AKENTEN APPIAH-MENKA UNIVERSITY OF SKILLS TRAINING AND ENTREPRENEURIAL DEVELOPMENT

NUTRITION KNOWLEDGE AND COOKING PRACTICES OF FAST-FOOD VENDORS IN KUMASI METROPOLITAN AREA IN GHANA

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AUGUST, 2023

DECLARATION

STUDENT'S DECLARATION

I, FLORENCE BRENYAH, declare that this Thesis, except quotation and references contained in published works have been identified and duly acknowledged, is entirely my original work, and it has not been submitted, wither in part o whole, for another degree elsewhere.

SIGNATURE: ……

DATE:……..……...

SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of this work were supervised by the guidelines and supervision of the Thesis as laid down by the Akenten Appiah-Menka University of Skills Training and Entrepreneurial Development.

MAIN SUPERVISOR: **DR. GILBERT OWIAH SAMPSON**

SIGNATURE: ……

DATE:……..……..

DEDICATION

This thesis is dedicated to the memory of my beloved Grandmother, the Late Mrs Janet Kwao-Sarbah. May her soul rest in perfect peace.

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ABSTRACT

Fast foods operators have been identified as stakeholders responsible for meal preparation and provision to majority of the populace. However, there is little known about their general knowledge on nutrition and diet-related diseases. This study therefore aimed at assessing the nutrition knowledge and cooking practices of fast-foods vendors in the Kumasi metropolis of Ghana. This study was a quantitative cross-sectional design conducted in three suburbs (Bantama, Suame and Tafo Sub Metro). A sample of 210 fast-food vendors was recruited for the study. A simple probability sampling technique was used to select the study site and fast-food operators were selected for interview based on chance per their location. The study used structured questionnaire after pretesting at Kwadaso sub-metro. The data generated was entered into SPSS version 25 for analysis. Inferential statistics such as chi-square were used to compare the knowledge scores with the participants' social demographic characteristics. Out of a total of 210 participants recruited for the study, 66.2% were females and 33.8% males. Majority of them were within the age range of 21-25 years, with 5% being 30 years old or older. At least all the participant had received some formal education. More than 80% of them had attained pre-tertiary education. Majority of the participants received nutrition education at the pre-tertiary level, and about 5% at the university. About half of them had inadequate knowledge in nutrition, with 6.2% having adequate nutrition knowledge. A little above 40% had moderate knowledge in nutrition. Also, 60% of the participants had inadequate knowledge on diet-related NCDs while 5.2% had adequate knowledge. A significant difference was observed in the knowledge adequacy among the participants' gender and level of education. Almost all the participants used the same oil several times for deep frying and majority of the participants prepared shito or stew with the re-used oil. In effect, majority of the fast-food operators had inadequate knowledge in nutrition and diet-related diseases. The study recommends that the Municipal Assembly should collaborate with the relevant institutions to organise nutrition and health seminars for all fast-food vendors before certifying their operations. Again, the Ministry of Education should include nutrition and health as a course in the catering institutions.

CHAPTER ONE

INTRODUCTION

1.0 Background to the Study

There has been an obvious change in the life-style and food consumption patterns of many households (Annor & Baiden, 2011). The commitment to food preparation at homes has decreased while the patronage of fast foods continue to rise steadily (R Fariba et al., 2018). By definition, fast foods are wide range of ready to eat foods and beverages, which are sold on the street and public places" (Mukherjee et al., 2018). Fast foods are one of the most viable sources of food which are relatively cheaper and readily available to a large number of people (Mukherjee et al., 2018). Despite the ease of access to these foods, many research outcomes have revealed the negative effect of fast food on health status (Buang et al., 2019; Global Panel, 2017; Olsho et al., 2016).

Research has shown that, fast foods contain health injurious ingredients such as high salt, high sugar, trans-fat, and saturated fats (Kroll et al., 2019; Searcey & Richtel, 2017; Sironi et al. 2004). In order to avert this situation, acquisition of knowledge on nutrition and diet related-diseases by fast food vendors has been shown to be key during the production of meals (Barzegari et al 2011). In promoting societal health, not only the nutritional knowledge of consumers must be considered but also the nutritional knowledge and attitude of fast- food providers are also vital (Barzegari et al., 2011).

Reflecting on the rising food consumption outside homes by consumers, eating-out establishments are playing an important role in meeting this need (Fadaei, 2015; Fariba et al., 2018). Fast foods are widely patronised for their taste, easy availability and reasonable price (Turkistanlı & Sevgili, 2018). One very important aspect related to the

fast foods is its necessity for maintaining the nutritional status of a large section of population. However, they are largely refined, high in salt, sugar and fats. These ingredients, when in excess, lead to the development of obesity and its related Diet-Related Non-Communicable Diseases DR- NCDs (Buang et al., 2019; Global Panel, 2017; Olsho et al., 2016).

These DR- NCDs such as diabetes, cardiovascular diseases, cancers, hypertension and among others have become global disease burden increasing morbidity and mortality (Owino, 2019; WHO, 2018b). In recent times, in Africa, several factors have been linked to the surge of NCDs. For instance, high intake of sodium, saturated fats, trans fats, fibre-poor diets, low intake of fruits and vegetables have been associated with onset of hypertension and diabetes which have become pervasive within the population (Ibrahim & Damasceno, 2012). According to Addo *et al*. (2012) the prevalence of hypertension in rural and urban Ghana is 19.3% and 54.6% respectively. Similarly, the 2018 Global Nutrition Report revealed that, over 400 million people world-wide were diagnosed with diabetes (Development Initiatives, 2018).

Fast foods operators have been identified as stakeholders within the food service value chain and are responsible for meal planning and preparation. They decide on what goes into the preparation and serving of these meals. It is a common practice therefore, to resort to spices containing monosodium glutamate (MSG) to enhance food taste. These MSGs have been linked to the increasing prevalence of Nutrition-related NCDs like hypertension. Also, most fast foods have low fibre and high in oil. The quantities of vegetables used or served are very minimal and therefore the health-protecting benefits of fibre which are mainly obtained from these vegetables may not be obtained by the people who patronise these fast-foods.

According to Reicks, et al., (2014), identified insufficient background and training in nutrition and recipe modification among caterers and chefs as key barriers regarding the preparation of healthy foods in eateries. Mortlock et al. (2000) noted that numerous authors are in general agreement that a good level of knowledge and the effective practice of such knowledge are essential in ensuring the safe production of food in catering operations.

The knowledge and cooking practices of fast-foods providers relating to nutrition and health are important as consumers are increasingly becoming mindful of healthy eating and nutrition. As such, it is important to assess their knowledge in nutrition and diet related diseases to ascertain whether that knowledge affects their practices in meal preparation.

1.1 Problem Statement

Most people, especially in urban centres, have resorted to the daily dependence on fast foods due to work demands and convenience (FAO, 2020; Global Panel, 2017). This increase in the eating out episodes has led to a rise in the establishment of food service outlets in the country; and consequently, to increased competition among these vendors units. As such, many of these fast-foods providers are mainly interested in the taste of the food without recourse to good nutrition (Laar, 2019; Matwiejczyk et al., 2018). These fast foods are usually high in fats, salt, sugar and low in fibre and have been implicated in the rising prevalence of obesity and nutrition related NCDs (Khonje & Qaim, 2019; Searcey & Richtel, 2017). It is therefore important to have good knowledge of these NCDs and the association with diets in order to have good nutrition practices.

Even though fast-food providers in the food industry play vital role in making food accessible to the general public, little is known about their knowledge and practices regarding nutrition and nutrition-related diseases. This study therefore sought to assess the nutritional knowledge and practices of fast-foods providers in Kumasi Metropolis of Ghana.

1.2 General Objective

To assess the knowledge in nutrition, diet-related non-communicable diseases, attitude and practices of fast-foods providers in the food service industry in Kumasi metropolis of Ghana.

1.3 Specific Objectives

1.2.1 To assess the general nutrition knowledge of fast-foods providers in Kumasi Metropolitan Area.

1.2.2 To ascertain the knowledge of fast-foods providers on diet-related non-communicable diseases in Kumasi Metropolitan Area.

1.3.3 To identify the cooking practices of fast-foods providers in meal preparation for clients in Kumasi Metropolitan Area.

