Food Choice Decision-Making Among School-Going Adolescents Amidst the Nutrition Transition in Urban Accra, Ghana

Krystal Krsna Rampalli

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Food choice decision-making among school-going adolescents amidst the nutrition transition in urban Accra, Ghana

by

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DEDICATION

I dedicate this work to my parents and in loving memory of my dear friend Christopher Heren (23 July 1982 – 3 December 2017). My parents sacrificed much of their lives to ensure I would have as many opportunities as possible to better myself and my future. Their courage in the face of adversity, their selflessness, and their work ethic continue to inspire me. From day one, they have always been dedicated to my professional and personal success and have done all in their power to help me in both material and non-material ways. For those reasons, I dedicate this work to them.

Chris always challenged me to look beyond my own worldview, which is imperative for success in a doctoral program, a research career, and in life. His curiosity about the world, his loyalty to his friends, and his sense of humor were infectious and inspiring. He had always planned to do his own Ph.D. and would have been a fantastic and prolific scholar if it was not for his untimely death. Though his passing was prior to making the life-changing decision to transfer to the University of South Carolina, it made me realize how short life really is and that second chances can be hard to come by, so you should make the most of them when you are lucky enough to get them. Even though Chris is not physically with me on earth, he is always in my heart, and I dedicate this work to him.
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ABSTRACT

Like many countries of the world, Ghana is experiencing a nutrition transition and rising non-communicable diseases. Adolescents are susceptible to diet-related health risks as they experience significant physical and psychological changes, which are happening in tandem with food environment changes, including widespread proliferation of large portion and package sizes of energy-dense, nutrient-poor foods. Both local and multinational food and beverage companies have encouraged consumption of their products through various marketing tactics targeted directly to adolescents. Some of these tactics include the use of characters or celebrity endorsement, promotional discounts, and appeal to sociocultural values, including messages about body size preferences. As a result, adolescents may experience conflicting messages from exposure to Western food marketing campaigns promoting abnormally thin bodies by consumption of foods that are known contributors to obesity and chronic diseases. This qualitative study used in-depth interviews to explore perspectives held by 48 public junior high males and female students in six urban districts of the Greater Accra Region of Ghana, with respect to healthy and unhealthy food, portion sizes, body image, and how advertising messages contribute to their food choice decision-making. The first aim sought to understand how adolescents conceptualize healthy and unhealthy foods, food portion sizes and purchasing behaviors. Students had rudimentary knowledge of nutrition, mostly derived from school curricula. However, their food choices were predominantly driven by attitudes and beliefs held by those in their social networks, cost considerations, and health claims on
advertisements. Students did not fully understand what portion control and mindful eating was, though they recognized moderation as an important health behavior. The second aim sought to uncover perspectives by these same students regarding body image. Younger students and females felt more body image dissatisfaction and desire to change their current weight status. Body image aspirations were important in food choice decision-making; students alluded to people who they sought to emulate. Students discussed tensions with elders about types and quantities of food to eat and the body sizes that their elders wanted them to be versus what they wanted to look like. The results from this study suggest the need for social network and social marketing interventions that could address healthy eating habits, body dysphoria, as well as deceptive marketing tactics used to promote unhealthy foods for both adolescents and their caregivers.
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CHAPTER 1
INTRODUCTION

Non-communicable diseases (NCDs) such as obesity, hypertension, type 2 diabetes, and cardiovascular disease have significantly increased in the last two decades as more low- and middle-income countries (LMICs) undergo rapid economic growth, technological innovation, and globalization of food systems (Blake et al., 2021; Turner et al., 2018; World Health Organization, 2017). These changes have happened in tandem with what Popkin and colleagues refer to as the “nutrition transition,” in which populations shift from diets high in cereals and fiber to diets high in refined carbohydrates, fats, and animal-source foods (Drewnowski & Popkin, 1997; Popkin, Adair, & Ng, 2012). Additionally, the inclusion of high levels of sodium and ultra-processing techniques to enhance shelf-stability and palatability are also characteristic of many foods involved in the nutrition transition (Popkin et al., 2012). Supermarkets, fast food restaurants, casual dining restaurants, convenience stores, and shopping malls have penetrated many urban centers in LMICs, particularly in sub-Saharan Africa, Latin America, and South and Southeast Asia (Anggraini, Febuhartanty, Bardosono, Khusun, & Worsley, 2016; Baker & Friel, 2016; Kroll et al., 2019; Wertheim-Heck & Raneri, 2019). In many urban and peri-urban areas of LMICs, modern retail entities have rapidly eclipsed traditional food outlets, such as the open-air market or corner vegetable stand (Demmler, Ecker, & Qaim, 2018; Wertheim-Heck & Raneri, 2019). This contemporary
food environment offers a vast array of both healthy and unhealthy food and beverage choices for consumers (Turner et al., 2018). With an increasingly large number of options available at countless food venues, determining what to get, for whom, where, why, and how to prepare and eat is no longer a simple decision; in fact, it is quite complex (Furst, Connors, Bisogni, Sobal, & Falk, 1996; Meiselman & MacFie, 1996).

Frequent consumption of high-fat, refined carbohydrate, and sodium-laden foods are known contributors to larger body weights and development of NCDs (Popkin et al., 2012). A population-level effect of the increased intake of such foods has been a coexistence of overnutrition and undernutrition, known as the “double burden of malnutrition.” This phenomenon can be seen across all population groups in developed and developing country contexts (Caleyachetty et al., 2018; Popkin et al., 2012; Prentice, 2006; World Health Organization, 2017). Dietary transitions are concerning for LMICs that lack the healthcare resources to deal with NCDs at the population level (Ford, Patel, & Narayan, 2017).

In recent years, rapid urbanization, nutrition transition, and booming population growth have engendered a rise in obesity and NCDs in sub-Saharan Africa (Bosu, 2015; Steyn & Mchiza, 2014). Ghana, a West African LMIC of approximately 31 million people, is in an intermediate stage of the nutrition transition and has experienced increases in obesity and NCDs over the last two decades (GSS; GHS; ICF International, 2015; GSS and MI, 1994; Laar et al., 2020; World Bank Group, 2020). As of 2016, 43% of Ghanaian adults were classified as either overweight or obese, with higher rates among urban dwellers and women (Ofori-Asenso, Agyeman, Laar, & Boateng, 2016). In response to these alarming rates, the Ghanaian government has tried to persuade people
to consume healthier diets through various health promotion activities, including messages about calorie control and dietary diversity (Ministry of Health of the Republic of Ghana, 2012). These efforts have had limited impact as much of Ghanaian food environments are populated by unhealthy foods containing high levels of refined carbohydrates, saturated fats, and sodium, and there is limited coordination and structure among key policy actors. Further compounding the issue is that there is limited community awareness and readiness to address unhealthy diets and prevention of NCDs among young people (Nyaaba, Stronks, Masana, Larrea-Killinger, & Agyemang, 2020; Pradeilles et al., 2019). Refined carbohydrates, sodium, and saturated fats have been implicated in the widespread development of diet-related NCDs (Kroll et al., 2019; Ofori-Asenso et al., 2016).

In Ghana and in most of Africa, larger body types have traditionally been preferred, particularly for women, and are often associated with affluence, beauty, and health (Duda, Jumah, Hill, Seffah, & Biritwum, 2007; Tuoyire, Kumi-Kyereme, Doku, & Amo-Adjei, 2018). Thinness was believed to reflect poor health, poverty, and specifically in the African context, HIV/AIDS (Coetzee et al., 2012; Prioreschi et al., 2017). In that last three decades, body image concerns have gained attention on the global health stage due to rising rates of overweight and obesity and the challenge of getting individuals to engage in healthier weight control behaviors (Tuoyire et al., 2018). The extent to which health is factored into food choice decision-making in sub-Saharan Africa and the risk for diet-related NCDs is unclear (Okop, Mukumbang, Mathole, Levitt, & Puoane, 2016).

While most studies on obesity and NCDs in LMICs have focused on adults (Bosire et al., 2020; Ford et al., 2017; Gissing, Pradeilles, Osei-Kwasi, Cohen, &
Holdsworth, 2017; McNamara & Wood, 2019; Miranda et al., 2019; Wu et al., 2015), 90% of the world’s approximately 1.2 billion adolescents, ages 10-19, reside in LMICs (Caleyachetty et al., 2018; Nagata, Ferguson, & Ross, 2016; UNICEF, 2019; Vorster, Kruger, & Margetts, 2011). Adolescents are particularly vulnerable to the risks related to consumption of unhealthy diets as they are developing physically, cognitively, and emotionally. They have higher nutritional requirements than adults and studies have shown that adolescence is a critical gateway where people form their lifelong diet and physical activity habits (Black et al., 2013; Das et al., 2017; Salam, Das, Lassi, & Bhutta, 2016). Adolescence is also a stage when identities and values are formed, friends and peers become more influential, and autonomy is often granted from caregivers (Sturdevant & Spear, 2002). This age group may associate personal identity and status with food consumed, and the meanings they attach to particular foods can influence their food choices (Maxfield, Patil, & Cunningham, 2016). The values of autonomy and justice are prominent during these formative years (Bryan et al., 2016). Adolescents tend to be at a point in their life where they may be making more food choices outside of their familiar home environments (Bassett, Chapman, & Beagan, 2008). Studies on adolescents have found that most independent food choices made by this population group occur in contexts outside the home, such as in school, community settings, and during leisure time activities with peers (Amos, Intiful, & Boateng, 2012; Contento, Williams, Michela, & Franklin, 2006).

A common characteristic of the nutrition transition observed worldwide is an increase in the portion sizes of commonly consumed foods, such as packaged snacks (e.g., potato chips, candy bars, sugar-sweetened beverages) as well as in meals consumed
outside the home (Colapinto, Fitzgerald, Taper, & Veugelers, 2007; Livingstone & Pourshahidi, 2014; Sheehy, Roache, & Sharma, 2013). The nutrition transition in sub-Saharan Africa, coupled with the increase in portion sizes and widespread availability of unhealthy foods, has coincided with rising obesity and NCD rates in the region (Kroll et al., 2019; Nnyepi, Gwisai, Lekgoa, & Seru, 2015; Popkin et al., 2012; Sousa et al., 2020). Consuming large food portion sizes and therefore higher energy intakes, contributes to the high prevalence of obesity and NCDs (Livingstone & Pourshahidi, 2014). In Ghana and other LMICs, the widespread proliferation of targeted marketing campaigns toward adolescents by food and beverage corporations has been linked to the rise of obesity among this group (Cassim, 2010; Scully et al., 2012; Smith, Kelly, Yeatman, & Boyland, 2019; Sousa et al., 2020). Several prior studies on food marketing in Ghana suggests that exposure to food and beverage advertisements can influence youth to consume larger food portion sizes (Amevinya & Laar, 2020; Bragg, Hardoby, Pandit, Raji, & Ogedegbe, 2017; Green et al., 2018; Kumi & Laar, 2020; Sheehy et al., 2013; Tsrah & Laar, 2020).

As adolescents are experiencing significant physiological and psychological changes, body image can impact food consumption and mental health. A negative body image is associated with disordered eating behaviors among adolescents (Benowitz-Fredericks, Garcia, Massey, Vasagar, & Borzekowski, 2012; Hassapidou & Papadopoulou, 2006; Okop et al., 2016). In LMICs like Ghana, food and beverage companies often use Westernized marketing strategies, portraying consumers of their product as thin, fit, and “cool” (Amevinya & Laar, 2020; Cervellon & Dubé, 2000; Fouéré et al., 2000; Kumi & Laar, 2020; Tsrah & Laar, 2020). In contrast, adolescents may feel pressured to consume larger portion sizes by their families to match
conventional symbols of African beauty and wealth. With cultural norms normally favoring larger body weights, adolescents may experience cognitive dissonance when exposed to Western food and beverage marketing campaigns that simultaneously promote larger portion sizes and thinner bodies. The conflicting messages between cultural values, Westernized food and beverage marketing, and individual body image perceptions may contribute to the increased consumption of unhealthy foods and ultimately, the rise of obesity and related NCDs (Hoek & Gendall, 2006; Wrigley-Asante, Agyei-Mensah, & Obeng, 2017) and poor mental health outcomes (Nagata et al., 2016; Kelly, Zilanawala, Booker, & Sacker, 2018). In Ghana, there is little known about food choice decision-making among adolescents, particularly the relationships between body image and food portion sizes and the contextual factors associated with the selection and consumption of unhealthy foods.

The purpose of this study is to explore the food choice decision-making processes of urban Ghanaian adolescents. Specifically, this study seeks to understand perspectives held by urban Ghanaian school-going adolescents about different portion sizes of healthy and unhealthy foods and the role of body image perceptions in food choice decision-making. This population was selected for two reasons. First, the global prevalence of child and adolescent obesity and NCDs are on the rise. Second, adolescence is a key life course stage where diet and physical activity interventions could have a significant impact on population health. Third, information about food choices and health outcomes among both adults and children under five are usually accounted for in nationally representative surveys. Granular information about school-going adolescents is often not included in larger scale nutrition studies and surveys.
Obtaining these insights will be valuable as it can help guide the development of future food environment interventions and policies targeted toward adolescents to prevent and control NCDs in LMICs like Ghana. The knowledge gained can help global health practitioners to tailor age- and culturally- appropriate programs and strategies to improve global population health.
CHAPTER 2
BACKGROUND AND SIGNIFICANCE

2.1 Global nutrition transition

In the last 25 years, LMICs around the world have experienced significant economic, demographic, and epidemiological transformations (Popkin, 1994). Alongside those changes have come distinct changes in diets and physical activity patterns. The shift from traditional diets high in cereals and fiber to Westernized diets high in refined carbohydrates, fats, and animal-source foods is a trend that Popkin and colleagues refer to as the “nutrition transition” (Drewnowski & Popkin, 1997; Popkin, 1994, 1998; Popkin et al., 2012).

