher posed several questions, used several discussion guide topics and administered a food diary and a food frequency questionnaire. The food diary was used to capture the practices on diet by the pupils. To begin with the researcher wanted to know whether the pupils knew how to differentiate between healthy and ordinary foods.

In order to describe the eating behaviors' of pupils, the respondents were issued with food diaries and FFQs which they were required to fill in with the foods regularly consumed. Several studies have linked consumption of a diverse diet to improved nutrition status and health (Onyango et al, 2003)

Table 1: Food practices and attitudes

Types of food	School 1 %	School 2 %	School 3 %
Cereals and cereal products	91.7	90.2	96.9
Vitamin A rich fruits	66.7	62.7	79.7
White tubers and roots	55.5	50.7	71.4
Dark green leafy vegetables	62.3	59.9	71.4
Other vegetables e.g. cabbage	86.3	84.5	92.2
Vitamin A rich fruit	51.1	7.9	61.9
Organ meats	42.2	41.3	73.0
Flesh meats	48.6	43.7	37.5
Eggs	32.6	30.7	39.1
Fish	28.1	28.5	26.6
Pulses legumes and nuts	61.1	58.2	76.6
Milk and milk products	70.1	68.2	76.6
Oils and fats	72.6	70.4	79.7
Sweets	71.5	66.7	87.5

Source: Pupils' diary/FFQ

The results indicated that the most common consumed foods were cereals and cereal products which included maize, beans, ugali and bread followed by vegetables such as cabbages, tomatoes and onions. Other foods consumed by most of the pupils were snacks, oils and fats, milk products and sweets such as sugar, sweet juice and sweets. The least consumed of the foods included fish, fruits, eggs and water tubers and roots. The results indicated that oily snacks and sweeteners were the most consumed due to their ready markets around the schools and homes. Fish was least consumed possibly because the food was not locally available and is expensive. Also, it was not culturally considered as tribal food. The researcher probed in an FGD on why most pupils rarely consumed tubers and roots. One of the pupils was quick to remark,

“My mom sells arrow roots and buys for us bread, sugar, and flour with the proceeds”. These findings indicated that western dietary habits have replaced indigenous eating habits. The western diet is marked by fast foods and oily snacks. This finding agrees with (Kirimi, 2014) who discovered that there is a lot of unhealthy eating among pupils. In the report, 94% ate mandazi, sweets and samosas among other junk foods that were popular among pupils. The findings were similar among both genders, Kirimi further notes that, the habit of eating junk food is likely to make pupils become overweight and obese. The report draws parallels with (WHO, 2013:) global public health survey which observed that childhood obesity is one of the most serious public health challenges of the 21<sup>st</sup> century. Unfortunately, due to ineffective NE big bodies and roundness are perceived as signs of good life. In an FGD one participant remarked, “Thin looking persons look ill health while big and rounded people look well fed and healthy”. This finding is similar to (Kirimi, 2014) who found out that strong socio cultural beliefs do exist in many developing countries that perceive ‘obesity or roundness’ as something to be revered and a sign of wealth and prestige.

Also noted from the analysis of interviews and discussions was that schools do not have food services nor food policies. The finding is similar to another report that stated that schools have no food policy that can be used to advise pupils about eating habits to reduce NCLSDs (Kirimi, 2014). The finding also showed that schools in Kenya do not conform to (WHO, 2013) guidelines on diet, physical activity and health. Particularly lacking are guidelines on healthy foods and healthy food choices. A positive attitude towards nutrition plays an important role in improving nutritional practices among children. Overall the pupils demonstrated positive attitudes toward healthy foods although the scanty knowledge of differentiating healthy from ordinary foods hampered their choice. However, the present study emphasized that positive attitudes influence healthy food choices. A similar finding was recorded by (Velma, 2012) who reported that positive attitudes toward nutrition are considered a pre-requisite for the promotion of appropriate nutrition-related practices.