1.4 Significance of Study

The study may provide valuable information on the nutrition knowledge and practice of selected fast-foods providers in Kumasi. In addition, the outcome of this study may provide basis for the nutrition curriculum review during the training of these caterers. Furthermore, it may provide useful information for policy development in reducing the incidence of obesity and NCDs. Lastly, the study results may add up to knowledge base in nutrition and food services and provide the basis for further studies.

1.5 Scope of the Study

The research study is limited to only fast foods providers in the food industries. Geographically, the study covered only three suburbs of Kumasi Metropolitan Assembly. In terms of content, the study assessed knowledge in nutrition, diet related non communicable diseases, attitude and practices of the fast-food providers in the food industry.

1.6 Study Limitations

The following were some limitations to the study.

- Due to the unorganised nature of the food vendors, purposive sampling technique was employed. This approach could be subject to researcher bias.

CHAPTER TWO

LITERATURE REVIEW

2.1 Non-communicable Diseases

Non-communicable diseases are diseases or conditions with no known causal agents. They usually occur over an extended period of time and is not transmitted from one affected person to another (Daar et al., 2007). They tend to be prolonged and are the result of several factors including physiological, genetic, behavioural and environmental factors (WHO, 2021). Non-communicable diseases encompass diseases like chronic respiratory diseases, hypertension, diabetes, cardiovascular diseases like stroke and cancers.

Globally, NCDs have been found to be a leading cause of morbidity and mortality, and kill more people than all other causes combined each year (WHO, 2020). Globally, 41 million deaths are attributed to non-communicable diseases each year, representing 71% of deaths (WHO, 2021). Each year, an estimated 15 million people, aged 30 to 69 years, die from an NCD 'prematurely', with 85% of these "premature" deaths occurring in low-and-middle-income countries. Again, according to the WHO facts sheet on NCDs, over 70% of all deaths associated with NCDs occur in low-and-middle-income countries (WHO, 2021).

Improved economic situations and the growing urbanization are significant demographic factors that support the growing the rise in these NCDs. Other factors include unhealthy diet, tobacco use, low physical activity and the harmful use of alcohol. The most significant effects of these factors are increasingly observed in low- and middle-income countries. Although there has been all year-round existence of food due to modernized

systems of food processing and preservation, there also exist the problems of inappropriate dietary choices and decreased physical activity (WHO, 2009).

Over the years, it has been proven that nutrition has been linked to the surge in and prevention of non-communicable diseases, especially those that are diet-related. Dietary practices right from infancy to adulthood depict whether an individual would be a candidate for conditions such as hypertension, diabetes mellitus, or cardiovascular diseases in future times (WHO, 2009). Recommendations about the intake of fruits, vegetables, whole grain cereals, lean meats and low-fat dairy products however, appear as the main dietary requirements to promote good health.

2.1.1 Burden of Chronic NCDs in Ghana

In recent times, Ghana has seen a shift in the major causes of death from communicable diseases to a combination of communicable and chronic non-communicable diseases. The prevalence of chronic NCDs increased as the proportion of people living in urban communities saw an increase from 29% to 44% between 1984 and 2000. The WHO has indicated that NCDs in Ghana has accounted for more than 60% of both deaths and disease burden. In Ghana, NCDs kill over 86,200 persons annually, with 55.5% of these deaths seen in people aged less than 70 years (MOH, 2012). Hypertension, diabetes, stroke and cancers were among the top ten causes of death in 2000 (Agyei-Mensah and de-Graft Aikins, 2010). In the Kasena- Nankana district in the Upper East region of Ghana, about one-fifth of adults were reported to have raised blood pressure (Kunutsor & Powles, 2009).

2.2 Risk factors of NCDs

The risk factors associated with NCDs are classified under modifiable or non-modifiable factors. The World Health Organisation (WHO) has stated that, some modifiable NCDs risk factors include obesity, alcohol and tobacco use, stress, hypertension, physical inactivity and diets high in fat and sodium but low in fruits, vegetables and cereals (WHO, 2018b). Factors that cannot be modified include, increasing age, gender, family history and ethnicity or race. People from African, South Asian, and Caucasian have been reported by WHO, to be at a higher risk than those from elsewhere.

2.3 Non-modifiable Risk Factors

2.3.1. Gender

There are differences in NCD occurrences, complications and burden among gender (Silander et al., 2008). Numbers have shown that though NCDs affect both sexes however, the risks in premenopausal women are less. Studies indicate that men exhibit symptoms of cardiovascular diseases much earlier (7 to 10 years earlier) than premenopausal women, but risks increase in women as they approach menopausal age and this is due to hormonal changes, and at this stage, the both men and women have equal risks (Möller-Leimkühler, 2007; Maas & Apellman, 2010).

From a broader perspective, there are many medical comorbidities and psychiatric disorders that show a gender preference and are associated to cardiovascular risks. Women, for example, are more likely to be depressed and be subsequently diagnosed with metabolic syndrome. Women are also less likely to have a well-controlled blood glucose levels in diabetes, and are prone to develop CVD (Pérez-López et al., 2010). However, the number of premenopausal women with CVD are less than men in the

same age category. The insufficient ovarian hormones at the time of menopause are associated with increased cardiovascular events. Hence, the development of CVD in women is on average, 10years later than that of their male counterparts (Rodgers et al., 2019)

2.3.2 Age

NCD risk increases with advancing age. Increased prevalence of NCDs has been linked to oxidative stress, inflammation and overall myocardial deterioration and degeneration (Rodgers et al., 2019). The left ventricular wall of the heart thickens with age due to increase in size of the cardiac myocytes and increase in collagen. The thickening of the ventricular wall results from increased vascular loading and a decline in the efficacy of β-adrenergic modulation of both the heart and vasculature (Lakatta, 2002). Oxidative stress occurs with the process of cardiac aging. The loss of mitochondrial function, which occurs with increasing age, is significant in the development of cardiac dysfunction as cardiac aerobic metabolism depends on the production of adenosine triphosphate (ATP) (Rodgers et al., 2019).

In Africa, significant differences in sex with regards to prevalence of hypertension have shown to be minimal (Sanuade et al., 2018). However, a study by Gómez-Olivé and colleagues (2017) across six sites in Sub-Saharan Africa, found a significantly higher prevalence in women than men. On the contrary, studies have reported the opposite, with men having a significantly higher than women due to differences in hormonal activity early in life (Hulanicka et al., 2007; Ojeda et al., 2007).

2.3.3 Family History

Family history is one of the non-modifiable risk factors of NCDs, making it important to consider the initiation of initiate antihypertensive or antihyperlipidemic therapy for primary prevention in people with positive parental history of NCDs, especially those who had chronic heart diseases prematurely (Yeboah et al., 2017). If a person's immediate family members, e.g., parents and siblings, had an NCD before age fifty-five, there is increased risk of developing NCDs (World Heart Foundation, 2017). A study conducted on metabolic syndrome and parental history of CVD in young adults between the ages of 20 and 29 years in Accra found that the prevalence of metabolic syndrome was 12.4% higher in females than in males and parental history of CVDs was linked to metabolic syndrome development in females (Yeboah et al., 2017).

2.4 Modifiable Risk Factors

2.4.1 Obesity

Overweight and obesity have been associated with NCDs such as type 2 diabetes, ischaemic stroke, renal impairment and hypertension (WHO, 2014). Over the past few years, the prevalence of obesity has been on a steady rise and this has caused the condition to be described as an epidemic by the WHO (Pérez et al., 2021). Overweight and obesity can be classified using body mass index (BMI); obtained by dividing weight in Kg by the height in m^2. According to the National Institute of Health (NIH), the normal range for BMI is 18.5 to 24.9kg/m^2, while the BMI for overweight ranges from 25.0 to 29.9kg/m^2. Obesity class I is from 30.0 to 34.9kg/m^2, class II obesity is from 35.0 to 39.9kg/m^2 and BMI greater than or equal to 40kg/m^2 is termed class III or morbidly obese (Weir & Jan, 2022) (Jensen et al., 2012). Overweight and obesity have been found to adversely affect metabolic functions leading to effects on insulin resistance, blood pressure, triglycerides and cholesterol (WHO, 2011). An increase in BMI leads to a

steady increase in the risk of ischaemic stroke, coronary heart diseases, and type 2 diabetes mellitus. According to the global nutrition report 2017, high BMI is also associated with increased the risk of cancers affecting the oesophagus (adenocarcinoma), colon/rectum, breast, kidney, endometrium and pancreas (Development Initiatives, 2017).