Popkin and colleagues proposed five basic stages of the nutrition transition (Figure 2.1) (Popkin, 2002, 2006). The first stage is known as the hunter-gatherer or Paleolithic pattern, in which food was collected from wild plants and animals and was generally quite healthy. These foods were high in carbohydrates, fiber, and iron. However, in this era, life expectancies and fertility rates were low due to infectious diseases. The second stage of the nutrition transition can be characterized as a time when famines began to emerge as modern agriculture began to take off. Diets were high in cereals and nutritional deficiencies were common. This was also an era where high fertility, low life expectancy, and high maternal and child mortality existed. The third
stage was marked by industrialization and reductions in famine as incomes rose. Diets were high in starches but lacked nutrient diversity and as such, stunting was common. The fourth stage could be characterized as one where diet-related NCDs, obesity, and disabilities emerged as consumption of processed foods high in added sugars, sodium, and fats increased. Physical activity levels decrease drastically as work and technology shifts to more office-based, sedentary lifestyles. The fifth stage of the nutrition transition is described as one where behavioral and social change begin to emerge to protect against diet-related NCDs and improve quality of life. Such changes involve shift in diets toward decreased consumption of animal-source foods and refined carbohydrates as well as an increased consumption of fruit, vegetables, and fibrous foods, as well as increases in purposeful physical activity. Health outcomes are mostly positive, with increased life expectancies and reductions in obesity and diet-related NCDs.

Popkin and colleagues note two important points in their nutrition transition framework. First, the sequence of nutrition transition stages has already occurred several decades ago in most high-income countries. They also maintain that most developing and developed countries are currently in either the third or fourth stage, and that the final proposed pattern is only present in a few select communities, generally those with higher socioeconomic statuses, within some high-income countries (Popkin, 2006; Popkin et al., 2012).

Urbanization, rising incomes, economic growth, and increased investment in LMICs by multinational corporations, and advancements in technology and modern medicine have also been taking place alongside the nutrition transition. The global middle class, which is rapidly becoming a very large proportion of the world’s population
based in LMICs, is experiencing significant increases in their discretionary incomes and subsequent purchasing power (Fengler & Kharas, 2017; Kharas & Hamel, 2018; Kharas, 2010). With higher disposable incomes, the global middle class is more willing and able to adopt more consumption-oriented lifestyles, including higher selectivity in food and drink (Blake et al., 2021; Hoefel, Kiulhitzan, Broide, & Mazzarolo, 2015; Kharas, 2017).

Figure 2.1. Stages of the Nutrition Transition (Popkin, 2002, 2006)
The changes in food environments, lifestyles, health outcomes, and consumption behaviors that define the nutrition transition has had both positive and negative consequences in LMICs. On the one hand, parents have more resources to provide more diverse diets to their children, something that they themselves may not have had when they were young (Wertheim-Heck & Raneri, 2019). In fact, while it remains an issue of contention, many LMICs have witnessed large reductions in undernutrition and related comorbidities, such as stunting and wasting (Black et al., 2013; World Health Organization, 2017; Young, Nguyen, Tran, Avula, & Menon, 2019). On the other hand, Western marketers have aggressively advertised their unhealthy food products such that LMIC populations gravitate toward Westernized foods, most of which are high in refined carbohydrates, fats, and sodium and associated with the uptick of NCDs worldwide (Grunert, 2006; Neven, Reardon, Chege, & Wang, 2006). Diet-related NCDs are particularly concerning for LMICs that often have limited healthcare capacity and resources to treat and manage those chronic health conditions (World Health Organization, 2017).

2.2 Food environments and the double burden of malnutrition in LMICs

While obesity and NCD rates are increasing rapidly around the world, in the LMIC context, it is occurring at an accelerated pace with rapid urbanization and economic growth compared to high-income countries (Drewnowski & Popkin, 1997; Popkin, 1994). There is a heightened awareness among policymakers and the public health community that health outcomes related to the nutrition transition have ballooned into a serious problem worldwide (Haggblade et al., 2016; Vorster et al., 2011). Specifically, the double burden of malnutrition, in which overnutrition and undernutrition
can co-exist within an individual (e.g., overweight with nutritional deficiencies), community (village, district, national, or regional), or household (e.g., overweight mothers with underweight children), has become a priority on many nations’ policy agendas (Global Nutrition Report, 2018; Turner et al., 2018, 2019; Vorster et al., 2011; Young et al., 2019). According to the 2020 Global Nutrition Report, one in nine people (820 million) are hungry or undernourished, while more than one-third of the world’s adult population is overweight or obese. Although childhood stunting has dropped by 10% from 2012-2018, no country in the world has successfully managed to reverse upward trends of overweight, obesity, and related health problems thus far (Development Initiatives Poverty Research Ltd., 2020). Micronutrient deficiencies, commonly known as “hidden hunger,” are a third malnutrition burden that is gaining more traction in the public health nutrition community as well (Gödecke, Stein, & Qaim, 2018). Globally, all regions are experiencing at least one of the dual burdens (overnutrition or undernutrition), with sub-Saharan Africa facing the highest levels (Development Initiatives Poverty Research Ltd., 2020).

Being on either extreme of the double burden of malnutrition increases the risk of many health problems throughout one’s life (Raphael, 2013; Simmonds, Llewellyn, Owen, & Woolacott, 2016). Undernutrition, stunting, and wasting can lead to reduced cognitive development and suppressed linear growth in childhood and adolescence. Overnutrition, overweight, and obesity can give rise to type 2 diabetes and cardiovascular diseases at younger ages (GBD 2015 Obesity Collaborators, 2017). These poor health outcomes can limit professional, social, and economic opportunities for individuals and families, as well as quality of life. Both undernutrition and overnutrition can increase
one’s risk of early mortality and morbidity across the life course (World Health Organization, 2017). The concurrence of overnutrition and undernutrition is strongly influenced by a multitude of socioeconomic and environmental factors, including maternal education, maternal age, household size, urban-rural setting, water and sanitation access, and household income (Atsu, Guure, & Laar, 2017; World Health Organization, 2017).

Many governments have attempted to bring attention to the effects of the double burden of malnutrition for the masses through various nutrition-sensitive and nutrition-specific programming (Laar et al., 2020). Overall, most efforts have been futile on addressing the overnutrition issue, although several programs have been reasonably successful at combating undernutrition, particularly among mothers and children under five years of age (Bentham et al., 2017; Bhutta et al., 2013; Black et al., 2013).

One of the main reasons that efforts to improve population-level nutrition is so challenging is the fact that food systems and food environments in many LMICs are populated with products containing large quantities of refined carbohydrates, sodium, and saturated fats (Kroll et al., 2019; Ofori-Asenso et al., 2016). The modern retail food environment provides countless opportunities and temptations for the individual to choose (or not choose) to eat certain items. Recent work by the Agriculture, Nutrition and Health Academy proposes a framework that defines the food environment as the “interface where people interact with the wider food system to acquire and consume foods” (Figure 2.2) (Turner et al., 2018). The framework further contends that the food environment is a component of the food system that includes both “personal” and “external” “domains.” The personal domains include an individual or household’s
accessibility, affordability, convenience, and desirability. The external domains are those outside the consumer’s control, and include the availability of the food items, prices, vendor and product properties, and marketing and regulations. This model highlights the food environment as part of the greater food system that connects the supply side to the demand side and the results of those interactions.

Figure 2.2. Conceptual framework of the food environment (Turner et al., 2018)

Much of the food environment research in the last several decades has focused exclusively on high-income countries as the prevalence of diet-related NCDs has been a critical healthcare issue (Turner et al., 2018, 2019). Now that LMICs are experiencing surges of diet-related NCDs, it is important that the implications of the nutrition transition
on food environments are explored to devise meaningful strategies to address population health issues.

2.3 Dietary Acculturation and Consumer Consumption Culture

As the nutrition transition continues to progress in LMICs, the widespread implementation of policies encouraging the development and proliferation of modern food environment fixtures (e.g., supermarkets, fast food restaurants, casual dining, convenience stores) are gradually eclipsing traditional food sources (e.g., wet markets, mobile street vending) (Wertheim-Heck & Raneri, 2019). Concurrently, LMIC consumers, particularly in urban areas, are exposed to vast arrays of information through various marketing promotions, mass media, and communications technologies, many of which use Westernized branding and techniques to influence consumer behavior (Hoefel et al., 2015; Smith et al., 2019). The increased reinforcement within food environments for consumers to adopt Westernized dietary food choices (e.g., unhealthy foods high in refined carbohydrates, saturated fats, and sodium) has encouraged many LMIC dwellers to acculturate to Westernized habits and lifestyles, particularly by altering both diet and physical activity patterns. Dietary acculturation, defined as a process where members of a minority group take up the food choices and eating behaviors of the host country is a key marker of the nutrition transition, as traditional dietary patterns are slowly being replaced by Westernized dietary choices giving rise to diet-related NCDs (Drewnowski & Popkin, 1997; Monterrosa, Frongillo, Drewnowski, de Pee, & Vandevijvere, 2020). Although most studies on dietary acculturation have been conducted among immigrant populations, concepts and practices around dietary acculturation can also be applied to places where
dietary transitions are occurring (Satia, 2010). Some of the factors that influence the process of dietary acculturation and subsequent changes in food choices include: demographic (e.g., age, gender, education, religiosity, household composition, language), social/economic (education, purchasing power, food access and availability, place of residence), ethnocultural norms (e.g., health beliefs, social integration and cohesion, shopping practices, social support), and exposure to host culture (e.g., access to media, peers, access to traditional food sources) (Satia, 2010; Vorster et al., 2011). Dietary acculturation in LMICs has shown to have adverse effects on population health, as the switch to Westernized, energy-dense diets coupled with a reduction in physical activity for work or leisure has engendered changes in health conditions, including rising rates of diet-related NCDs (Satia, 2010).

One of the key downstream effects of the global nutrition transition and increased desire for dietary acculturation is the rise of a consumerist culture, where people place high value in the acquisition of material goods in abundance as a defining feature of their identity (Sobol, Cleveland, & Laroche, 2018; Yamoah, Acquaye, & Alam Malik, 2019). As the global middle class possesses higher discretionary incomes than the prior generations, LMIC consumers are more willing and able to purchase modern goods and services in larger quantities at higher frequencies (Kharas & Hamel, 2018). In fact, a 2015 study on the culture of Brazil’s middle class notes that consumption is viewed by broader society as a proxy that reflects financial and social well-being (Hoefel et al., 2015).

In high-income countries, the nutrition transition can be characterized by larger food portion sizes, high rates of eating outside the home, snacking, as well as a reduced
consumption of water and milk and an increased consumption of sugar-sweetened beverages (Sheehy et al., 2013). LMICs generally are seeing upticks in consumption of animal-source foods and products containing energy-dense sweeteners, including soft drinks, and processed or packaged foods (Perry & Grace, 2015; Satia, 2010).

2.4 Food Portion Sizes

An important food environment factor often overlooked but believed to be a contributor to the obesity epidemic is food portion size, which can be classified under the umbrella of vendor or product properties, as was indicated in the previously described food environment framework (Benton, 2015; Colapinto et al., 2007; Sheehy et al., 2013; Turner et al., 2018). As all countries in the world are in some stage of the nutrition transition, portion sizes of premade foods and beverages (e.g., packaged, ready to eat items, or foods and drinks consumed outside the home) have increased significantly over the last several decades (Yamoah et al., 2019). While portion sizes are generally considered to be a modifiable property of food, they have potential to hold a large influence in the food choice decision-making process. A 2017 Cochrane Systematic Review of 72 studies pertaining to food portion size selection and consumption from 1978-2013 concluded that people tend to consume more food and beverages when they are offered larger portion sizes or packages than when offered smaller portion sizes or packages, with a moderate effect on both adults and children (Hollands et al., 2017).

Larger portion sizes of energy-dense foods that are available in the food environment are an important aspect to consider when trying to understand the genesis of diet-related NCDs in places undergoing the nutrition transition. Much of the recent
evidence on obesity and NCDs have pointed to the concern that exposure to larger portion sizes of energy-dense foods will result in overall higher energy intakes (Almiron-Roig, Forde, Hollands, Vargas, & Brunstrom, 2020; Livingstone & Pourshahidi, 2014; Rosenheck, 2008; Sheehy et al., 2013).