One way of applying NE is by using the knowledge to choose healthy foods. The researcher established from both teachers and pupils that schools did not have guidelines or feeding policies. This was notable because the pupils ate all types of foods regardless of equality and quantity. There was no clear distinction between healthy and unhealthy food. The absence of an effective feeding policy made the pupil eat a lot of unhealthy foods.

In an attempt to discover the influences that the nutrition knowledge had on healthy food choices the pupils from the sampled schools were each given a diary and FFQ to fill out. The pupils were supposed to fill in the foodstuffs consumed on daily basis for the past two weeks. This was important in order to find out the types of foods consumed and their frequency. The frequencies were then converted into percentages so as to indicate food popularity among pupils. This enabled the researcher to gauge the type of food choice that mainly guided the pupils whether healthy or unhealthy. The findings are found in figure below:

Table 2: Type of Food Choice

Name of the foods	Ingredients/ contents	Snacks	Ingredients/ contents	Drinks	Ingredients / contents
Chips	Fried potatoes, oil	Smokies/samosa	Wheat flour, oil, beef	Juice	water, sugars, sweet, mineral salts, colours
Chapati	Wheat flour, oil	Mandazi	Wheat flour, baking powder, sugar, oil...	Vinegar	Sugar, lemon, orange...
Crisp	Fried potatoes, oil	Bread	Wheat flour, baking powder, sugar, oil...	Juice cola	Water, sugar sweeteners, flavors'
Groundnuts	Fried groundnuts, oil	Cake	Wheat flour, sugar, chocolate	Soda	Carbonated water, sugar sweeteners, flavours
Spaghetti	Spaghetti, stew	Biscuits	Wheat flour, oil		
Boiled eggs	Boiled eggs	Doughnut	Wheat flour, water, sugar, baking powder /		
		'Mutura'	Meat, oil		

Source: pupils' diary/ FFQ

The findings in the above figure show that 95% of the pupils ate cakes and sausages and smokies; - 93% ate chips and 90% ate mandazi, sweets and samosas among other junk foods. The findings were similar in terms of schools, the patterns were similar since cakes and biscuits appear to be the most popular junks. The variations in food eaten are caused by social-economic differences among pupils but all of them consumed junk food therefore making them vulnerable to NCLSDs. These make the pupils to have big rounded bodies.

The findings imply that peers socialize one another into acquiring a culture of consumerism and feeding habits by watching others around them and being actively involved (Kirimi, 2014). The habit of eating junk food is likely to make pupils become overweight and obese. These findings agree with WHO, (2013) global public health survey. Obesity is one of the most serious public health challenges of the 21<sup>st</sup> century. “ The problem is global and is steadily affecting low and medium- income developing countries. The prevalence has also increased at an alarming rate. Globally in 2010 the number of overweight children under the age of five was over 42 million. Among these, 35 million are found in developing countries. The WHO report continues to reveal that, “ overweight and obese children are likely to stay obese into adulthood and more likely to develop non-communicable diseases at a younger age. It is worth noting that overweight and obesity are already established risk factors for cancer.

Diet has been found to be an important factor in the etiology of various diseases and conditions. There is almost a universal agreement that some aspects of the “ Westernized” diet are a major determinant of risk. For instance, high intake of meat and fat increase the risk of contracting cancer. Conversely, risk is decreased by high intake of fruits and vegetables, WHO (2013). The above WHO report brings out the difference between the effects of healthy and unhealthy foods. Moreover, study findings revealed that junk foods were popular among pupils. This was further revealed during interviews and FGDs. They said that junk foods were available in food kiosks and among hawkers and vendors near the schools. They further reported that parents give them money to buy them on their way to school, instead of parking home- made food and drinks. The pupils did not foresee the danger involved in consumption of junks and fast foods. The findings confirm that schools do not have a food policy to guide pupils on what to eat.

This is despite the fact that a food policy is an important preventive education. Such education can enable pupils acquire skills for healthy food choices and hence reduce NCLSDs. In the absence of a formal content on NCLSDs and school policies that should be used to socialize pupils on healthy food choices, peers and the society at large take over. They socialize the pupils into the consumption of junks and fast foods which increase their vulnerability to NCLSDs in the long run (Boulder, 1977).