2.4.2 Physical Inactivity

Physical inactivity is an identified risk factor for NCDs. Over 3 million deaths and 32 million disability-adjusted life years occur each year as a result of insufficient physical activity (MOH, 2012; WHO 2009). Being moderately physical activity for about 150 minutes each week (or equivalent) is estimated to reduce the risk of ischaemic heart disease by approximately 30%, that of diabetes by 27%, and that of breast and colon cancer by 21–25% (Mozaffarian et al., 2014; WHO, 2011). Again, the risk of stroke, hypertension and depression is lowered as one engages in physical activity. Physical activity is a key element in energy expenditure and thus essential when considering weight control and energy balance (WHO, 2011). Evidence suggests that physical activity-related NCD pathogenesis starts from childhood and progresses in adulthood. While children are very active due to their constant playing and running around both at school and at home, the level of activity reduces as they approach adolescence and adulthood, thereby increasing their risk (Resaland et al., 2018).

2.4.2.1 Stress

A systematic review done by Saleem, Durrani, Adeeb, & Siddique, (2020) showed that the most common psychosocial risk factors for NCDs included anxiety, stress, physical inactivity, depression, and low socioeconomic status. They defined psychosocial risk factors as “an extent that possibly connects the psychological phenomena with the social environment and/or to pathophysiological variations to some degree.”

Stress seems to affect food preferences and usually leads to increased food consumption especially foods with high fats and sugar content (Harvard Mental Health Letter, 2012). Physical or emotional distress have been shown to increase the consumption of fats and sugar foods (Spencer et al. 2011). When fat and sugar-filled foods are ingested, there seem to be feedback effect that inhibits processes in the parts of the brain that are responsible for stress and related emotions (Mathes et al., 2009) These foods, considered comfort foods, usually contribute to the stress-induced cravings of people for those foods. People who are stressed also tend to drink more alcohol exercise less, and lose sleep, all of which can lead to excess weight gain.

2.4.3 Harmful use of alcohol

The harmful use of alcohol has been identified as a key risk factor for premature deaths and disabilities globally (Rehm J et al., 2010; Ronksley et al., 2011). A direct association has been found between high consumption of alcohol and the rising risk of cardiovascular diseases liver diseases and some cancers. An association between alcohol consumption and the development of cerebrovascular and ischaemic heart diseases has been noted. Epidemiological data, mainly from high-income countries, points to beneficial effects of low-risk patterns of alcohol consumption on some disease outcomes (Rehm et al., 2010; Ronksley et al., 2011).

2.5 Diet and Non-communicable Diseases Development

Among the several risk factors associated with the development of NCDs, unhealthy diet is key especially in the development of diet-related NCDs (chiefly among them, being cardiovascular diseases). Unhealthy diets fall under the modifiable risk factors and include meals with high fat and sodium content but low in vegetables, fruits, and cereals (WHF, 2017).

It is not possible to generate overall estimations of unhealthy diet prevalence from different types and sources of data, as such, estimates of specific elements of unhealthy diets are presented separately in this section.

2.5.1 Fats and NCDs

Fat intake has generally seen a rapid increase in lower-middle-income countries since the 1980s and this has inadvertently led to increase consumption of saturated and trans-fat. This has culminated increasing the risk of coronary heart disease, and studies have shown that replacing them with mono and polyunsaturated fat could reduce the risk (Clifton & Keogh, 2017). Evidence also suggest a direct association between the risk of type 2 diabetes and the consumption of saturated fat and trans-fat but an inverse association with polyunsaturated (Heileson, 2020; DiNicolantonio, Lucan, & O'Keefe, 2016).

2.5.2 Salt and NCDs

Dietary salt intake is an important determinant of blood pressure levels and overall cardiovascular risk (Ezzati et al., 2014). Recommendations by WHO for salt intake of less than 5 grams per day per person has been noted to help in the prevention of cardiovascular disease (Development Initiatives, 2017). However, data on salt consumption by most populations from various countries indicate much higher levels of salt than recommended by WHO (WHO, 2011). The global salt consumption level is from 9 to 12 grams per day, and decreasing it to the recommended 5 grams per day could massively reduce blood pressure levels and cardiovascular disease (WHO, 2015).

2.5.3 Refined sugar and NCDs

A study by DiNicolantonio, Lucan and O'Keefe, (2016) found that, high consumption of refined sugars were heavily linked to the development of NCDs . The results indicated that even minimally processed products like fruit juices increase the risk of CVDs, especially when they contain varieties of fructose like sucrose. This evidence implicates added sugars and processed foods as an aetiology for NCDs.

2.5.4 Fruits and vegetables and NCDs

Dietary remedies to address the problem of rising prevalence of NCDs include adequately consuming fruits and vegetables. However, consumption of vegetables and fruits is generally low and has been attributed to over 16 million (1.0%) disability-adjusted life years (DALYs) and about 1.7 million (2.8%) deaths globally (Gebremedhin & Bekele, 2021; WHO, 2011). Adequate consumption of vegetables and fruit is linked to a reduction in the risk for stomach cancer, cardiovascular diseases and colorectal cancer (International Food Policy Research Institute, 2015; Wu et al., 2015). Convincing evidence indicate that consuming high levels of high-energy foods, such as overly processed foods high in fats and sugars, leads to obesity compared to foods low in energy such as vegetables and fruits (Gebremedhin & Bekele, 2021).

2.6 The Fast-food Industry

According to Vaida (2013), fast food is any food cooked and vended quickly at a shop, by the roadside or eateries. It is usually ultra-processed and prepared in an industrial fashion, thus, with standard ingredients and consistent cooking methods. It is often nutrient-poor but calorie-dense; low or lack adequate nutrients such as amino acids, minerals and vitamins, as well as fibre. These foods are usually relatively cheaper than the healthier options and also readily available. These, in addition to innovative

marketing approaches used by the manufacturers have increased the patronage of fast food. Fast food usually lacks the important nutrients required to sustain our body health and as such can also be referred to as junk food.

Several classifications of fast foods exist. Firstly, based on the style the food is prepared, presented, and "perception of value". Fast food is defined food produced and served quickly in the 'western style' and which is relatively inexpensive (Omari, R (2014).

The other classification of fast foods, is based on the place of food preparation, vendored or consumed (Rosenheck 2008; Nanema, et al., 2022). These authors, see fast food as convenience food or any food bought in self-service or take-away eating places without the need of a waiter. This classification is in line with the original goal of the fast-food technology which has to do with readily available cheap but filling foods to people on the move (Didarloo, 2022).

Again, from the health and nutrition perspective, Mahna et al. (2022), defined fast food as foods that are nutritionally imbalanced, which, with excessive consumption, could affect health adversely and enhance the risk of developing NCDs. In their study, Ebbeling et al. (2002) and Prentice and Jebb (2003), noted that fast foods had inherent factors that increased the risk for obesity and diabetes. These identified factors were high glycaemic load, high energy density, excessive portion size, and palatability with emphasis on increased developed taste preferences for sugar, fat and salt. However, there are responds to the public concerns about health risks of fast food by some fast-food companies. Thus, these companies are gradually offering healthier options such as low-fat ice creams, salads with low-calorie or fat-free dressings and plain, broiled chicken sandwiches (Public Health England, 2019; Act For Youth Center For

Community Action, 2021). Finally, some authors have classified fast food into western and local (or indigenous or traditional) foods (Olutayo and Akanle 2009; Omari, et al. 2013). Foods such as burgers, pizzas, French fries, hot dogs, fried chicken, sandwiches, and doughnuts are classified as Western fast food and are becoming more and more popular in many developing countries (Seubsman et al. 2009; Omari, 2013Austin et al. 2005).

In Ghana, fast food is akin to street food, which is any ready-to-eat food or beverage prepared and sold in outdoor public spaces like streets, open-air markets, parks, squares). This could be by either wandering or stationary vendors; either on foot or from mobile outlets (e.g., vans, carts, bicycles), from removable outlets (e.g., stalls) or fixed outlets but without indoor space to accommodate consumers (e.g., take-away shop or kiosks with kitchen overlooking the street).