2.5 Nutrition transition and food environments in Ghana

Formerly the British colony of Gold Coast, the Republic of Ghana is a West African LMIC situated slightly north of the Equator on the Atlantic coast. In 1957, Ghana became the first country in sub-Saharan Africa to gain independence from its colonial ruler, the United Kingdom. The current population of Ghana is estimated at approximately 32 million people, with 57% being under age 25 (Central Intelligence Agency, 2021). The average life expectancy at birth is ~69 years old. Health expenditures comprise 3.5% of the nation’s gross domestic product. Ghana’s capital and largest city is Accra and has a population of around 2.56 million. The total population of the Greater Accra Region is approximately 4 million, with an estimated 45% residing in slums and informal settlements. The Greater Accra Region is the center of all of Ghana’s economic activities, which include financial and commercial sectors as well as real estate, fishing, processed food manufacturing, textiles, lumber, tourism, and chemical industries (Central Intelligence Agency, 2021). With the discovery of vast wealth in the form of crude oil and natural gas reserves in Ghana, many multinational corporations from all sectors have either begun to invest or expanded their influence in the country. The economic booms from the natural resource sector have generated many employment opportunities for
Ghanaians and consequently, a large and sophisticated middle class can now be observed in the country (Kroll et al., 2019).

Ghana is in an intermediate stage of the nutrition transition, where obesity and NCDs are expanding as economic growth and urbanization continue (Laar et al., 2021; Oltmans, 2013). The country has experienced large shifts in causes of death from infectious disease to a mixture of both infectious disease and NCDs such as obesity, hypertension, type 2 diabetes, and cancer. The World Health Organization estimates that various NCDs may account for approximately one-third of all deaths in Ghana (Ofori-Asenso et al., 2016; World Health Organization, 2019). As of 2016, 43% of Ghanaian adults were classified as either overweight or obese, with higher rates among urban dwellers and women in the Greater Accra Region (Ofori-Asenso et al., 2016). Nearly one-fifth (19%) of Ghanaians are stunted, an indicator of chronic malnutrition (USAID, 2018).

Ghana’s food system is less advanced than some parts of the African continent, such as South Africa or Kenya, but does have a burgeoning informal sector that focuses on food preservation and processing activities, such as cassava and fish processing, groundnut oil extraction, and milling of various grains. A large proportion of foods and food ingredients available in Ghana, however, are imported from the United States, United Kingdom, China, and Nigeria (Haggblade et al., 2016; Vacu & Odhiambo, 2017). With the increased investment by both local and multinational food and beverage corporations and larger segments of middle-class consumers, Ghana’s urban retail food environment has evolved into a complex array of local, regional, and international cuisine options. For example, there are several Western fast food entities, such as Yum! Brands
(parent company of both Kentucky Fried Chicken® and Pizza Hut®), as well as Burger King® and many others (Searcey & Richtel, 2017). There are also several chop bars (street food outlets), where consumers can find traditional Ghanaian as well as other West African cuisine. Some of the traditional Ghanaian foods commonly consumed include fufu (pounded cassava, yam, and/or plantain), banku (pounded fermented maize) or rice combined with a local meat or fish, and a tomato or pepper-based sauce or stew. There are also many different local snacks easily accessed in street food outlets, including bofrot (e.g., fried doughnut), meat pies, kelewele (spiced fried plantains), roasted plantains, fried yam chips, and meat kebabs. Sugar-sweetened beverages including Coca-Cola and Fanta are widely available, as are local beverages are extremely popular in Ghana, and include sobolo (hibiscus tea), asaana (fermented maize drink), palm wine (Dake, Thompson, Ng, Agyei-Mensah, & Codjoe 2016; Kroll et al., 2019; Mensah, Agboka, & Azilla-Gbettor, 2017; Oltmans, 2013; Rheinländer et al., 2008). Multinational supermarket corporations, such as Shoprite and Game, also provide a variety of modern and traditional food and beverages for consumers to purchase. Lastly, there are numerous ‘mom and pop’ convenience stores, mini markets/roadside stands, traditional open-air wet markets, street food outlets, and many other small-scale venues (Dake, Thompson, Ng, Agyei-Mensah, & Codjoe, 2016; Green et al., 2018; Oltmans, 2013).

2.6 Drivers of food choice and health implications

Consuming food is a necessity for survival, but it is also a complex set of cognitive, emotional, and social processes for an individual. With substantial food choices available in one’s food environment, making choices about what to get, for who,
where, why, and how to prepare and eat is not as simple a decision as it might appear (Furst et al., 1996; Meiselman & MacFie, 1996; Nestle et al., 1998; Sobal, Bisogni, Devine, & Jastran, 2006; Sobal & Bisogni, 2009). Research in food choice has been an area of interest that has spanned several decades over multiple disciplines, including nutritional science, anthropology, psychology and sociology, business and marketing, agricultural and behavioral economics, and food science. Each field offers a different perspective that contributes to the evidence base for public health professionals to devise effective and appropriate interventions (Blake et al., 2021).

Seminal work in food choice research comes from the efforts of a cohort of community health and nutritional science researchers at the Cornell University Food Choice Research Group. Furst and colleagues (1996) developed a conceptual model of the food choice decision-making process after conducting qualitative interviews with adults about their grocery shopping decisions. The framework emphasizes how food choices are made from one’s life course experiences, and they identified five major categories of influences, including cultural ideals, personal factors, resources, social factors, and present context (Furst et al., 1996). The life course perspective that forms the basis for many food choice frameworks encompasses cultural, social, and physical roles, environments, and settings that a person is exposed to, either by their own choice or happenstance, that produce one’s values, ideals, resources, pathways, and contexts by which they exist (Elder, Johnson, & Crosnoe, 2003). The Furst model asserts that a single food choice event can result from a combination of personal and environmental factors that are influenced by one’s life course, and that these decisions could either be mindful
and conscious or automatic and subconscious (Furst et al., 1996; Shepherd & Raats, 2006; Sobal & Bisogni, 2009).

The personal food system is at the core of an individual’s food choice decision-making process. Connors and colleagues (2001) define the personal food system as a series of cognitive processes that people utilize to form their food choices, such as negotiation between food choice values, trade-offs, routines, rules, and priorities amidst the limited time frames they must make the decisions (Connors, Bisogni, Sobal, & Devine, 2001). Sobal and colleagues (2006) expanded on the prior work to include the various fluctuating contexts over time by which food choice decision-making takes place within one’s personal food system. They also emphasize values within one’s personal food system that drive food choices, including perceptions of health, taste, cost, convenience, and many other factors (Sobal et al., 2006). Later, Sobal and Bisogni (2009) constructed the Food Choice Process Model (Figure 2.3). This framework accounted for changes over time within one’s life course trajectory, as well as changes in the personal food system and situations that might affect a person’s food behaviors (Sobal & Bisogni, 2009).

2.7 Food choice schemas and scripts

One of the key conclusions that a quarter of a century of food choice research has uncovered is that an individual’s identity and role within their immediate personal environment (e.g., household, community, social network) plays a vital role in their food choice decision-making process (Bisogni, Connors, Devine, & Sobal, 2002; Sobal et al., 2006; Sobal & Bisogni, 2009). Schema theory is one of several frameworks that
researchers have used to examine variance in food choice decision-making, particularly as it relates to their management of their roles and identities (Blake, 2008; Blake & Bisogni, 2003).

Figure 2.3. Food Choice Process Model (Sobal & Bisogni, 2009)

Food schemas are summarized as “generalized collections of knowledge constructed from past experience that contain domain specific multidimensional, interrelated categories of information that are drawn upon to guide and shape behavior in familiar relevant situations” (Blake, 2008). Some examples of food choice schemas include beliefs or emotions related to specific foods. They can also include specific
situations involving food wherein behaviors or actions are shaped, commonly known as food choice scripts. For example, Blake and Bisogni (2003) qualitatively explored the food choice schemas of rural women in upstate New York and identified five personal food choice schemas and associated scripts, including “dieter,” “health fanatic,” “picky eater,” “nonrestrictive eater,” and “inconsistent eater.” The “dieter” was characterized as someone that admitted to dieting for most of their life and incorporated binging and purging as part of their food choice behaviors, as well as a constant obsession with their weight. The food meanings revolve around seeing food as the enemy, being driven primarily by weight loss or control goals, and feeling guilty about eating. The corresponding food choice scripts were to subject themselves to starvation, binging and purging, caloric restriction, and weight loss diet planning. In contrast, those participants who identified with the “picky eater” schema found themselves believing that their personal eating habits were “unhealthy,” “strange,” or “abnormal,” as well as feeling guilt or self-conscious about eating and getting angry if other people tried to persuade them to eat something. The typical food choice scripts seen for the “picky eater” schema include eating only familiar or preferred foods, avoiding food consumption in front of their children, not trying new foods, or eating in others’ homes. The researchers also identified specific family food choice schemas. For example, a “struggler” placed meaning in their primary concern to obtain adequate food for their household, while at the same time feeling inadequate or unable to allocate resources toward food procurement and preparation. In contrast, a “peacekeeper” family food choice schema could be characterized as having a primary concern of preventing discord within the home and placing others’ wants and needs above theirs. The associated scripts include
accommodating the needs and desires of others, attending to own needs after everyone else’s needs and wants to have been met, and providing alternatives to current food options. Lastly, sometimes people have differing food choice schemas for themselves and their families and will make food choices in different ways as a result. For example, a “healthy eater” personal schema individual might still feed their children junk food, identifying their family food choice schema as the “peacekeeper” and wanting to avoid conflicts between family members about meal allocations (Blake & Bisogni, 2003).

From their qualitative work on food choice schemas, Blake and Bisogni (2003) developed a conceptual model (Figure 2.4) to explain the linkages between current life circumstances, food meanings (as hierarchical organized beliefs and emotions), and food choice scripts, and how those cognitive processes lead to what is manifested as food choice behaviors. The schema model offers an integration of the cognitive processes that are enmeshed in food choice decision-making.

2.8 Eating episodes

Food choice behaviors happen as a direct result of personal and family food choice schemas and scripts, which are influenced by current circumstances, including resources, social context, personal factors, and life course experiences (Blake & Bisogni, 2003). In most high-income countries, social, gender and work roles have changed significantly in the last fifty years. For example, as more women seek higher educational and occupational opportunities, working and eating outside the home has become commonplace while the regularity of sit-down family meals has waned. As a result,
routine food choice decision-making, often done in various times and places throughout one’s day, may change depending on the situation (Bisogni et al., 2007).

Figure 2.4. Conceptual model for the role of food schema (Blake & Bisogni, 2003)

Situational eating is closely related to prior work on consumer behavior, which identifies five key groups which characterize a situation: physical surroundings, social surroundings, temporal perspectives, task definition, and antecedent states (Belk, 1975; Bisogni et al., 2007). A 2007 study which looked at different ways that eating contexts were described by people included how they defined a meal (e.g., a planned occasion with a social component and a specific sequence of dishes) compared to a snack (e.g., an unplanned occasion without a sequence of dishes and usually consumed alone) (Bisogni et al., 2007). Through 24-hour dietary recalls, field notes, and interview transcripts, the researchers were able to identify and understand the contexts wherein eating or drinking
was happening, including day and time, venue of consumption, presence or absence of social contact, and other factors. What they found was that eating and drinking behavior was commonly characterized with differing labels that denote time, location, setting, emotion, satiety, and recurrence of the practice. For example, “breakfast” or “lunch” was perceived to be a habitual mealtime behavior that was performed at either home or work with neutral emotions, and “dinner” was done at home and evoked stronger feelings which could be either positive or negative (e.g., thoughts of having a family dinner together). From their results, they devised a conceptual framework to show eight distinct eating and drinking episodes and how they were defined within a particular circumstance (Figure 2.5).

Figure 2.5. Framework of eight interacting dimensions and features of eating and drinking episodes (Bisogni et al., 2007)
2.9 Other conceptualizations of food choice decision-making

Researchers from other institutions have also conceptualized food choice decision-making processes through various lenses. For example, Contento’s (2011) food choice model is adapted from Bronfenbrenner’s Ecological Systems Theory model but emphasizes an individual’s personal characteristics, including their biology and food experience (e.g., taste preferences and sensory factors) as key determinants in food choice behaviors (Bronfenbrenner, 1979; Contento, 2011). Infant and young child feeding research found that food choice decisions made by caregivers can influence food choices made throughout one’s life (Birch, Savage, & Ventura, 2007). Other food choice research among marginalized populations has found that energy-dense foods are commonly chosen for consumption by lower socioeconomic status groups due to the perception of value for money (Drewnowski & Specter, 2004).

2.10 Food choice behaviors in LMIC contexts

In LMICs, the seminal work done on the drivers of the food choice decision-making process is still largely applicable. People in LMICs are influenced by cultural values and social norms, as well as cost, convenience, taste, health, prestige, and many other factors that were identified by prior food choice research in HICs (Furst et al., 1996; Sobal et al., 2006; Sobal & Bisogni, 2009).

The modern retail food sector in most LMICs has influenced food choice behaviors for LMIC consumers by offering consumers a large variety of food and beverage choices, and particularly packaged and ultra-processed, energy-dense, and nutrient-poor foods and beverages (Demmler et al., 2018; Popkin, 2014; Vorster et al.,
The rise of supermarkets and other modern retail food outlets in LMICs have both advantages and disadvantages. For example, modern retail food outlets are extremely beneficial in that they provide an array of fresh and nutritious foods, many of which are imported from all corners of the globe and cater to a range of palates. Supermarkets and other modern retail food outlets also provide an appealing modern ambiance to LMIC consumers with their bright lights, loud sounds and displays, self-service personality, and advertisements using popular culture icons who are actively endorsing food and beverage products (Bragg, Eby, Arshonsky, Bragg, & Ogedegbe, 2017; Cassim, 2010; Demmler et al., 2018; Hoefel et al., 2015). As a result, these food environments tend to be very appealing to consumers.