The findings also show that schools in Kenya do not confirm to WHO (2015) guidelines on healthy diets, practical activity and health. Further, (Adamo, Sheel, Onywera, Waudo, Boit and Tremblay, 2010) Studied about child obesity and further levels among Kenya and Canadian children from urban and rural environments. They noted that increased intake of foods that are high in fat, salt and sugars but low in vitamins, minerals and other micro-nutrients are the major contributing factors to obesity. The report found that seven percent of boys and seventeen percent of girls in rural areas are overweight or obese. The trend is trickling down to rural areas. The

researcher noted that pupils aspired to look big and rounded. They would attain this by frequently eating snacks between meals oblivious of the danger this habit posed. They commented that a big rounded body indicated that one is rich and will most likely be respected.

The above observations agree with Adamo (2011) that found that “ strong social-cultural beliefs do exist in many developing countries that perceive obesity, or roundness as something to be reverend and as a sign of wealth and prestige. Most of the pupils involved affirmed they were taking junk and fast foods frequently. They preferred them to traditional home -prepared foods. Because all the pupils agreed to have been taking junk and fast foods, the researcher observed that affordability was no longer a challenge to them. One pupil responded “ they are packaged in small portions which we all afford.

#### *Junk Foods and Drinks*

Cooking fat has been known to have varying levels of cholesterol, which has adverse effect on health. Cholesterol in the blood and tissues is derived from two sources; - diet and endogenous synthesis. Dairy fat and red meat are major dietary sources. Egg yolk is particularly rich in cholesterol (Kris – Etherton, 2010). Several large Cohort studies have found that intake of fatty acids increases cholesterol and the risk of coronary heart disease. Industrially hardened oils contribute most to fatty acids. Consumption of junk foods and drinks lead to weight gain that may arise from unrestrained fat intake which leads to NCLDs.

## VII. CONCLUSION

Increasing nutrition knowledge is associated with positive eating behaviours, though the relationship is not necessarily direct. Some evidence suggests that knowledge alone is not sufficient to influence behavior, and that mediating factors, such as access to the target food and outcome expectations, must also be present for behavior change to be successful. Therefore, a measure of motivation should be included in research evaluating the effectiveness of nutrition education interventions. The acquisition of nutritional knowledge does little to develop the behaviours needed to counter the social, emotional, and advertising pressures that contribute to unhealthy eating behaviours.

Nevertheless, the association between knowledge and behavior change supports the use of a nutrition education component in interventions seeking to impact food and beverage selection behavior.

The influence of nutrition knowledge on food selection behaviour is present outside of the classroom setting as well. Although there is evidence that nutrition knowledge influences behaviour change, this study demonstrated that it is not the sole factor in changing food selection behavior. knowledge may act in concert with other factors, such as motivation to change, access to the target foods and belief that behaviour change will have a positive effect on future health

which together ultimately lead individuals to change their habits.

Nutrition education offers a critical opportunity for establishing children's lifelong eating behaviours that will promote health and prevent obesity. The school provides an ideal setting for teaching large groups of children healthy eating behaviours in age-appropriate and feasible ways.

### VIII. RECOMMENDATIONS

For curriculum developers, a curriculum that is based in theory, that focuses on improving students' healthy eating motivation, skills, and behaviours in addition to healthy eating knowledge, and that includes food familiarization will experience a better chance for success in educating children with healthy eating behaviours in their day-to-day lives. However, all of these suggestions for curriculum developers require greater understanding of complex school environments (for example, when incorporating theory into the practical situations of lessons), which involves implications for future research in this field. Further studies should also study different effective ways to promote healthy eating habits and propose different ways that the consumer can apply nutritional knowledge to direct behaviour. The goal is for a healthier lifestyle, and one cannot attain that without the proper nutritional application. Following these suggestions for future research and development, curriculum developers, researchers, and school communities should be in a better position to cooperate in ensuring developmentally appropriate, evidence-based, and culturally sensitive healthy eating curricula.

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