In the past three and a half decades, due to rapid urbanisation which has driven by the combined effects of urban population growth and the spreading of urban boundaries into rural areas, African streets have seen increased proliferation of street foods vending (FAO 2016). Increased demand for these quick, ready-to-eat, inexpensive food has also been driven by the increase in commuting distances from home to work and the availability of these foods close to the work place of the low to middle income working class.

Also, with the limited job opportunities in the formal 'white-collar' jobs, self-employment becomes a very viable way to earn a living; and street fast food vending, in particular, represents one of the easiest and viable opportunities, because little start-up capital and no formal education are required.

2.7 The Eating out Paradigm Shift

The past few decades has seen a paradigm shift in dietary patterns from eating home-cooked meals which are less processed, plant-based diets, to eating out more frequently (Ejike & Obeagu, 2018; Searcey & Richtel, 2017). Eating away from home, which is characterised by the consumption of westernised diets that are usually energy-dense but nutrient-poor diets, has been linked to excessive intake of highly processed food and beverage products with excessive calories, fat, and added sugars (Fardet, Anthony, and Edmond, 2020).

This shift in eating patterns has accentuated the dependence on fast foods by many eople. Eating out has now become a fundamental part of consumers' lifestyles and is fuelled by the need for convenience. This has led to a growth in the number of meals taken outside the home with a fifth of all consumers eating out at least once a week. Therefore, these eateries and food retailers contribute substantially to individuals daily caloric intake (Brindal, 2010; Rosenheck, 2008).

2.8 Nutrition Knowledge and Practices of Fast-food Vendors

Several authors have defined knowledge as information that is factual and interpretative, that leads to understanding or is useful in decision making or informed actions (Barbosa et al., 2016). There are two types of knowledge according to cognitive psychology: declarative and processual (Barbosa et al., 2016).

Declarative knowledge is usually the knowledge of facts; it is the knowledge that speaks of 'what is,' for example, the knowledge that oranges are vitamin C-rich fruits or that consuming adequate vegetables and fruits may avert most of the diet-related NCDs.

Processual knowledge however, relates to how actions are undertaken, for example, how to choose between healthier food options or how to prepare a balanced meal (Reicks, 2014; Nickols, 2010).

With regard to food, the primary steps in altering eating behaviour are knowing what one should eat and the awareness of the importance of developing healthy food habits. However, there is a very weak relationship existing between people's knowledge and what they do. Knowledge alone is not enough to arouse change but instead acts as a catalyst when the desire to change is present (Worsley 2002). With all these in mind, nutrition knowledge (NK) may therefore be defined as an individual's cognitive process associated with information on food and nutrition, and it may relate to food selection and success in NCD prevention. An important observation about most studies on fast food operators is that, they mainly focus on food handling techniques that impact on food safety and hygiene. Again, researches into the practices of these vendors mainly target the food handling aspects and its safety. There is therefore paucity of information on food operators' nutritional knowledge and practices.

Most of these fast-food vendors acquire their cooking skills from home and thus have little or no training in nutrition. The few of them who have had training in meal preparation and catering at catering schools barely took courses in nutrition There is therefore a lot of nutritional ignorance and this has fuelled the rapid rise in NCDs. For instance, the excessive use of salt and stock cubes- which contain a lot on monosodium glutamate- has been linked to the increase in the prevalence of hypertension (Matejowsky, 2009), but whether these vendors are aware is not known. The knowledge of these vendors on fruits and vegetables and its impact in the control of NCDs is also unknown.

CHAPTER THREE

METHODOLOGY

3.1 Research Design

A cross-sectional design was employed in this study. This is because the fast vendors are not organized and listed.

3.2 Research Approach

The study used the quantitative research approach, where variables were specific to the objectives and options were given for choices to generate quantitative data.

3.3 Study Sites

The study took place in three (3) suburbs of the Kumasi Metropolitan Area in the Ashanti Region of Ghana. These were Bantama, Suame and Tafo Sub Metro. Fast foods are patronized in urban areas where commercial and professional are intensed. In most of these communities, majority of the households do not cook. Within the Kumasi metropolitan area, Bantama, Suame and Tafo submetro.

3.4 Study Population

The study population were fast-food vendors within the Kumasi metropolis.

3.5 Sampling Technique

Kumasi Metropolitan Area has 10 sub-metros. The study used simple random sampling to select three (3) study sites through blind-folding and balloting of names written on pieces of folded papers. According to the KMA report cited online (http://kma.gov.gh), there were 446 certificated fast-food operators in the three selected sub-metro (KMA,

2021). The selection of the fast-food vendors to be interviewed were due to convenience; as and when there were met at the food base.

3.6 Sample Size Calculation

This was calculated using Yamine's statistical formular (1967) with 95% confidence level

$$n = \left(\frac{N}{1 + N\,(e)^2} \right)$$

Where n=minimum sample size

N= 446 (Population of fast-food vendors at Bantama, Suame, Tafo)

e = 5% (the margin of error)

$$n = \frac{446}{1 + 446\,(0.05)^2}$$

$$n = 210$$

The study selected two hundred and ten (210) participants.

3.7 Data Collection Tools

An online semi-structured questionnaire, developed using google forms, was used to obtain data from the participants. The questionnaire was adapted from similar studies (Khongrangjem et al., 2018) on nutrition knowledge and was modified to suit the objectives of the study. The questionnaire was made up of four sections; socio-demographic details of the participants, nutrition knowledge, diet related NCDs knowledge and cooking practices (Appendix A).

3.8 Pretesting

Pretesting was done to assess the validity of the research instruments in terms of its understanding. The pretesting was conducted at Kwadaso, a sub-metro of Kumasi which has the same characteristics as the study sites. The outcome of the pretesting was assessed and questions that needed amendments were done accordingly. The validity was assessed based on the responses we had from the pre-test. Almost all the respondents gave good responses based on their knowledge.

3.9 Ethical Consideration

3.9.1 Informed Consent

Study participants were approached and the purpose of the research were explained. Those who agreed to be part of the study were given informed consent forms to sign and date. Subsequently, these participants were recruited voluntarily.

3.9.2 Right to Withdraw

Participants were informed about their right to withdraw from the study at any time and this would not affect them in any way.

3.9.3 Confidentiality

Participants were assured of confidentiality and that, their identity would not be disclosed. Again, any information given would be used exactly for the purposes of the study and not contrary. Also, the information would be accessible to only the research team and this information would be discarded appropriately after the study.

3.10 Data Management

Access to data generated from the study was kept under restriction. The digital data was stored on a password-protected laptop and made available only to the research team. Quality assurance protocols as well as all COVID-19 protocols were full observed during the data collection process.

3.11 Data Analysis and Presentation of Results

In assessing the dietary knowledge of respondents, list of questions on food nutrients basic functions of food nutrients, specific food nutrients and the functions and diet related diseases were asked (Appendix A). The answers with 'NO' portrayed no dietary knowledge on the phenomenon under investigation. Equally, most of the 'Disagree and 'Strongly Disagree' were also a sign of low or no dietary knowledge. The data was analysed using descriptive statistics, chi square and the fisher exact tests. Regression using STATA version 4.0 waAs also employed. The outcome was presented in tables and pie charts.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Socio-demographics Characteristics of the Participants

The sociodemographic information of the participants is presented in table 1. A total of 210 participants took part in the study. There were 139 (66.2%) females and 71 (33.8%) males in this study and this is consistent with many studies that had more females in food preparation and vending service, demonstrating that the food local service industry is traditionally dominated by females (Akabanda et al., 2017; Razeghi Fariba et al., 2018). However, some authors reported more males than females in their studies (Razeghi Fariba et al., 2018; Vandana & Kusuma, 2017). More than half (57.1%) of the participants were between the 21-25 years age range, while just about 5% were more than 30 years old. Almost half (47.1%) of the participants were Northerners, about a third (31.9%) were Akans and about a fifth (21.0%) were either Gas or Ewes. More than 80% of the participants had attained pre tertiary education as their highest level of education, with only about 12% being graduates of a tertiary institution. Regarding the participants' marital status, an overwhelming majority (71.4%) were single, a fourth (23.3%) of them were married and about 5% were either divorced or separated.