Although many of the urban poor in LMICs lack the financial resources to regularly shop at supermarkets, the rapidly expanding middle class of consumers is often very willing and able to shop in those outlets. They often tend to favor modern retail food sources over traditional food outlets for several reasons (Wertheim-Heck, Raneri, & Oosterveer, 2019). First, supermarkets and other modern retail outlets tend to offer more guarantees of food safety, which is a serious consumer concern amplified by the popular media in many LMICs (Wertheim-Heck & Raneri, 2019). Second, consumers enjoy the opportunities that supermarkets and other modern retail food outlets provide in terms of a wide variety of products of differing quality, convenience, and pricing (Oltmans, 2013). Third, the vast amount of convenience foods available in supermarkets helps to alleviate the effects of time scarcity seen in LMICs as more and more women seek career opportunities outside the home and are unable to provide elaborate, home-cooked meals daily (Baker & Friel, 2016; Jabs & Devine, 2006; Prescott, Young, O’Neill, Yau,
Stevens, 2002). Other reasons for the high favorability of supermarkets and modern retail food outlets include the economies of scale that these channels can exploit (e.g., offering bulk quantities of non-perishable and heavily processed foods at cheaper prices) (Demmler et al., 2018).

The major downside of supermarkets and other modern retail outlets is that they also tend to offer an overwhelming selection of ultra-processed and unhealthy foods. In fact, many studies over the last decade have found that supermarket shopping has been closely associated with higher obesity, NCDs, and other poor health outcomes. A panel data study looked at supermarket and modern retail outlet food shopping, food choices, and nutritional outcomes among Kenyan consumers, finding that as the amount of modern retail food outlets continue to proliferate, there were significant increases in energy consumption, particularly from dairy products, edible oils, processed meats (e.g., sausages, bacon, etc.), and other ultra-processed foods (breads, noodles, packaged snacks, soft drinks, etc.). These food items present excessive amounts of macronutrients, including refined carbohydrates, saturated fats, as well as sodium, while concurrently decreasing intake of micronutrients and dietary fiber (Demmler et al., 2018). These are also foods and food ingredients that have been implicated in rising obesity and NCD rates globally.

The changing retail food environment in LMIC urban centers has been implicated in the variability and shifting of dietary patterns associated with the nutrition transition, particularly among children and adolescents (Laar et al., 2021; Ogum Alangea et al., 2020). For example, a 2018 cross-sectional study by Ogum Alangea and colleagues used seven day food frequency questionnaires to assess dietary patterns among school-going
children in urban Ghana. The researchers found four key dietary patterns that accounted for 53.2% of dietary variation: 1) energy-dense, 2) starchy root staple and vegetables, 3) cereal-grain staples and poultry, and 4) fish and seafoods. The energy-dense meal pattern, which includes high consumption of processed meats, fried foods, and sugary foods, was immensely popular and was linked to the rising rates of childhood obesity after controlling for age, gender, family socioeconomic status, and school type. This contrasts with the starchy root with vegetables dietary pattern, which was closely associated with a lower body weight, higher socioeconomic status, and private school attendance (Ogum Alangea, Aryeetey, Gray, Laar, & Adanu, 2018). Various studies on food environments in urban Africa, including urban Ghana and Kenya, have also found that processed and ultra-processed foods are embedded in everyday life, particularly in low-income or deprived neighborhoods where people have quick meals (thirty minutes or less), usually outside the home for breakfast and lunch eating occasions. The most popular foods included convenience food items that were energy-dense, nutrient-poor items, such as sugar-sweetened beverages, confectionary, and fried foods. Most consumed three meals per day, with the evening meal generally consumed at home (Fernandes, Folson, Aurino, & Gelli, 2017; Green et al., 2018; Holdsworth and Landais, 2019; Holdsworth et al., 2020; Laar et al., 2019).

2.11 Food and beverage marketing and food choices

Food and beverage companies conduct their own critical research into drivers of food choice as they seek to gain a more comprehensive understanding of consumer behavior and preferences to design and sell their products. Historically, most market
research on the drivers of food choice among consumers has addressed four critical parameters: product (e.g., packaging and branding), price, place (e.g., both access and availability), and promotion (how the seller communicates the benefits of purchasing their product) (Grunert, 2006). Over the years, market research has also found that consumer demand for food and beverages are largely rooted in perceptions of food quality that are either intrinsic or extrinsic, and lead to a decision-making process that seeks to reconcile perceived benefits versus tradeoffs. Some of the numerous considerations that consumers may make food choice tradeoffs on include taste, cost, health value, food safety, convenience, prestige/status, affiliation, or reward; these aspects are in direct alignment with the seminal food choice models that have been proposed by various nutrition and health researchers (Bisogni et al., 2007; Connors et al., 2001; Contento, 2011; Furst et al., 1996; Shepherd & Raats, 2006; Sobal & Bisogni, 2009; Wilson, 2002). Knowing the factors that influence food choice decision-making has equipped food and beverage marketers with the information to design and present appealing packaging, branding, advertising, distribution channel positioning, and labeling styles for the specific segments of the market they are targeting (Esch, Langner, & Redler, 2004; Grunert, 2002, 2006).

Food and beverage marketing has been shown unequivocally to influence consumers to purchase their products. Traditionally, television, radio, print media and environmental placement of marketing communication materials (e.g., billboards) have been used as platforms to convey product information. As technology and communication media advances, however, marketers have begun utilizing modern information platforms through computer networks, including websites (e.g., YouTube), social media (e.g., Facebook), or mobile phone applications (Coates, Hardman, Halford, Christiansen, &
Advertising campaigns are meticulously designed to target consumers based on specific characteristics, such as age, gender, ethnicity/race, or socioeconomic status and strive to build brand loyalty (Esch et al., 2004; Hoek & Gendall, 2006; Kopelman, Roberts, & Adab, 2007; Truman & Elliott, 2019). Brand loyalty is described as two-fold: the consumer consistently purchases products from a specific company or brand over time and possesses a positive opinion toward the seller. In essence, the customer cultivates a personal attachment to the brand, company, or product as it is believed to fit their personality or self-image or help them achieve a desirable goal (Quester & Lim, 2003).

The modern retail food and beverage sector has magnified in LMICs due to globalization of food systems and liberalization of economies. Specifically, mass marketing campaigns and direct investment by multinational food and beverage corporations have influenced consumer food choice in these regions and led to what is now observed as the nutrition transition (Delobelle, 2019; Popkin et al., 2012). With improvements in infrastructure in LMICs, more sophisticated supply chains for food and beverage distribution have become possible. These developments have enabled multinational food and beverage corporations to make their products more available, accessible, affordable, and acceptable across the globe (Delobelle, 2019). Recent content analyses on food and beverage advertisements in LMICs have found that over half of the ads that were presented were for unhealthy foods, including desserts, sugar-sweetened beverages, and fast foods (Bragg, Hardoby, et al., 2017; Kelly et al., 2013). Additionally, during peak television viewing times, researchers found at least three times as many ads
for unhealthy foods and beverages as for healthy foods and beverages (Borzekowski & Pires, 2018; Delobelle, 2019; Kelly et al., 2013).

Exposure to junk food advertisements is a potent force in driving unhealthy food choices through two important pathways. First, many viewers may not fully understand the persuasive intent of the seller and the truth about the nutritive value of the food or drink promoted. This is particularly a common concern in junk food advertising to children (Boyland et al., 2016). Second, marketing techniques such as captivating jingles, catch phrases, and use of famous models and celebrities are employed to make the food alluring and cater to identities and aspirations of the common consumer. According to Fieldhouse (1996), advertisements use “powerful symbolic meanings of foods, so that what is being sold is not just a product, but a lifestyle, a dream, a source of emotional fulfillment” (Burd, 2018; Fieldhouse, 1996).

Regardless of direct exposure to junk food marketing in the media or environment, studies have shown that people tend to prefer unhealthy foods to healthy foods. For example, a review found that despite the high nutritive value of fruits and vegetables, they were generally seen as tasteless, boring, and dated. In contrast, unhealthy foods were seen as tasty, interesting, and modern, and requested more often when given meal options (Pollard, Kirk, & Cade, 2002). These ingrained food beliefs pose some challenges for public health practitioners as they try to promote healthier diets and lifestyles. A 2016 review article further found moderate quality evidence that unhealthy food and beverage marketing can influence dietary intakes and preferences for energy-dense, nutrient-poor food products (Sadeghirad, Duhaney, Motaghipisheh, Campbell, & Johnston, 2016).
2.12 Food and beverage marketing in LMICs

A high social desirability to emulate Western cultures has been suggested as an important driver of consumption of energy-dense, nutrient-poor foods among many LMIC consumers (Hoefel et al., 2015; Javalgi & Grossman, 2016; Maxfield et al., 2016; Regmi & Gehlhar, 2001). These food choice aspirations are believed to be derived from Westernized food and beverage marketing campaigns in LMICs that have been widely displayed on print and digital media, in and around schools, and within the local food environment (Bragg, Hardoby, et al., 2017). A food and beverage marketing content analysis of digital advertisements found that many Westernized techniques were being employed in China, Mexico, India, and Philippines (upper and lower-middle income countries), including visual portrayals of people with the specific food and/or beverage items, use of charity logos or references, references to exercise or physical activity, ads specifically targeting children (e.g., those containing images of children of similar ages, cartoon characters, or words easily understood by children, etc.), product promotions (e.g., discounts or sales), or symbols that contain strong cultural significance (Bragg, Eby, et al., 2017). Furthermore, endorsement of food by professional athletes, a common Western marketing technique, has influenced food purchasing decisions for LMIC consumers (Bragg, Eby, et al., 2017; Bragg, Hardoby, et al., 2017; Dixon et al., 2010).

2.13 Body image and food choice

Many food and beverage marketing communication materials portray people who are not representative of what an average person’s body may appear. The term “body image” has been used in the health research community to describe an individual’s...
internal perception of their own body shape, size, or other features of their external appearance (Benowitz-Fredericks et al., 2012; Dotse & Asumeng, 2014). Both male and female models in advertisements are usually shown as thin, fit, and attractive, which are characteristic features of Westernized beauty ideals. Furthermore, the images are often manipulated further with airbrushing or photographic editing to make them further flawless to consumers (Belitz & Frank, 2010). An association has been found between body image dissatisfaction among both sexes and the presentation of idealized figures in popular media, including advertisements (Barlett, Vowels, & Saucier, 2008; Grabe, Ward, & Hyde, 2008).

Mass media is a rich source of information for people to learn about the idealized body shape that is culturally acceptable as well as assisting the individual in the formation of their personal body image. Particularly in advertising, media messages stress the importance of appearing attractive to others and demonstrate what one might consider aspiring to look like. In that process, marketers convey that the products they are selling would help the consumer achieve the look that is being portrayed in the advertisement. Since many body image ideals portrayed in popular media are unrealistic for the average person to achieve, continued exposure to popular media is an established risk factor for body dissatisfaction and poor mental health (Kelly, Zilanawala, Booker, & Sacker, 2018; Marengo, Longobardi, Fabris, & Settanni, 2018).

Seminal research in body image perceptions and disordered eating posits that there are two distinct aspects that are related to body image attitudes. The first is the individual’s actual perception and evaluation of their external appearance. The second is the value they place in their appearance and subsequent amount of investment they would
put into changing their appearance (Cash, 2011). The extent to which the former influences the latter can be significant, depending on the individual and their own values, beliefs, and cultural environment.

2.14 Body image perceptions in sub-Saharan Africa

Historically in much of sub-Saharan Africa, larger body size was believed to be the ideal, particularly for women. Overweight or obese was thought to signify affluence, beauty, and health and/or fertility, while thinner sizes were associated with poverty and disease (Cohen, Boetsch, Palstra, & Pasquet, 2013; Duda et al., 2007; Wrigley-Asante et al., 2017). For instance, a study on South African obese girls found that larger body sizes were preferred and believed to help the individual to participate in laborious tasks and appear respectable (Puoane, Tsolekile, & Steyn, 2010).

In recent years, the traditional body image ideals in Africa have been challenged (Gitau, Micklesfield, Pettifor, & Norris, 2014a, 2014b). The value placed upon stoutness appears to be slowly changing as younger people, particularly females, are experiencing increased exposures to the opposing Western ideas about beauty and attractiveness through various mass media platforms (Cohen et al., 2013; Gitau et al., 2014a, 2014b). There is some evidence suggesting that through the media, people have become more conscientious of the negative health consequences that can potentially stem from overweight and obesity, which has motivated some to keep lower weights (Wrigley-Asante et al., 2017).