Table 1: Sociodemographic Characteristics of Participants

	Frequency N =210	Percent (%)
Age		
15-20	21	10.0
21-25	120	57.1
26-30	57	27.1
31+	12	5.7
Sex		
Female	139	66.2
Male	71	33.8
Ethnicity		
Akan	67	31.9
Ewe	17	8.1
Ga	27	12.9
Northerner	99	47.1
Level of Education		
MSLC /JHS	50	23.8
SHS	75	35.7
NVTI	60	28.6
Tertiary	25	11.9
Marital Status		
Divorce	2	1.0
Separated	9	4.3
Married	49	23.3
Single	150	71.4

4.2 Participants' Sources of Nutrition Knowledge

Figure 1 presents the sources of nutrition knowledge of the participants. Half of the participants (37%) received general nutrition knowledge either from family and friends and (14%) from the mass media. Again, 7% sourced nutrition knowledge from dieticians. Just a few (6%) of the participants reported receiving nutrition knowledge solely from a health personnel. About a third (29.0%) of them received nutrition knowledge from more than one source.

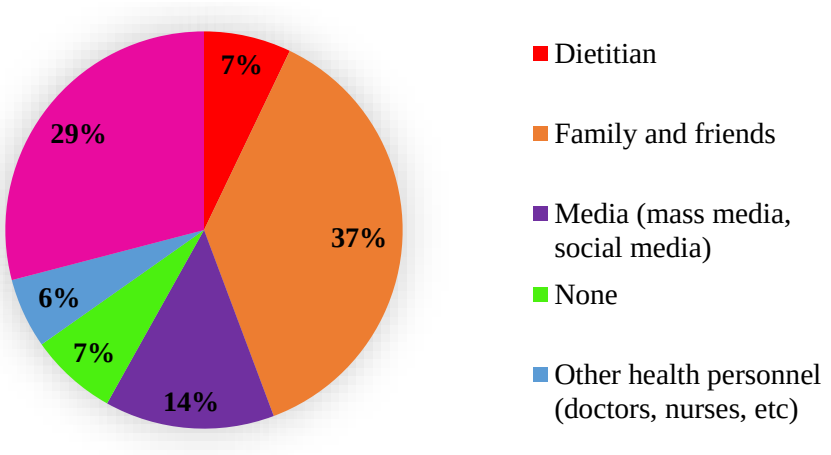

Figure 1: Participants' Sources of nutrition Knowledge

4.2.2 Sources of Acquiring Nutrition Education

Majority of the participants (87.1%) reported having received some form of education in nutrition while in school, with 12.9% receiving no nutrition education in school. Majority (76.3%) of the participants received the nutrition education at the pre-tertiary level and less than 5% received nutrition education in the university as shown on Figure 2. This table implies that majority of the fast food vendors have basic nutrition education at the Senior High School level.

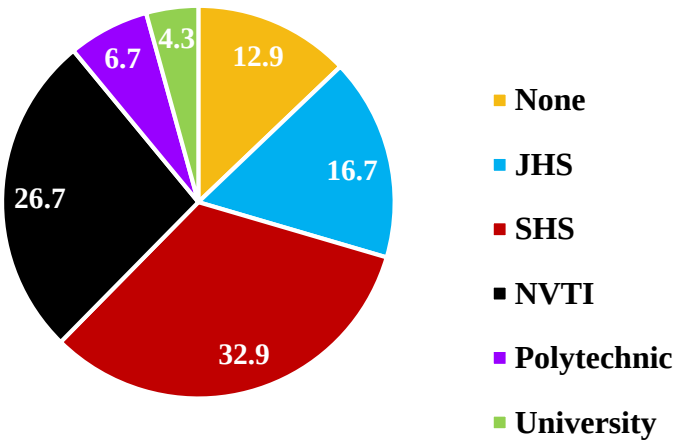

Figure 2: Participants' Sources of nutrition Education in School

4.3 Participants General Nutrition Knowledge

From Table 2 below, over 90% of the respondents agreed that cereals, yam, plantain, bread and spaghetti are good sources of carbohydrate. Majority of the respondents (64.8%) did not agree or were not sure whether adequate fibre intake helps with satiety. About half (51.9%) of the participants erroneously agreed with the statement that fruits and vegetables were not good sources of vitamins, while 11.4% were not sure as they neither agreed nor disagreed with the statement. There was a split when the respondents were asked whether children needed more protein than adults; a little below 50% of the participants agreed to the question, while similar number (43.8%) also disagreed. However, more than 90% of the participants rightfully agreed to the sources of protein, similar to the study by Lessa et al. (2016). The participants did not know the link between iron deficiency and anaemia even though there has been an established relationship between insufficient iron intake and the development of anaemia (Farrukh et al., 2016; WHO, 2017). Most of the respondents in this study were unaware of the link between iron deficiency and anaemia as majority (66.7%) disagreed that lack of iron intake could lead to anaemia.

Table 2: General Nutrition Knowledge of fast-food vendors

Nutrition Knowledge	Strongly disagree n (%)	Disagree n (%)	Neither agree nor disagree n (%)	Agree n (%)	Strongly agree n (%)
5. Cereals, yam, plantain, bread, and spaghetti are good sources of carbohydrates.	5 (2.4)	0 (0.0)	9 (4.3)	64 (30.5)	132 (62.9)
6. Carbohydrate provides the body with energy	5 (2.4)	2 (1.0)	8 (3.8)	66 (31.4)	129 (61.4)
7. Oats, legumes, and green leafy vegetables and fruits are good sources of fibre.	51 (24.3)	38 (18.1)	17 (8.1)	40 (19.0)	64 (30.5)
8.Adequate intake of fibre helps increase satiety	52 (24.8)	54 (25.7)	30 (14.3)	25 (11.9)	49 (23.3)
9. Meat, fish, egg and beans are good sources of protein	5 (2.4)	7 (3.3)	6 (2.9)	57 (27.1)	135 (64.3)
10. Protein helps promote growth	5 (2.4)	8 (3.8)	15 (7.1)	49 (23.3)	133 (63.3)
11. Children need more protein than adults.	44 (21.0)	56 (26.7)	18 (8.6)	34 (16.2)	58 (27.6)
12. Fruits and vegetables are not good sources of vitamins.	48 (22.9)	29 (13.8)	24 (11.4)	36 (17.1)	73 (34.8)
13. Vitamins protects the body against diseases	5 (2.4)	33 (15.7)	15 (7.1)	66 (31.4)	91 (43.3)
14. Kontomire, alefu, spinach, kidney and egg are good sources of iron	36 (17.1)	46 (21.9)	24 (11.4)	49 (23.3)	55 (26.2)
15. Lack of iron causes anaemia	47 (22.4)	93 (44.3)	18 (8.6)	21 (10.0)	31 (14.7)

4.3.1 Nutrition Knowledge Adequacy of the Participants

Table 3 presents the adequacy levels of the nutrition knowledge of the participants. Overall, about half (49.0%) of the participants had inadequate knowledge on nutrition, with just 13 (6.2%) of them having adequate nutrition knowledge. A little above 40% of the respondents had moderate knowledge in nutrition. Even though there is paucity

of literature in the area of general nutrition knowledge of food vendors and handlers, most of the studies on nutrition knowledge of food vendors and handlers (focus on their food safety knowledge) reported mixed results. While some of them concurred with the results from this study (Lessa et al., 2016; Marzban et al., 2020), others reported majority of their participants having adequate nutrition knowledge (Annor & Baiden, 2011; Razeghi Fariba et al., 2018; Lestantyo et al., 2017; Mukherjee et al., 2018). There was a significant difference in the knowledge adequacy between genders, with more males (26.7%) having moderate knowledge than the females (18.1%). A greater number of females (43.8%) than males (5.4%), had inadequate knowledge. Slightly more females (4.3%) than males (1.9%), had adequate nutrition knowledge. Again, there was a significant difference in the knowledge adequacy among the participants' level of education, and half (50.5%) of the participants aged 21-25 had adequate nutrition knowledge. There was also a significant difference observed among the different general sources of nutrition knowledge as well as among the different educational units where nutrition education was received by the participants. Interestingly, for the participants who did not receiving nutrition education from any educational institution, none of them had inadequate knowledge in nutrition, while very few of them who received nutrition education in the senior high school (0.5%), polytechnic (0.5%), and university (1%) had inadequate nutrition knowledge.

Table 3: Adequacy Level of participants' Nutritional knowledge

	Nutrition knowledge classification				
	Inadequate n (%)	**Moderate n (%)**	**Adequate n (%)**	**Total n (%)**	**p- value**
Gender					
Female	92 (43.8)	38 (18.1)	9 (4.3)	139 (66.2)	
Male	11 (5.4)	56 (26.7)	4 (1.9)	71 (33.8)	**0.009***
Total	103 (49.0)	94 (44.8)	13 (6.2)	210 (100)	
Age					
15-20	10 (4.8)	10 (4.8)	1 (0.5)	21 (10.0)	
21-25	78 (37.1)	34 (16.2)	8 (3.8)	120 (57.1)	0.086
26-30	12 (5.7)	43 (20.5)	2 (1.0)	57 (27.1)	
35+	3 (1.4)	7 (3.3)	2 (1.0)	12 (5.7)	
Total	103 (49.0)	94 (44.8)	13 (6.2)	210 (100)	
Level of education					
MSLC /JHS	27 (12.8)	23 (11.0)	0 (0.0)	50 (23.8)	
NVTI	32 (15.2)	27 (12.8)	1 (0.5)	60 (28.6)	
SHS	39 (18.6)	33 (15.7)	3 (1.4)	75 (35.7)	**0.000***
Tertiary	5 (2.4)	11 (5.2)	9 (4.3)	25 (11.9)	
Total	103 (49.0)	94 (44.8)	13 (6.2)	210 (100.0)	
Do you have any knowledge in nutrition?					
No	9 (4.3)	4 (1.9)	3 (1.4)	16 (7.6)	
Yes	95 (45.2)	90 (42.9)	9 (4.3)	194 (92.4)	0.070
Total	103 (49.0)	94 (44.8)	13 (6.2)	210 (100.0)	
If yes what is the source the knowledge?					
Dietitian	1 (0.5)	12 (5.7)	2 (1.0)	15 (7.1)	
Family and friends	28 (13.3)	45 (21.4)	4 (1.9)	77 (36.7)	
Media (mass media, social media)	18 (8.6)	9 (4.3)	2 (1.0)	29 (13.8)	0.195
Not applicable	10 (4.8)	6 (2.9)	0 (0.0)	16 (7.6)	
Other health personnel (doctors, nurses, etc)	7 (3.3)	5 (2.4)	0 (0.0)	12 (5.7)	
More than one source	39 (18.6)	17 (8.1)	5 (2.3)	61 (29.0)	
Total	103 (49.0)	94 (44.8)	13 (6.2)	210 (100.0)	
At what educational level did you receive nutrition education?					
N/A	18 (8.6)	9 (4.3)	0 (0.0)	27 (12.9)	
JHS	10 (4.8)	25 (11.9)	0 (0.0)	35 (16.7)	
SHS	34 (16.2)	28 (13.3)	2 (1.0)	64 (30.5)	**0.014***
NVTI	30 (14.3)	20 (9.5)	1 (0.5)	51 (24.3)	
Polytechnic	11 (5.2)	10 (4.8)	3 (1.4)	24 (11.4)	
University	0 (0.0)	2 (1.0)	7 (3.3)	9 (4.3)	
Total	103 (49.0)	94 (44.8)	13 (6.2)	210 (100.0)	

Data was presented in Chi-square with $p \leq 0.05$

4.4 Participants' Knowledge on Nutrition-related non-Communicable Diseases

The participants' knowledge on nutrition-related non-communicable diseases was evaluated and the results, presented in Table 4. Majority (56.2%) of the participants rightfully disagreed to the assertion that Fat from animal and animal products is good for the human body. Again, about half (56.2%) of the participants agreed that saturated fats from food is linked to the development of cardiovascular diseases; and this link has been established by several studies (Gorski & Roberto, 2015; Gupta et al., 2016; WHO, 2018a).

Interestingly, though fast foods have been known to be a source of high dietary fats and oils and therefore could lead to increased caloric intake (Jahan et al., 2020; Rosenheck, 2008; Searcey & Richtel, 2017), more than half (60%) of the participants did not agree to this. The participants displayed a relatively low knowledge about salt intake and the link to hypertension, as 83.9% indicated there was no link or they were not sure of the link between salt and salty foods intake and hypertension. A little over 60% of the respondents were also unaware that canned foods are high in salt. They also demonstrated their lack of knowledge about the effects of monosodium glutamate (MSG) on health as more than half (71.4%) of them disagreed that monosodium glutamate was not healthy for the body. However, many studies have shown that frequent consumption of MSG is associated with the hypertension and overweight (He et al., 2008; Morita et al., 2021; Shi et al., 2011). and this contradicts the responses given by the respondents. Although several studies have shown the importance of fibre in preventing diabetes and cardiovascular diseases (Alissa & Ferns, 2017; Lie et al., 2018; Threapleton et al., 2013; Wu et al., 2015), slightly more than half (58.6%) of the participants either did not agree or were not sure about that.

Table 4: Knowledge of respondents on Non-communicable Diseases (NCDs)

Statements	Strongly disagree n (%)	Disagree n (%)	Neither agree nor disagree n (%)	Agree n (%)	Strongly agree n (%)
16. About 50% of NCDs are diet-related	78 (37.1)	72 (34.3)	24 (11.4)	20 (9.5)	20 (9.2)
17. Monosodium-glutamate is not healthy for the body	74 (35.2)	76 (36.2)	21 (10.0)	16 (7.6)	23 (11.0)
18. Hypertension is attributed to high intake of salt	65 (31.0)	77 (36.7)	34 (16.2)	26 (12.4)	8 (3.8)
19. Canned foods contain a lot of sodium (salt).	55 (26.2)	70 (33.3)	11 (5.2)	33 (15.7)	41 (19.5)
20. Ketchup are very high in sugar	64 (30.5)	43 (20.5)	21 (10.0)	44 (21.0)	38 (18.1)
21. Fats from animal and animal products is good for the body.	64 (30.5)	54 (25.7)	23 (11.0)	40 (19.0)	29 (13.8)
22. Fats from plant and plant products is good for the body.	86 (41.0)	29 (13.8)	21 (10.0)	45 (21.4)	29 (13.8)
23. Foods high in saturated fats and oil are related to cardiovascular diseases.	36 (17.1)	24 (11.4)	32 (15.2)	81 (38.6)	37 (17.6)
24. Fast foods is a source of high fats and oils.	63 (30.0)	56 (26.7)	7 (3.3)	52 (24.8)	32 (15.2)
25. To prevent HPT and CVDs, the WHO recommends salt intake of less than 6 grams per person per day.	55 (26.2)	53 (25.2)	30 (14.3)	40 (19.0)	32 (15.2)
26. Fibre intake can prevent diabetes and cardiovascular diseases	53 (25.2)	39 (18.6)	31 (14.8)	48 (22.9)	39 (18.6)

*Data was presented in frequency and percentage terms.

4.4.1 DR-NCD Knowledge adequacy of the participants

Table 5 shows the adequacy levels of participants' knowledge regarding Nutrition-related NCDs. Overall, 11 participants, representing 5.2%, exhibited adequate knowledge about diet-related non-communicable diseases. Also, 139 (66.2%) participants had inadequate knowledge about diet-related NCDs. However, there were no significant differences between the sociodemographic characteristics of the participants and their NCDs knowledge adequacy levels. None of the participants with educational level of MSLC /JHS and NVTI had adequate knowledge about diet-related non-communicable diseases. Also, out of the 9 people who received knowledge about Nutrition-related NCDs at the university, majority (5 participants) had adequate knowledge levels.