While the increased favorability of slimmer bodies in Africa may appear to be a promising sign in the effort to curb diet-related NCDs, there may be a potentially serious
unintended consequence: disordered eating (Gitau et al., 2014b, 2014a). Most food and beverage promotional materials in popular media show people who have achieved the Westernized beauty ideals, which can potentially affect how people view and appreciate their own bodies. Disordered eating occurs when the individual realizes that they cannot possibly achieve the body shape or size that is favored in the images they are presented with and internalizes negative feelings about themselves (Andrist, 2003). In general, body size dissatisfaction and disordered eating behaviors are more characteristic in females than in males, and typically in younger population groups rather than older population groups. Although eating disorders are associated with young females from Western countries, studies in South Africa and Ghana have suggested that the prevalence may be increasing among non-Caucasian and younger populations as more are being exposed to idealized Western body images within their food and community environments through globalization (Caradas, Lambert, & Charlton, 2001; Duda et al., 2007; Gitau et al., 2014b, 2014a; Wrigley-Asante et al., 2017).

2.15 Adolescence

Adolescents (ages 10-19) are a vulnerable population that make up approximately one-sixth of the world’s population (UNICEF, 2016; World Health Organization, 2014). While this proportion differs across regions, it is estimated that 90% of the 1.25 billion adolescent girls and boys live in LMICs in sub-Saharan Africa and South Asia (UNICEF, 2019).

The period of adolescence is characterized by numerous physical, cognitive, and emotional changes. It is a time in life that raises many risks, but also presents great
opportunities for impacting the health and livelihoods of the future (Kleinert & Horton, 2016). Of paramount importance in personal growth for adolescents are the establishment of self-identity, peer-acceptance, autonomy (particularly from parents and caregivers) (Bassett et al., 2008). and a sense of justice. Cognitive processes change from more concrete to abstract reasoning, and the formation of values and morals occurs (Bryan, Yeager, & Hinojosa, 2019; Bryan et al., 2016; Sturdevant & Spear, 2002). Throughout this phase of rapid emotional and physical growth, commonly referred to as puberty, both girls and boys have higher nutritional requirements (Barooah, 2012; Kleinert & Horton, 2016; UNICEF, 2016). Adolescent girls in LMICs are especially more susceptible to morbidities stemming from nutritional deficiencies due to cultural and gender norms that limit their access to healthy food, education, and professional development opportunities (UNICEF, 2019). As a result of limited access to healthy diets, maternal and child health in LMICs is often compromised (Black et al., 2013; Patton et al., 2016; Salam, Das, et al., 2016).

The most common nutritional deficiencies that LMIC adolescents face is iron, calcium, iodine, and folate (Salam, Hooda, et al., 2016). Iron, the most prevalent of all global nutritional deficiencies, is indispensable in maintaining blood health, particularly for young women who have begun menses. Prolonged iron deficiencies can lead to a reduction in oxygen delivery to tissues throughout the body, a condition known as anemia. Anemia is very closely associated with pallor, fatigue, intellectual disabilities, weaknesses, brittle hair and nails, and shortness of breath (Bailey, West, & Black, 2015; Beard, 2000). For women of childbearing age, maintaining adequate iron stores in the body is of utmost importance as a significant amount of blood is lost during childbirth.
and smaller amounts lost during monthly menses. Various studies have shown a link between iron-deficiency anemia during pregnancy and altered fetal outcomes, including low birth weight, intrauterine growth retardation, cognitive deficits, cardiovascular disturbances, and metabolic abnormalities (Abu-Ouf & Jan, 2015; Bailey et al., 2015; Beard, 2000; Black et al., 2013; Das et al., 2017). Calcium is critical for linear skeletal growth, and during puberty, most of the bone formation occurs as the efficiency of calcium absorption increases (Committee on Nutrition, 1999; Results UK, 2016). Iodine, a fundamental component of thyroid hormones, is a common insufficiency in LMICs that can have dire effects on the brain during growth and development, both inside and outside of utero. Adolescents with iodine deficiency disorders are on average, 13.5 IQ points below their peers who are not deficient (Li & Eastman, 2012). Folate and its synthetic analog, folic acid, is an essential nutrient imperative for women of childbearing age, as it plays a significant part in DNA synthesis, repair, and cell division. The most pressing need for folate among women of childbearing age is for protection against neural tube birth defects, which occur within the fourth week of gestation, often prior to the mother’s knowledge of the conception (Lassi, Moin, Das, Salam, & Bhutta, 2017).

While the causes of malnutrition are complex, the United Nations Children’s Fund (UNICEF) proposed a conceptual framework (Figure 2.6) through which this might occur (UNICEF, 1990). Many nutritional interventions in global health would likely follow at least one of the pathways highlighted in this framework.

As the diagram indicates, the most distal causes of malnutrition are lack of economic resources, which serves as a proxy for poverty. Consequently, LMICs suffer most of the brunt of micronutrient deficiencies globally (Bailey et al., 2015; Black et al.,
The evidence surrounding the links between maternal pre-conception health and a child’s future health and the intergenerational, cyclical nature of malnutrition are compelling and unequivocal (De-Regil, Harding, & Roche, 2016; Lassi et al., 2017; Sivagurunathan, Umadevi, Rama, & Gopalakrishnan, 2015).

Figure 2.6. Conceptual framework for drivers of malnutrition (UNICEF, 1990)

An undernourished mother is likely to have a low birth weight child with suboptimal nutritional status and poor development. Over time, this child will grow into
an adult who is nutritionally disadvantaged and have a child who followed the same pattern, thus propagating the cycle. Additionally, an undernourished mother herself is at high risk of having childbirth complications (Coffey, 2015; Patton et al., 2012; Salam, Das, et al., 2016). Adolescents and adults who grew up with nutritional insufficiencies often have a reduced academic achievement and capacity for work due to both physical and cognitive impediments. This in turn leads to reduced income, productivity, and compromised livelihoods, thus making the link between malnutrition and poverty (Bailey et al., 2015; Black et al., 2013; Lassi et al., 2017; UNICEF, 1990).

In the global health sector, most nutritional interventions have been directed towards pregnant and lactating women and babies in their first one thousand days of life, while adolescents have been neglected (UNICEF, 2016). While pregnant and lactating women and babies under age five are extremely important and should be adequately addressed in global health, there is a growing movement to prioritize adolescent health as well (Johnson & Moore, 2016; UNICEF, 2019). Considering that many adolescents in LMICs, particularly girls, are required to adhere to cultural and familial norms of marrying young and starting families (De-Regil et al., 2016; Rani et al., 2013; Sivagurunathan et al., 2015). The World Health Organization reports that approximately 21 million girls ages 15-19 years old in LMICs and 12 million of them give birth, and an additional 777,000 births that happen to adolescents under age 15 (World Health Organization, 2020a). The prevalence of child and adolescent overweight and obesity has risen from 4% in 1975 to 18% in 2016, making this a very concerning issue (Bentham et al., 2017).
Based on the current figures regarding adolescent health in LMICs, more work must be done to improve the nutritional status of this vulnerable population. Understanding the food choice drivers of this population would provide crucial information to devise interventions that would improve adolescent health around the world.

2.16 Adolescent food choice decision-making

Much of the pivotal work in food choice research has focused on adults and their food choice schemas and scripts, and how their personal life course experiences and values might influence the diets they adopt for themselves and in many cases, their families (Bisogni et al., 2007; Blake & Bisogni, 2003; Connors et al., 2001; Furst et al., 1996; Sobal & Bisogni, 2009). The small but growing body of literature on adolescent food choice decision-making is becoming more and more important as adolescents hold a significant share of the population in LMICs.

The food choices that adolescents make are shaped by several factors, some that are similar to adults and others that are not. Children and adolescents are significantly influenced by their personal and external food environments (Story, Neumark-Sztainer, & French, 2002; Turner et al., 2019). For example, adolescents may choose to consume specific foods that they saw advertisements for on a television show that all their friends watch. In contrast, their older parents may not watch that television program or feel the need to emulate their peers. The contexts in which adolescents make food choices are somewhat different than adults, as they often incorporate school and other community settings favored by juveniles, such as movie theaters and shopping malls (Chacon, Letona, Villamor, & Barnoya, 2015; Holsten, Deatrick, Kumanyika, Pinto-Martin, &
Compher, 2012a; Rathi, Riddell, & Worsley, 2016, 2017). Furthermore, as adolescents are in a state of transition from childhood to adulthood, some food choice decisions may be either in concordance or discordance with what they have eaten in their home food environments (Holsten et al., 2012a).

Adolescents often make food choices through consideration of how their image may be perceived by others including their peers and community members. For example, a couple of studies in LMICs have found that adolescents were actively avoiding healthy foods for fears that their peers would bully them for eating “weird” foods or that they would “look poor” (Brown, Shaibu, Maruapula, Malete, & Compher, 2015; Maxfield et al., 2016; Verstraeten et al., 2014). Children and adolescents are often able to influence the food purchasing decisions by adults in many LMIC households (Wertheim-Heck & Raneri, 2019). For example, a qualitative study in urban Gaborone, Botswana found that parents often felt pressured to buy junk foods for their children even though they did not necessarily support it because they did not want their children to feel left out or ostracized at school (Brown et al., 2015). In China in the mid-1990s, McDonald’s was able to market fast food successfully to families by leveraging the influence of the one-child policy on family and social structures. It advertised their restaurant as the proper place where a “Little Emperor” could and should eat at, and therefore, the entire family must join in as well (Watson, 1997). Lastly, as communications technologies and media access are becoming more and more commonplace, meaning that information about food, culture, and society are easily accessible to the masses. Older children and adolescents tend to be more cognizant to the “latest” and “greatest” products of globalization and as such, aspire to be a part of the Westernized consumption-oriented lifestyles that they see
on television and social media as a marker of their own social class (Baker & Friel, 2016; Liechty, 2006; Maxfield et al., 2016; Story et al., 2002). Maxfield and colleagues (2016) found that adolescents in peri-urban India assign the highest prestige to non-traditional and foreign foods that can be purchased and eaten outside their homes. These foods included pizza, instant noodles, sugar-sweetened beverages, ice cream, and cakes, all of which are high in refined carbohydrates, fats, and/or sodium. The lowest prestige was assigned to fresh fruits and vegetables, yogurt, rice, and pulses (Maxfield et al., 2016).

Interestingly, a study on children and adolescents in Nepal found that they would often crave Westernized foods and try to emulate those lifestyles that they have seen on mass media marketing campaigns to give them a snapshot into how they believe more affluent people live like (Liechty, 2006). Further studies contend that people with higher socioeconomic statuses in LMICs demonstrate either implicit or explicit approval for global brands, portraying them as status symbols and cultural norms (Üstüner & Holt, 2010). Assigning prestige to non-traditional foods is also common among rural children and adolescents, who wish to emulate their urban counterparts within the same country (Maxfield et al., 2016). Unlike cost, availability, access, and other economic drivers of food choice, sociocultural drivers of food choice such as food prestige and perceived social class and role in society can take several generations to alter.

Adolescents may also be more inclined to make their food choices based on the idealized body image that they seek to achieve (Andrist, 2003; Cash, 2011; Hassapidou & Papadopoulou, 2006). In sub-Saharan Africa, prolonged and intensive exposure to Westernized beauty ideals and gradual devaluation of traditional beliefs regarding stoutness in popular media and in food and beverage advertisements may pave the way
for adolescents in that region of the world to develop disordered eating behaviors and body image dissatisfaction (Gitau et al., 2014b, 2014a; Puoane, Fourie, Tsolekile, Nel, & Temple, 2013; Wrigley-Asante et al., 2017). Currently, the extent to which body image perceptions influences the quantity and quality of adolescent food choices amidst the nutrition transition in LMICs is not well understood.

A prior conceptual framework by Story and Alton (1996) (Figure 2.7) describes the macro-level and micro-level forces that influence adolescent girls’ food choice behaviors and health status. This framework includes aspects of “macrosystems,” including socioeconomic and political systems, food systems, food availability, and the media, which directly feed into factors at the environmental level (e.g., micro-environmental and immediate social environments) and personal level (e.g., cognitive-affective, behavioral, and biologic). Micro-environmental aspects include cultural group, social/cultural norms and values, food trends, fast foods, and school meals. Aspects of the immediate social environment include family unit characteristics, parenting practices, parent modeling, home environment, family meal patterns and peer norms and influences. Cognitive-affective aspects include an individual’s personal health, values, and beliefs, as well as the functional meanings they associate with foods, body image, and self-concept. Behavioral aspects include food preferences, self-efficacy, food-related skills (e.g., cooking), and eating practices. Biologic aspects comprise of growth, pubertal status, physiologic needs, genetic predisposition, and health status. Both environmental and personal levels influence one another, which then can influence the lifestyle of the individual. An individual’s lifestyle includes their food choice behaviors. Ultimately, those behaviors can affect one’s nutritional status (Story & Alton, 1996).
Figure 2.7. Conceptual framework of adolescent food choice behaviors (Story & Alton, 1996)
2.17 Gaps in the literature

In conducting the literature review for the proposed study, we found that multiple burdens of malnutrition and the rapid development of NCDs in countries such as Ghana have been closely related to significant changes in food availability within food environments that have engendered dietary transitions, particularly in urban centers like Accra. We also found that across sub-Saharan Africa, body image aspirations are important sociocultural drivers of food choice, with a traditional emphasis on larger body sizes. Diets characteristic of the nutrition transition have enabled individuals and communities to access larger portion and package sizes of energy-dense, nutrient-poor foods. Consuming these foods could potentially lead to larger body sizes and subsequently, diet-related NCDs.