Table 5: Adequacy Level of participants' NCD knowledge

	Inadequate n (%)	Moderate n (%)	Adequate n (%)	Total n (%)	p- value
Gender					
Female	91 (43.3)	41 (19.5)	7 (3.3)	139 (66.3)	0.285
Male	48 (22.9)	19 (9.0)	4 (1.9)	71 (33.8)	
Total	139 (66.2)	60 (28.6)	11 (5.2)	210 (100.0)	
Age					
15-20	17 (8.1)	4 (1.9)	0 (0.0)	21 (10.0)	0.053
21-25	83 (39.5)	32 (15.2)	5 (2.4)	120 (57.1)	
26-30	33 (15.7)	19 (9.0)	5 (2.4)	57 (27.1)	
35+	6 (2.9)	5 (2.4)	1 (0.5)	12 (5.7)	
Total	139 (66.2)	60 (28.6)	11 (5.2)	210 (100.0)	
Level of education					
MSLC /JHS	45 (21.4)	14 (6.7)	0 (0.0)	59 (28.1)	0.702
NVTI	31 (14.7)	4 (1.9)	1 (0.5)	36 (17.1)	
SHS	54 (25.7)	19 (9.0)	4 (1.9)	77 (36.7)	
Tertiary	9 (4.2)	23 (11.0)	11 (5.2)	38 (18.1)	
Total	139 (66.2)	60 (28.6)		210 (100.0)	
What is the source the knowledge?					
Dietitian	11 (5.2)	0 (0.0)	4 (1.9)	15 (7.1)	0.689
Family and friends	57 (27.1)	20 (9.5)	1 (0.5)	78 (37.1)	
Media (mass media, social media)	26 (12.4)	1 (0.5)	2 (1.0)	29 (13.8)	
None	10 (4.8)	5 (2.4)	0 (0.0)	15 (7.1)	
Other health personnel (doctors, nurses, etc)	10 (4.8)	1 (0.5)	1 (0.5)	12 (5.7)	
More than one source	25 (12.0)	33 (15.7)	3 (1.4)	61 (29.0)	
Total	139 (66.2)	60 (28.6)	11 (5.2)	210 (100.0)	
At what educational level did you receive nutrition education?					
None	14 (6.7)	12 (4.3)	1 (0.5)	27 (12.9)	0.448
JHS	25 (12.0)	10 (4.8)	0 (0.0)	35 (16.7)	
SHS	44 (21.0)	17 (8.1)	3 (1.4)	64 (30.5)	
NVTI	31 (14.8)	16 (7.6)	4 (1.9)	51 (24.3)	
Polytechnic	22 (10.5)	2 (1.0)	0 (0.0)	24 (11.4)	
University	1 (0.5)	3 (1.4)	5 (2.4)	9 (4.3)	
Total	139 (66.2)	60 (28.6)	11 (5.2)	210 (100.0)	

Data was presented in Chi-square with $p \leq 0.05$

4.5 Cooking Practices of Fast-Food Vendors

Participants were asked about their cooking practices and their responses are presented in Table 6. The use of stock cubes in meal preparation has been implicated in the rise in hypertension and related diseases (Niaz et al., 2018; Shi et al., 2011). In this study, more than half (68.1%) of the participants reported of always or mostly adding stock cubes during meal preparations, while 26 (12.4%) use stock cubes sometimes. This was to enhance the taste of the foods to draw more customers since most customers are interested with the taste of the food than other characteristics as asserted by empirical literature (Lessa et al., 2016; Morita et al., 2021; Vandana & Kusuma, 2017). Stock cubes, due to their high levels of sodium, usually monosodium glutamate (MSG), are not recommended for regular consumption, as MSG has the similar effects of increased blood pressures as salt does (Shi et al., 2011). In addition, 72.8% participants reported of always using canned tomato than fresh ones in the preparation of stews and soups. If as high as 68.1% and 72% of fast-food vendors are constantly using MSG and canned tomatoes respectively in food preparation, then consumers are being exposed to a high risk of NCDs and this might have accounted for the surge in NCDs in Ghana in recent years.

In preventing and managing nutrition-related NCDs such as hypertension and diabetes, the WHO has recommended a daily consumption of at least 5 portions of fruits and vegetables (WHO, 2018a). In this study, about half of the participants reported that they do not usually serve adequate cut vegetables (cabbage, lettuce, carrot and cucumber, etc) with meals. It may be due to the high cost of fruits and vegetables and other health and food safety concerns. Fruits and vegetables are the major sources of protective nutrients and play a vital role in reducing the risk of many NCDs hence their role in

daily diet cannot be grossed over. If fast food vendors who have invaded the food market do not provide adequate vegetables to consumers, then the health of consumers are at a risk of NCDs and other immunocompromise diseases.

When asked whether they reuse the same oil several times for deep frying, almost all (90%) of the participants always used the oils several times while just about 4% never reuse the oil. It has been reported that when oils are reused often, they transform into trans-fat, which has been associated with the development on CVDs (Afaneh et al., 2017; Bhardwaj et al., 2016; Brühl, 2014). Several studies however point to the fact that most food vendors reuse oils several times for deep frying, as also observed from this study and this could be harmful to the body (Brühl, 2014; Emelike & Achinewu, 2020).

The study also assessed how chicken is prepared by fast-food vendors. Chicken is a very important part of fast foods in Ghana as many patrons of these foods opt for chicken. Chicken is a good source of protein; however, the skin contains a lot of fat which is unhealthy for the body (Peña-Saldarriaga et al., 2020; Xin, 2013). In the study, 188 (89.5%) participants did not usually deskin the chicken before using for meal preparation.

Table 6: Cooking Practices of Fast-Food Vendors

Cooking practices	Always n (%)	Most times n (%)	Sometimes n (%)	Not often n (%)	Never n (%)
27. I add stock cubes (e.g., royco. maggie,) in meal preparations.	98 (46.7)	45 (21.4)	26 (12.4)	21 (10.0)	20 (9.5)
28. I use polished/ refined rice when cooking rice dishes.	84 (40.0)	39 (18.6)	9 (4.3)	49 (23.3)	29 (13.8)
29. I use more canned tomatoes than fresh tomatoes when I am preparing stews and soups.	74 (35.2)	79 (37.6)	15 (7.1)	23 (11.0)	19 (9.0)
30. I use butter/lard/margarine in food preparation or garnishing.	80 (38.1)	62 (29.5)	15 (7.1)	36 (17.1)	17 (8.1)
31. I serve adequate cut vegetables (cabbage, lettuce, carrot and cucumber, etc) with meals.	12 (5.7)	32 (15.2)	52 (24.8)	84 (40.0)	30 (14.3)
32. I use ketchup and salad cream to serve the food	76 (36.2)	52 (24.8)	23 (11.0)	41 (19.5)	18 (8.6)
33. I use saturated fat/oil for cooking.	11 (5.2)	20 (9.5)	28 (13.3)	98 (46.7)	53 (25.2)
34. I reuse the same oil many times for deep frying.	115 (54.8)	74 (35.2)	6 (2.9)	6 (2.9)	9 (4.3)
35 I deskin the chicken before cooking.	7 (3.3)	9 (4.3)	6 (2.9)	116 (55.2)	72 (34.3)

*Data was presented in frequency and percentage terms.

4.5.1 Participants' usage of the oil overused for deep frying

Figure 3 indicates what the participants do with the oil they used for several deep frying. After severally using the same oil for deep frying, almost all the participants reported that they prepared "shito" or stew with the over-used oil. This further aggravates the concerns of the intake of trans fat since these overused oils are likely to have isomerised into trans-fat. Trans-fat has been noted to, not only increase the levels of the low-density lipoprotein (bad cholesterol) in the body, but also reduces that of the high-density lipoprotein (good cholesterol). These are linked to a higher risk of developing stroke, heart disease and type 2 diabetes.