A key gap in the literature pertains to the fact that adolescents are an understudied population group in global health, despite comprising a large share of LMIC populations. To create sustainable programs and policies that empower people to adopt healthier food choice behaviors, we must first understand perspectives held by the beneficiaries. In this case, adolescent perspectives on healthy and unhealthy eating, including their understanding of portion control and mindful eating, are unknown in the Ghanaian context. We also do not currently know what adolescents’ perceptions of ideal body size, how those perceptions relate to their food choices and eating patterns, and the extent to which the current marketing techniques employed by food and beverage companies are influencing the quantity and quality of various foods chosen for consumption by this population. Knowing these perspectives are important, as adolescents are in the process
of cementing habits and preferences that can have implications for their own health well into the future (Patton et al., 2016).

To inform the approach for this research study, an adapted version of Story and Alton’s model was developed to account for various contextual factors unique to Ghana as derived from the literature (Figure 2.8). In this model, we retained some aspects of the macro-level forces, including food systems, media, and socioeconomic/political context. However, Ghana is a rapidly urbanizing LMIC undergoing the nutrition transition more broadly, which would constitute macro-level forces (Laar et al., 2021; Pradeilles et al., 2019). Furthermore, many multinational corporations are investing heavily in LMICs such as Ghana, which can affect the types of foods being sold in the local food environments (Holdsworth & Landais, 2019). Story and Alton described micro-level forces that affect an individual’s lifestyle, including environmental and personal dimensions. In this model, micro-level forces include the availability and access to foods within the local food environment and the influence of advertising tactics. Adolescents exposed to their local food environments regularly make decisions based on what they experience against the backdrop of their knowledge, attitudes, and beliefs about food (Laar et al., 2021; Watts, Lovato, Barr, Hanning, & Mâsse, 2015). Characteristics of the home and school environments play some role in how students make food choice decisions (Bauer, Nelson, Boutelle, & Neumark-Sztainer, 2008; Fernandes, Folson, Aurino, & Gelli, 2017; Holsten, Deatrick, Kumanyika, Pinto-Martin, & Compher, 2012b; Story et al., 2002). Cultural norms, traditions, and popular media are important components that adolescents experience that could positively or negatively affect their body image and subsequent food choice decision-making processes as well (Bosire et al.,
Under personal characteristics, many aspects from the Story and Alton model were retained, including self-efficacy, body image aspirations, preferences, genes, pubertal status, and overall health status (Bibiloni, Pich, Pons, & Tur, 2013; Cohen et al., 2013; Das et al., 2017). Social status aspirations were added because in many LMICs, food plays a role in the broader aspirations of individuals, particularly adolescents (Maxfield et al., 2016).
Figure 2.8. Proposed Conceptual Model, adapted from Story and Alton (1996)
2.18 Specific Aims and Research Questions

The study described in the following chapters addresses some of the knowledge gaps regarding drivers of adolescent food choice during such critical years of growth and development in Ghana, a country whose food environments are rapidly changing on the global stage. There are two specific aims in this research:

**Specific Aim 1:** To explore perspectives held by urban Ghanaian adolescents regarding healthy and unhealthy food and connections made to portion sizes, by answering:

- **Research Question 1.** How do adolescents define healthy and unhealthy foods?
- **Research Question 2.** How do adolescents define healthy and unhealthy food portion sizes?
- **Research Question 3.** In what settings or contexts are different healthy and unhealthy food portion sizes consumed?
- **Research Question 4.** What are the reasons that adolescents provide for selection of varying portion sizes of healthy and unhealthy foods?

**Specific Aim 2:** To investigate body image perceptions among urban Ghanaian adolescents and how those perceptions influence their food choice decision-making processes, by answering:

- **Research Question 1.** What are the general attitudes and perceptions about body image among urban Ghanaian adolescents?
- **Research Question 2.** What is the influence of friends/peers, family, and schools on how adolescents perceive their bodies?
**Research Question 3.** Do adolescents consider their physical appearance when making decisions about consumption of various portion sizes of healthy and unhealthy foods? If so, how?

**Research Question 4.** How do body image perceptions vary by gender and by age?
CHAPTER 3
RESEARCH DESIGN AND METHODS

This study used semi-structured, in-depth interviews with public junior high school students (ages 14-17). Information regarding the study setting and study design for the parent project will be described first. Following that, the study design, sampling and recruitment procedure, and analytical strategy for both manuscripts will be described.

3.1 Study setting

The Measurement, Evaluation, Accountability, and Leadership Support for Non-Communicable Disease Prevention (MEALS4NCDs) Project is the parent study from which data collection activities were conducted through. MEALS4NCDs was led by faculty and staff at the University of Ghana, School of Public Health, Department of Population, Family, and Reproductive Health (Laar et al., 2021).

The setting for this study was public primary and junior high schools in six districts/municipalities of the Greater Accra Region of Ghana, West Africa. A map of Ghana is provided (Figure 3.1). The Greater Accra Region is in the southeastern part of the country along the Atlantic Ocean coast. It is the smallest region of the country, occupying approximately 1.4% of the total land area but is the most urbanized part of the country with 87.4% of people residing in urban areas. As of 2019, the estimated population of the Greater Accra Region is 4.94 million, making it the second most
A total of 200 public basic (e.g., primary and junior high grade levels) schools from six administrative districts of variable urbanization (e.g., rural, peri-urban, and urban) and poverty levels participated in this study (Figure 3.2) (Ohene-Adjei et al., 2017). The districts were chosen as a representative sample of the Greater Accra Region through both probabilistic and non-probabilistic sampling approaches, as detailed in a prior article (Laar et al., 2021).
3.2 Study design for parent study

The MEALS4NCDs Project was a cross-sectional mixed-methods study with the intention of generating evidence to support food environment interventions and policies that would reduce consumption of unhealthy foods and beverages in the Greater Accra Region. Examples of such policies and interventions include regulation of the sales of unhealthy food and beverages to children and adolescents within and around school zones or incentivization of healthy food purchases while simultaneously disincentivizing unhealthy food purchases. Using modules from the International Network for Food and Obesity/NCDs Research Monitoring and Action Support, MEALS4NCDs sought to benchmark various aspects of food environments, such as food promotion, in the Greater Accra Region (INFORMAS, 2021). Typical data collection activities for the project included advertisement and food vendor outlet mapping within 250 meters of public...
school zones, monitoring of television advertisements, interviewing of school officials, collecting supermarket inventories, and conducting supermarket shopper exit interviews. Considering that school-going adolescents spend substantial amounts of their days in and around the school food environment, it was important to gather information about the types of foods and related promotions occurring in these settings. Prior studies on food purchasing by basic school pupils in both public and private schools in the urban Greater Accra Region found that the most common venues where children accessed food (either full meals or snacks and drinks) included at the school canteen, private stores, school stores, or tabletop vendors (Fernandes, Folson, Aurino, & Gelli, 2017; Ogum Alangea et al., 2020). It was noted in one of the prior studies that the types of foods and beverages sold by merchants within and outside the school environment were placed in the following categories: ‘meals’; ‘packaged snacks/biscuits’; ‘local snacks (roasted plantain/corn/nuts, etc.)’; ‘fried foods’; ‘pastry’; ‘sweetened/non-fizzy drink’; ‘fizzy drinks’; ‘confectionery/sweets (toffees/candies/lollipops/ice cream)’; ‘kebabs’; ‘fruits’; or ‘fruit juices’ (Ogum Alangea et al., 2020).

Further in-depth information about the MEALS4NCDs Project protocol, including data collection activities and analysis methods, can be found in prior documentation (Laar et al., 2021).

3.3 Study and sampling design for current study

This study used qualitative in-depth interviewing to collect data on students’ experiences and perspectives on food and food choice behaviors within various food environments in the Greater Accra Region of Ghana. A semi-structured interview guide
containing potential probes was created to facilitate this process. In-depth interviewing was a beneficial research design as it provided a more in-depth understanding of the perspectives of an understudied population group (in this case, school going adolescents) about health, nutrition, and factors influencing food choice behaviors that may not be as straightforwardly obtained through quantitative tools (Gill, Stewart, Treasure, & Chadwick, 2008; Patton, 2015). The interview guide had three sections: (1) food literacy, food choice behaviors, and portion sizes, (2) body image perceptions and food choices, and (3) reactions to food and beverage advertisements and perspectives on food environments (Appendix A).

The interviewers for each study site were either site supervisors or research assistants with prior experience in qualitative research methods. Training was provided training to each interviewer on the aims of this study, including application of the interview guide and appropriate probing. As Ghana is currently in the process of developing and validating food-based dietary guidelines containing recommended portion sizes of common foods, the existing Australian Food Guide and modeling clay were used in the first section of the interview guide as visual props to guide students in the discussion about eating habits and portion sizes (Aryeetey, 2020; Australian Bureau of Statistics, 2014; Herforth et al., 2019). The Australian Food Guide was favored over other portion size estimation aids as their images of food were simple and amorphous, easy for the student to understand, and well suited to the appearance of various local Ghanaian foods, particularly rice and other starchy staples. No quantitative dietary assessments were performed.
In the second section of the interview, students were asked questions about the influence of body image perceptions on their food choices. A figure rating scale (Figure 3.3), based on previous work by Stunkard and colleagues (1983) and validated for use in the African context, was incorporated to facilitate discussion about body image (Ettarh, Van de Vijver, Oti, & Kyobutungi, 2013; Okop et al., 2016; Stunkard, Sorenson, & Schulsinger, 1983). Weight and height measurements of students were not collected. Later, students were asked about who or what influenced their body image perceptions, the role of food in body image satisfaction or dissatisfaction, and reasons for wanting to attain or maintain a specific body size or shape. Lastly, the interviewer had a conversation with the student about the influence of food advertising tactics and their local food environment on their food choices.

Figure 3.3. Figure Rating Scale (Ettarh et al., 2013; Okop et al., 2016)
The final section of the interview included discussions with the student about how they interpreted the messages about body image conveyed in example food and beverage advertisements. Each student was shown 2-3 different print food and beverage product advertisements, which were collected from the six most commonly occurring Ghanaian food television advertisements that were monitored in the parent study. The food company advertisements used were: Indo Foods (Indomie® instant noodles), Fan Milk International (various ice cream and frozen dairy confections), Nutrifoods International (Royal Perk!® biscuits and baked goods), Bel Beverages (water, soft drinks, energy drinks), and First Grade International (Koko® coconut milk products) (Appendix E).

3.4 Recruitment and sampling procedure

A purposive sampling frame was applied to select interview participants. The parameters used to recruit students for interviews was in accordance with maximum variance sampling and included sex, age, observed body weight, and school size (defined as number of students per school). We used the Ghana Education Service 2018 public junior high school enrollment figures (roll size) estimates to plan how many students would be interviewed per district (Ghana Education Service Information Management System, 2018; Laar et al., 2021). Districts in the Greater Accra Region with smaller roll sizes had less students interviewed than districts with larger roll sizes. One male and one female student were interviewed in each of the 24 schools, for a total of 48 interviews.

Upon receipt of ethical approval, MEALS4NCDs staff recruited students through direct recommendation by school headmasters (or their designees) who were interviewed
separately about school food provisioning by the MEALS4NCDs staff per the main study protocol (Laar et al., 2021). The objectives of the interview and nature of questions were provided to the school official, as well as the eligibility criteria and the need for a diverse sample using the aforementioned factors for maximum variation sampling. Study information sheets containing staff contact information and consent forms were provided to school officials (Appendices B and C). Upon providing consent for the student to participate, the school official identified two students (one male, one female) from their school whom they believed would be suitable to participate in the interviews. The study team requested for the school headmaster to identify students who were able to confidently express their thoughts and ideas in English, were outgoing around strangers, were free at the time of interview during the school day and met the other maximum variation sampling parameters of differing observed body weights and ages (student was to be under 18 years old).

The interviewer read the assent form aloud and the student was allotted opportunities to ask questions or obtain clarification on any concerns. Students were informed that they would not be subject to any penalties should they choose to end their interview participation early, and that they did not have to answer any questions that gave them discomfort. Prior to the interview commencing, the interviewer requested the student’s signature on the assent form (Appendix D).

While the original plan was to obtain parent or caregiver consent for students to participate in the interviews, due to the COVID-19 pandemic, there were numerous logistical challenges such that the study team determined it would be best to minimize exposure and infection risk for all parties involved. Thus, an amendment was submitted
to the University of Ghana and the University of South Carolina research ethics boards to approve for the school headmasters or their designees to provide adult consent in lieu of the student’s caregivers.

Digital voice recorders were used to capture responses from students. A lapel microphone was provided by the lead researcher (KR) to the student to wear during the interview. Interviews were conducted the same day that consent was obtained from school officials in a quiet area of the school (e.g., empty classroom) and adhered to strict COVID-19 safety protocols required by the Ghanaian government, including wearing of face masks and social distancing. To provide a comfortable space for the student to freely talk to the researchers, all interviews were conducted on the school property without the school staff or other students present.

While the lead researcher (KR) was a foreigner, the interviewer who engaged with the students was always a local Ghanaian member of the MEALS4NCDs study team, who could take the cultural and social context into consideration when phrasing the questions appropriately to the students. Additionally, the interviewer spent approximately ten minutes prior to the interview conversing with the student about topics of interest such as sports or music to build rapport. Throughout the entire interview, the interviewer would use member checking to paraphrase or summarize the student’s statements and would ask them to confirm the accuracy of understanding. Interviews were conducted in English and lasted between 45 minutes to one and a half hours.

To assist with data triangulation later, the lead researcher (KR) made field notes on student and interviewer behaviors and contextual considerations during the dialogues.
Each student who completed the interview received a MEALS4NCDs-branded study t-shirt, face mask, or notebook as an incentive. Audio files were downloaded onto a secure external hard drive as well as stored on Dropbox, with access granted only to specific parent study team members on a case-by-case basis. The recordings were subsequently deleted from the recorders after they were saved in the secure locations.

3.5 Data analyses

Interviews were transcribed verbatim, de-identified, and checked for accuracy by the lead researcher (KR). Transcripts were uploaded into NVivo 12 qualitative software to aid in data management and analysis (QSR International Pty Ltd, 2018). Analysis was inductive and thematic and done in three stages. First, open coding was used by creating categories from the first five transcribed interviews of high quality (as determined by the lead researcher (KR)’s field memos on each interview) (Corbin & Strauss, 2007; Creswell, 2012; Maxwell, 2013; Raskind et al., 2019). After the first five transcripts were coded, the codes were reviewed by the other investigators for suitability and rigor. Keeping the specific aims of the study in mind, the researchers came to an agreement about appropriate initial categories. A codebook was created using the initial categories, and extra codes or categories were frequently added or revised from the remainder of the transcripts in an iterative process. The next phase involved axial coding where concepts and categories were grouped into thematic maps to uncover relationships between ideas presented in the data. Lastly, selective coding was employed to pull all the themes and
ideas together into a coherent story (Corbin & Strauss, 2007; Creswell, 2012; Raskind et al., 2019).

Throughout the coding process, the sociocultural and environmental context from which the students’ perspectives emerged were considered. Credibility of interpretation was strengthened by engaging the interviewers in helping to review and revise the lead researcher (KR)’s field memos as needed, member checking with the student during the interviews, and peer debriefing by presenting results to MEALS4NCDs colleagues and other outside food choice researchers (Bisogni et al., 2002; Lincoln & Guba, 1985).

3.6 Ethical approval

This study was approved by the University of Ghana Institute of Statistical, Social and Economic Research’s Ethics Committee for the Humanities (protocol #128/19-20) and the University of South Carolina’s Institutional Review Board (protocol #PRO00097113).

3.7 Funding statement

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CHAPTER 4

“THEY WANT YOU TO BE FAT… IT MEANS THEY’RE FEEDING YOU WELL”:
A QUALITATIVE INVESTIGATION OF BODY IMAGE AND FOOD CHOICE DECISION-MAKING AMONG JUNIOR HIGH SCHOOL STUDENTS IN THE GREATER ACCRA REGION OF GHANA

1 Rampalli, K.K., Blake, C.E., Frongillo, E.A., Erickson, K.C., & Laar, A. To be submitted to Body Image
4.1 Abstract

Background: Ghana is no exception to global trends of nutrition transition and rising non-communicable diseases (NCDs). Adolescents are susceptible to diet-related health risks as they experience significant physical and psychological changes. With urbanization and development, this population is increasingly exposed to promotion of body size ideals incongruent with traditional standards. Concurrently, adolescents tend to consume unhealthy diets linked to development of obesity and NCDs. The purpose of this study was to understand how attractiveness and body image are conceptualized among this population and how various cultural messages from friends/peers, family, and the media regarding body image influence their food choice behaviors.

Methods: Forty-eight in-depth interviews were conducted with public junior high school students in six districts across the Greater Accra Region of Ghana in July and August 2020. All interviews were conducted in English, audio recorded, and transcribed. Thematic analysis was performed using a constant comparative method.

Results: Participants described attractive and unattractive characteristics, and most participants aspired to change their figures. All students talked about the importance of reaching or maintaining a certain body size to attract romantic partners, reduce physical limitations, and avoid social stigma. To achieve their desired body size or emulate people whose bodies they admire, most participants admitted to changing their food choices. Finally, students mentioned conflicting opinions about ideal body size and appropriate diets with elders, discussing how they are “pressured” to eat larger portion sizes or different foods than they would personally prefer.
Conclusion: Conceptualizations of attractiveness and ideal body size among adolescents in the urban Ghanaian context were influenced by both traditional African and modern values, which stem from messaging within social networks (friends, peers, family) as well as popular media. Future interventions could consider social marketing campaigns using celebrities to promote nutritious diets and physical activity, reduce stigma about both larger and smaller body sizes, and instill confidence in adolescents regarding their body image.

4.2 Introduction

According to the World Health Organization, the prevalence of obesity among adults has tripled since 1975 across the globe (Di Cesare et al., 2016; World Health Organization, 2020). Those numbers continue to rise as many low- and middle-income countries (LMICs) undergo rapid economic growth, social and technological change, and globalization of food systems (Bentham et al., 2017; Blake et al., 2021; Kroll et al., 2019; Turner et al., 2018). Increased body weight is a known contributor to diet-related non-communicable diseases (NCDs), including type 2 diabetes, hypertension, cancers, and cardiovascular disease (Bosu, 2015; Popkin, 2014; Popkin, 2015; Popkin, Adair, & Ng, 2012; Steyn et al., 2014). Considering that many LMICs have limited capacity to adequately address the consequences of diet-related NCDs among their population, it is important that the scientific, medical, and public health actors focus on developing policies and programs geared toward diet-related NCDs prevention (Allotey, Davey, & Reidpath, 2014; Ford, Patel, & Narayan, 2017; Haque et al., 2020; Kankeu, Saksena, Xu, & Evans, 2013).
Sub-Saharan Africa is not immune from the rising global burden of diet-related NCDs (Bosu, 2015; Gouda et al., 2019; Haggblade et al., 2016; Vorster, Kruger, & Margetts, 2011). Over the last three decades, the region has experienced significant urbanization, expansion of the middle class, and modernization of food environments, all of which have fueled the climbing NCD incidence (Demmler, Ecker, & Qaim, 2018; Ford et al., 2017; Popkin et al., 2012; Poti, Mendez, Ng, & Popkin, 2015). Women, children, adolescents, and lower income individuals are often more vulnerable to health risks associated with unhealthy diets (Branca, Piwoz, Schultink, & Sullivan, 2015; Holdsworth & Landais, 2019; Ozodiegwu et al., 2019; Pradeilles et al., 2019). The scientific community maintains that sedentary lifestyles, overeating, and widespread proliferation within the food environment of processed and ultra-processed foods high in refined carbohydrates, sodium, and saturated or trans fats contribute to weight gain and diet-related NCDs development (Haggblade et al., 2016; Monteiro et al., 2019; Popkin et al., 2012; Steyn & Mchiza, 2014).

While most studies on obesity and diet-related NCDs in LMICs have focused on adults and children under five years of age, 90% of the world’s 1.2 billion adolescents reside in LMICs (Bentham et al., 2017; Black et al., 2013; Caleyachetty et al., 2018; Di Cesare et al., 2016; GBD 2015 Obesity Collaborators, 2017; Ozodiegwu et al., 2019; Vorster et al., 2011). Adolescents are particularly vulnerable to the risks related to consumption of unhealthy diets as they are developing physically, cognitively, and emotionally. They have higher nutritional requirements than adults, and adolescence is a critical gateway where people form their lifelong diet and physical activity habits (Bauer, Nelson, Boutelle, & Neumark-Sztainer, 2008; Das et al., 2017; Verma, Paul, Paul,
Sheikh, 2014). Adolescence is also a stage when identities and values are formed, friends and peers become more influential and autonomy is often granted from caregivers (Bryan, Yeager, & Hinojosa, 2019; Sawyer et al., 2012; Sturdevant & Spear, 2002). This age group may associate personal identity and status with food consumed, and the meanings they attach to particular foods can influence their food choices (Amos, Intiful, & Boateng, 2012; Brown, Shaibu, Maruapula, Malete, & Compher, 2015; Maxfield, Patil, & Cunningham, 2016). Adolescents tend to be at a point in their life where they may be making more food choices outside of their familiar home environments (Holsten, Deatrick, Kumanyika, Pinto-Martin, & Compher, 2012; Ziegler et al., 2021). Most independent food choices made by this population group occur in contexts outside the home, such as in school, community settings, and during leisure time activities with peers (Amos et al., 2012; Contento, Williams, Michela, & Franklin, 2006; Maulida, Nanishi, Green, Shibanuma, & Jimba, 2016; Maxfield et al., 2016; Rathi, Riddell, & Worsley, 2016; Story, Neumark-Sztainer, & French, 2002; Voorend et al., 2013). Some of the major food choice considerations identified by adolescents in LMICs include perceived prestige or social status associated with consumption of a food item, cost, and taste. Health value and convenience are valued as well but can sometimes play a less significant role in the decision-making processes (Amos et al., 2012; Brown et al., 2015; Fernandes, Folson, Aurino, & Gelli, 2017; Maulida et al., 2016; Maxfield et al., 2016; Rathi et al., 2016; Sobal & Bisogni, 2009; Verstraeten et al., 2014; Voorend et al., 2013; Waddingham, Shaw, Van Dam, & Bettiol, 2018).

Sociocultural drivers of food choice are important influences that are often overlooked in understanding what, how, and why people eat the way they do (Blake et
al., 2021; Boatemaa, Badasu, & De-Graft Aikins, 2018; Ozodiegwu et al., 2019; Sobal & Bisogni, 2009). In Sub-Saharan Africa, cultural expectations and standards for ideal body size and body image perceptions are often critical sociocultural drivers of food choice (Agyapong, Annan, Apprey, & Aduku, 2020; Amos et al., 2012; Cohen, Boetsch, Palstra, & Pasquet, 2013; Duda, Jumah, Hill, Seffah, & Biritwum, 2007; Flax, Thakwalakwa, Phuka, & Jaacks, 2020; Hagan, Nsiah-Asamoah, Hormenu, Pollmann, & Schack, 2018; Puoane, Fourie, Tsolekile, Nel, & Temple, 2013). Females, especially, are encouraged to keep a larger body size as it signifies wealth, beauty, health, prestige, and fertility (Coetzee et al., 2012; Gitau, Micklesfield, Pettifor, & Norris, 2014a, 2014b; Oloruntoba-Oju, 2007; Pradeilles et al., 2021; Puoane, Tsolekile, & Steyn, 2010; Tuoyire, Kumi-Kyereme, Doku, & Amo-Adjei, 2018; Wrigley-Asante, Agyei-Mensah, & Obeng, 2017). Conversely, slender body sizes tend to be associated with poverty and sickness (Cohen et al., 2013; Dotse & Asumeng, 2014; Flax et al., 2020; Okop, Mukumbang, Mathole, Levitt, & Puoane, 2016; Siervo, Grey, Nyan, & Prentice, 2006).

Due to significant changes in physical appearance, sex and gender often have a major effect on the creation of body dissatisfaction and potentially, eating disorders, among adolescents (Izydorczyk & Sitnik-Warchulska, 2018; Kelly, Zilanawala, Booker, & Sacker, 2018; Micali et al., 2015; Reel, Voelker, & Greenleaf, 2015). In many instances, those in this phase of life may have learned about the changes they will or already have experienced and have become more aware of the effects on themselves or their peers. Adolescent females tend to be more self-conscious and possess a negative body image more often than males due to the increase of body mass and fat tissue congruent with menses and other pubertal changes. Such physical changes may
undermine cultural ideals to possess a slim or perfect figure (Balluck, Toorabally, & Hosenally, 2016; Gaylis, Levy, & Hong, 2020; Gitau et al., 2014a, 2014b; Mooney, Farley, & Strugnell, 2009; Pedro et al., 2016; Pope, Corona, & Belgrave, 2014; Pradeilles et al., 2021; Som, Mishra, & Mukhopadhyay, 2016; Yan et al., 2018). Adolescent males too might encounter body dissatisfaction if their appearance deviates from cultural standards of masculinity and attractiveness, including tall stature, broad shoulders, and musculature (Ata, Ludden, & Lally, 2007; Bibiloni, Pich, Pons, & Tur, 2013; Gitau et al., 2014a, 2014b; Turel et al., 2018).

Parents, family members, friends, peers, and the media can have a negative influence on an individual’s body image perceptions, particularly in adolescence (Ivanović, Milosavljević, & Ivanović, 2017; Izydorczyk & Sitnik-Warchulska, 2018; Lawler & Nixon, 2011). These influences can be direct and can include teasing, shaming, or criticizing of the individual’s physical appearance. They can also be indirect by someone else communicating their own body image dissatisfaction to the individual, or through stressing the significance of social and cultural standards around body size and shape (Ivanović et al., 2017; Micali et al., 2015).