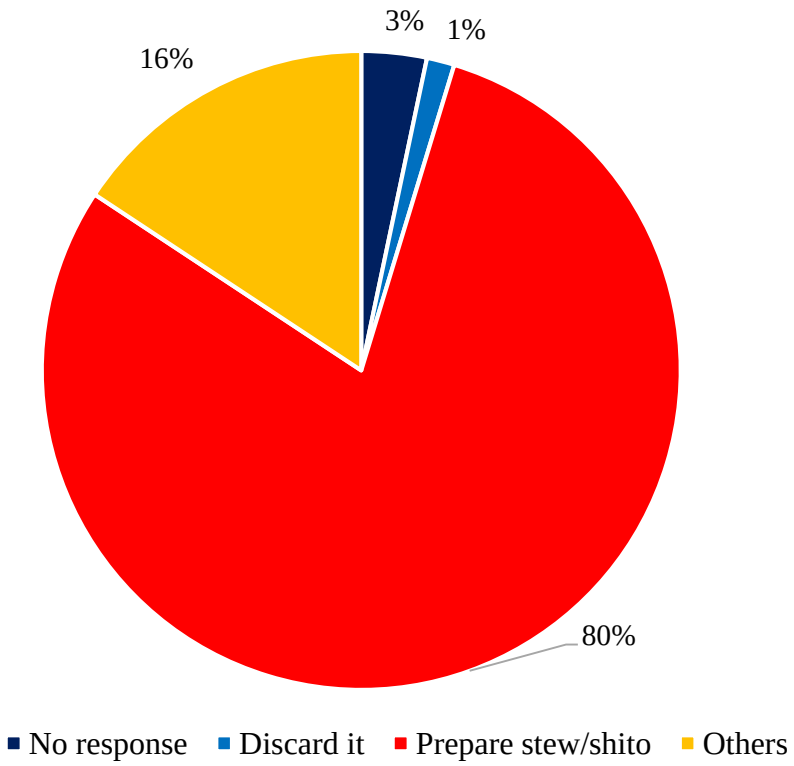

Figure 3: How participants use the overused oil after deep frying.

CHAPTER FIVE

CONCLUSION AND RECOMMEDATIONS

5.1 Conclusion

Majority of the fast-food vendors had inadequate knowledge in nutrition. A significant difference was found between the nutrition knowledge adequacy levels relative to gender and education level of the respondents.

Again, a majority of the participants had inadequate knowledge in diet-related non-communicable diseases (Nutrition-related NCDs), with just a few of them demonstrating adequate knowledge levels. However, there were no significant difference between the Nutrition-related NCDs knowledge adequacy levels of the participants and their socio-demographic characteristics.

Regarding their cooking practices, almost all the participants used the same oil several times for deep frying. Just a few discarded this over-used oil, while majority prepared shito or stew with it. The fast-food providers used high saturated fats as well as high sodium products in meal preparations for consumers and in effect, expose consumers to the risk of the development of Nutrition-related NCDs.

5.2 Recommendations

The following recommendations were made based on the findings from the study;

- Fast-food vendors should limit the use of saturated fats in meal preparation and resort to the use of natural spices in place of the artificial spices such as the stock cubes.
- Also, the Ministry of Education should include nutrition and health as a course in the catering institutions.

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APPENDIX A: RESEARCH QUESTIONNAIRES.

NUTRITION KNOWLEDGE AND COOKING PRACTICES OF FAST-FOOD VENDORS IN KUMASI METROPOLITAN AREA IN GHANA

QUESTIONNAIRE

I am Florence Brenyah, a student of Akenten Appiah Menka University of Skill Training and Entrepreneur Development (AAMUSTED); I am conducting research on the topic "Nutrition Knowledge and Cooking Practices of Fast-Food Vendors in Kumasi Metropolis of Ghana". The information pooled from this questionnaire would be used solely for research purpose and will be kept completely confidential. Kindly therefore provide answers to all the questions to the best of your ability.

This research has three objectives

1. 1.To assess the general nutrition knowledge of fast-food vendors in Kumasi Metropolitan Area.
2. To ascertain the knowledge of fast-food providers on diet-related diseases in Kumasi Metropolitan Area.
3. To identify the cooking practices of fast-food providers in meal preparation for clients in Kumasi Metropolitan Area.

Code Number.....

NB: Please read carefully and indicate your answers in the provided boxes by ticking in box and provide answers where necessary.

SECTION 1: SOCIO-DEMOGRAPHIC DATA

BIO-DATA OF RESPONDENTS

Sex	**Ethnicity**	**AGE**	**LEVEL OF EDU.**
[ ] Male	[ ] Akan	[ ] Below 14	[ ] None
[ ] Female	[ ] Ga	[ ] 15-20	[ ] Primary
	[ ] Northerner	[ ] 21-25	[ ] MSLC /JHS
	[ ] Ewe	[ ] 26-30	[ ] SHS
		[ ] 35+	[ ] NVTI
		[ ]Tertiary	

Marital Status	**Major Previous Employment Category**
[ ] Married	
[ ] Single	[ ] Government Employed-Specify ……
[ ] Separated	[ ] Self-Employed -Specify……
[ ] Divorce	
[ ] Widow	

SECTION 2: KNOWLEDGE ON NUTRITION

1. Do you have any knowledge in nutrition?

   [ ] Yes [ ] No

2. If Yes, what is the source of your nutrition knowledge?

   [ ]Mass media (Internet, Radio, TV) [ ]Friends and Family [ ]Doctor [ ]Dietitian

   [ ] Magazine [ ]None

3. Aside this information on nutrition available to you, have you had any course in nutrition?

   [ ] Yes [ ] No

4. If yes, where? [ ]JHS [ ]SHS [ ] NVTI [ ]Polytechnic [ ]University

Please circle the number for each statement indicating to what extent you agree or disagree with each of the following statements.

Key

1 -Strongly disagree 2 -Disagree 3 -Neither agree nor disagree 4 -Agree 5 - Strongly agree

5. Cereals, yam, plantain, bread, and spaghetti are good sources of carbohydrates.

   1 2 3 4 5

6. Carbohydrate provides the body with energy

   1 2 3 4 5

7. Oats, legumes, and green leafy vegetables and fruits are good sources of fibre.

   1 2 3 4 5

8. Adequate intake of fibre helps increase satiety

   1 2 3 4 5

9. Meat, fish, egg and beans are good sources of protein

   1 2 3 4 5

10. Protein helps promote growth

    1 2 3 4 5

11. Children need more protein than adults.

    1 2 3 4 5

12. Fruits and vegetables are not good sources of vitamins.

    1 2 3 4 5

13. Vitamin protects the body against diseases

    1 2 3 4 5

14. Kontomire, alefu, spinach, kidney and egg are good sources of iron

    1 2 3 4 5

15. Lack of iron causes anaemia

1 2 3 4 5

SECTION 3: KNOWLEDGE ON DIET-RELATED DISEASES (NCDs)

16. About 50% of non-communicable diseases are diet-related?

1 2 3 4 5

17. Monosodium-glutamate is not healthy for the heart

1 2 3 4 5

18. Hypertension can be highly attributed to high intake of salt

1 2 3 4 5

19. Canned foods contain a lot of sodium (salt).

1 2 3 4 5

20. Ketchup and salad cream are very high in sugar which is highly attributable to diabetes

1 2 3 4 5

21. Fats from animal and animal products is good for the body.

1 2 3 4 5

22. Fats from plant and plant products is good for the body.

1 2 3 4 5

23. Foods high in fats and oil are related to cardiovascular diseases.

1 2 3 4 5

24. Fast foods is a source of high fats and oils.

1 2 3 4 5

25. To prevent cardiovascular diseases, the WHO recommends salt intake of less than 6 grams per person per day.

1 2 3 4 5

26. Fibre intake can prevent diabetes and cardiovascular diseases

1 2 3 4 5

SECTION 4: COOKING PRACTICES

Please circle the number for each statement indicating to what extent you agree or disagree with each of the following statements.

Key

1 -Strongly disagree 2 -Disagree 3 -Neither agree nor disagree 4 -Agree 5 - Strongly agree

27. I add stock cubes (e.g., royco. maggie,) in meal preparations.

1 2 3 4 5

28. I use polished/ refined rice when cooking rice dishes.

1 2 3 4 5

29. I use more canned tomatoes than fresh tomatoes when I am preparing stews and soups.

1 2 3 4 5

30. I usually use butter/lard/margarine in food preparation or garnishing.

1 2 3 4 5

31. I serve adequate cut vegetables with meals.

1 2 3 4 5

32. I use ketchup and salad cream to serve the food

1 2 3 4 5

Please circle the number for each statement indicating to what extent you agree or disagree with each of the following statements.

Key

1 - Never 2 - Rarely 3 - Occasionally 4 - Frequently 5 - Very frequently

33. How often do you use saturated fat/oil for cooking?

1 2 3 4 5

34. Do you usually reuse the same oil many times for deep frying?

1 2 3 4 5

35. How often do you deskin the chicken before cooking?

1 2 3 4 5

Please read the questions carefully and indicate your answer below.

36. What do you do with the oil you use for deep frying?

[ ] Prepare stew/shito [ ] Discard it [ ] Others ……

37. Any further comment(s) you want the researcher to know?

……