As the nutrition transition continues to make its way across Sub-Saharan Africa, local and multinational food and beverage companies are increasingly able to invest in promotion of their products across various communication platforms (e.g., television, internet, radio, outdoor advertising) to reach large swaths of the populace (Amevinya, Quarpong, & Laar, 2020; Kumi & Laar, 2020; Tsrah, Quarpong, Laar, 2020). As a result, adolescents, particularly those residing in urban areas of the region, are increasingly exposed to promotion of body ideals through food and beverage marketing.
communications that are incongruent with traditional standards and expectations for appearance (Agyapong et al., 2020; Amos et al., 2012; Dotse & Asumeng, 2014; Duda et al., 2007; Ramalho, Lachal, Bucher-Maluschke, Moro, & Revah-Levy, 2016; Terhoeven et al., 2020; Tuoyire et al., 2018; Wrigley-Asante et al., 2017). Many food and beverage advertisers target this age group directly using various tactics to persuade them to try to look a certain way by consuming certain foods. Conflicting body image messages that adolescents receive related to familial and cultural expectations, Westernized food and beverage marketing, and individual attitudes and beliefs in this transitory period may contribute to the increased consumption of unhealthy foods or disordered eating habits that can ultimately lead to the rise of diet-related NCDs in adulthood as well as poor mental health outcomes (Belitz & Frank, 2010; Hoek & Gendall, 2006; Wrigley-Asante et al., 2017, Benowitz-Fredericks, Garcia, Massey, Vasagar, & Borzekowski, 2012; Caradas, Lambert, & Charlton, 2001; Corsica & Hood, 2011; Ricciardelli, McCabe, Williams, & Thompson, 2007; Terhoeven et al., 2020).

Ghana is a country in Sub-Saharan Africa that is in an intermediate stage of the nutrition transition, where food systems are altering and diets are shifting from traditional, nutrient-dense foods to more processed, energy-dense, and animal-source foods (Dake, Thompson, Ng, Agyei-Mensah, & Codjoe, 2016; Ofori-Asenso, Agyeman, Laar, & Boateng, 2016; Popkin et al., 2012; USAID, 2018). Local foods are widely consumed, but there is also a significant presence of larger multinational corporations such as Coca-Cola®, Yum! Brands (parent company of Kentucky Fried Chicken® and Pizza Hut®), and Nestlé® (Searcey & Richtel, 2017). The food industry and food retailers in Ghana’s capital, Accra, have invested significant resources into proliferation
of products containing high levels of refined carbohydrates, sodium, and saturated fats into various food environments (Aryeeey et al., 2017; Dake et al., 2016; Laar et al., 2021).

This study aimed to examine how attractiveness and body image are conceptualized among school-going adolescents in urban Accra, Ghana, and how various cultural messages from friends and peers, family, and the media regarding body image influence their food choice behaviors. The four questions we sought to answer were: 1) What are the general attitudes and perspectives about body image among junior high school adolescents in the Greater Accra Region of Ghana? 2) What is the influence of friends and peers, family, and schools on how adolescents perceive their bodies? 3) In what ways do adolescents consider their physical appearance when making decisions about consumption of various portion sizes of healthy and unhealthy foods? and 4) How do body image perspectives differ by gender and by age?

Obtaining these insights will be important in guiding the development of future food environment interventions and policies targeted toward adolescents to prevent and control diet-related NCDs in LMICs like Ghana. The knowledge gained can help global health practitioners to tailor age- and culturally- appropriate programs and strategies to improve global population health.

4.3 Methods

The study described below was part of a larger study conducted in the Greater Accra Region of Ghana, the most urbanized region of the country and location of the nation’s capital. The parent study, entitled “Measurement, Evaluation, Accountability
and Leadership Support for NCDs Prevention” (referred to as “MEALS4NCDs”), among others, sought to understand the nature and extent of unhealthy food and beverage marketing to better support public sector actions for building healthier food environments for Ghanaian children. Details of the parent study’s protocol as well as adherence to ethics committee regulations may be found in previously reported study documentation (Laar et al., 2021). Briefly, MEALS4NCDs drew from the International Network for Food and Obesity/NCDs Research Monitoring and Action Support’s food provision and food promotion modules to provide evidence for implementation of future interventions through monitoring and benchmarking food environments (INFORMAS, 2021; Laar et al., 2021). The MEALS4NCDs Project was a cross-sectional study that made use of multiple data gathering approaches including mapping of advertisement and food outlets within 250 meters of school zones, monitoring of television advertisements, interviewing school headmasters, conducting supermarket inventories, and other activities in the Greater Accra Region of Ghana (Laar et al., 2021).

This study used qualitative methods. A semi-structured interview guide was created to enable probing based on the respondent’s answers to the main interview questions. The utility of this research design was in obtaining a deeper understanding of perspectives that the population group of interest has regarding health, nutrition, and factors influencing food choice behaviors that may not be as easily obtained via quantitative measurement tools (Gill, Stewart, Treasure, & Chadwick, 2008). The interview guide contained three different sections which covered the following topics: (1) food literacy, food choice behaviors, and portion sizes, (2) body image perceptions and
food choices, and (3) reactions to food and beverage advertisements and perspectives on food environments (Appendix A).

The interviewers for each district were MEALS4NCDs data collectors or site supervisors who had some prior experience in qualitative data collection methods. The lead researcher (KR) trained each interviewer on the specific aims of the study, application of the interview guide, and appropriate probing styles for this study. During the interview, questions on healthy and unhealthy food consumption were asked, including the types of food eaten, consumption of different portion sizes, and food acquisition practices. Then, a figure rating scale, similar to one first conceptualized by Stunkard and colleagues (1983) and previously validated for use in African context (Figure 4.1), was incorporated to facilitate discussion about body sizes and shapes and to elicit responses regarding conceptualizations of attractiveness and unattractiveness (Ettarh, Van de Vijver, Oti, & Kyobutungi, 2013; Okop et al., 2016; Stunkard, Sorenson, & Schulsinger, 1983). Weight and height measurements of students were not taken. Later, students were asked about who or what influenced their body image perceptions, the role of food in body image satisfaction or dissatisfaction, and reasons for wanting to attain or maintain a specific body size or shape. Finally, the interview concluded with a conversation with the student about the influence of food advertising tactics and their local food environment on their food choices.
The MEALS4NCDs Project recruited a total of 200 public basic (e.g., primary and junior high grade levels) schools across six districts of differing urbanization and poverty levels in the Greater Accra Region of Ghana (Figure 4.2) (Laar et al., 2021; Ohene-Adjei et al., 2017).

For the present study, purposive sampling was used to select students for interview participation. The parameters used to recruit students were in accordance with maximum variation sampling and included sex, age, observed body weight, and school size (defined as number of students per school). The number of students interviewed per district was informed by the Ghana Education Service 2018 approximate public school enrollment figures (roll size) for junior high schools by district (Ghana Education Service Information Management System, 2018; Laar et al., 2021). Districts with smaller roll
sizes had less students interviewed than districts with larger roll sizes. One male and one female student were interviewed in each of the 24 schools, for a total of 48 interviews. The students were between the ages of 14 and 17 years old.

Figure 4.2: Data collection sites in the Greater Accra Region of Ghana (Ohene-Adjei et al., 2017)

After receiving ethical approval, the research team recruited students through direct recommendation by school headmasters (or their designees) who were interviewed separately about school food provisioning by the MEALS4NCDs staff per the main study protocol (Laar et al., 2021). The interview objectives and nature of questions were explained to the school headmaster or their designee, as well as the eligibility criteria and the need for a diverse sample using the aforementioned factors for maximum variation sampling. Study information sheets containing staff contact information and consent forms were provided to school officials. Upon providing adult consent for minor study participation, the school official identified two students (one male, one female) from their
school whom they believed would be appropriate students for this research activity. The study team requested the school headmaster select students who could confidently express their thoughts and ideas in English, were outgoing around unknown people, were free at the time of interview during the school day, and met the other maximum variation sampling parameters of differing observed body weights and ages (student was to be under 18 years old). The interviewer read the consent form aloud and the student was allotted opportunities to ask questions or obtain clarification on any concerns. Students were informed that they would not be subject to any penalties should they choose to end their interview participation early, and that they did not have to answer any questions that gave them discomfort. Prior to the interview commencing, the interviewer read the assent form to the student and requested their signature.

The original plan was to obtain parent or caregiver consent for students to participate in the interviews. Due to the ongoing COVID-19 pandemic, there were numerous logistical challenges such that the study team determined it would be best to minimize exposure and infection risk for all parties involved. Thus, an amendment was submitted to the University of Ghana and the University of South Carolina research ethics boards to approve for the school headmasters or their designees to provide adult consent in lieu of the student’s caregivers.

Digital voice recorders were used to capture responses from students. A lapel microphone was provided by the lead researcher (KR) to the student to wear during the interview. Interviews were conducted the same day that consent was obtained from school officials in a quiet area of the school property and adhered to strict COVID-19 safety protocols required by the Ghanaian government, including wearing of face masks.
and social distancing. To provide a comfortable space for the student to freely talk to the researchers, all interviews were conducted on the school property without the school staff or other students present. While the lead researcher (KR) was a foreigner, the interviewer who engaged with the students was always a local Ghanaian member of the MEALS4NCDs study team, who could take the cultural and social context into consideration when phrasing the questions appropriately to the students. Additionally, the interviewer spent approximately ten minutes prior to the interview conversing with the student about topics of interest such as sports or music to build rapport. Throughout the entire interview, the interviewer would use member checking to paraphrase or summarize the student’s statements and would ask them to confirm the accuracy of understanding. Interviews were conducted in English and lasted between 45-90 minutes. To assist with data triangulation later on, the lead researcher (KR) made field notes on student and interviewer behaviors and contextual considerations during the dialogues. Each student who completed the interview received a MEALS4NCDs-branded study t-shirt or notebook as an incentive. Audio files were downloaded onto a secure external hard drive as well as stored on Dropbox, with access granted only to specific parent study team members on a case-by-case basis. The recordings were subsequently deleted from the recorders after they were saved in the aforementioned secure locations.

Data Analyses

Interviews were transcribed verbatim, de-identified, and checked for accuracy by the lead researcher (KR). Transcripts were uploaded into NVivo 12 qualitative software
to aid in data management and analysis (QSR International Pty Ltd, 2018). Analysis was inductive and thematic in multiple stages. First, open coding was used by creating categories from the first five transcribed interviews of high quality (as determined by the lead researcher (KR)’s field memos on each interview) (Corbin & Strauss, 2007; Creswell, 2012; Maxwell, 2013; Raskind et al., 2019; Strauss & Corbin, 1990). After the first five transcripts were coded, the codes were reviewed by the other investigators for suitability and rigor. Keeping the specific aims of the study in mind, the researchers came to an agreement about appropriate initial categories. A codebook was created using the initial categories, and extra codes or categories were constantly added or revised from the remainder of the transcripts in an iterative process. The next phase involved axial coding, where concepts and categories were grouped into thematic maps to uncover relationships between ideas presented in the data. Lastly, selective coding was employed to pull all the themes and ideas together into a coherent story (Corbin & Strauss, 2007; Creswell, 2012; Raskind et al., 2019; Strauss & Corbin, 1990).

Throughout the coding process, the sociocultural and environmental context from which the students’ thoughts and perspectives emerged were considered. Credibility of interpretation was strengthened by engaging the interviewers in helping to review and revise the lead researcher (KR)’s field memos as needed, member checking with the student during the interviews, and peer debriefing by presenting results to MEALS4NCDs colleagues and other food choice researchers (Bisogni, Connors, Devine, & Sobal, 2002; Lincoln & Guba, 1985).
Ethics Statement

The study described in this article was approved by the University of Ghana’s Ethics Committee for the Humanities (protocol #128/19-20) and the University of South Carolina’s Institutional Review Board (protocol #PRO0097113).

4.4 Results

The mean age of students was 15.60 ± 0.869 years old (Table 4.1), with half of the sample female.

Table 4.1: Demographic characteristics of students

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n (=48)</th>
<th>% (=100%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>24</td>
<td>50.0</td>
</tr>
<tr>
<td>Female</td>
<td>24</td>
<td>50.0</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>4</td>
<td>8.33</td>
</tr>
<tr>
<td>15</td>
<td>19</td>
<td>39.6</td>
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<tr>
<td>16</td>
<td>17</td>
<td>35.4</td>
</tr>
<tr>
<td>17</td>
<td>8</td>
<td>16.7</td>
</tr>
<tr>
<td><strong>District</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accra Metropolitan Assembly</td>
<td>12</td>
<td>25.0</td>
</tr>
<tr>
<td>La Nkwantanang Madina Municipality District</td>
<td>12</td>
<td>25.0</td>
</tr>
<tr>
<td>Ashaiman Municipality District</td>
<td>6</td>
<td>12.5</td>
</tr>
<tr>
<td>Kpone Katamanso Municipality District</td>
<td>6</td>
<td>12.5</td>
</tr>
<tr>
<td>Ga South Municipality District</td>
<td>6</td>
<td>12.5</td>
</tr>
<tr>
<td>Ningo Prampram District</td>
<td>6</td>
<td>12.5</td>
</tr>
</tbody>
</table>
The following five themes (Table 4.2) emerged from the data: 1) conceptualizations of attractiveness and unattractiveness, 2) importance of achieving and/or maintaining a specific body image, 3) desired body size or shape, 4) sociocultural influences on body image, and 5) body image influence on food choices.

Table 4.2: Themes and subthemes

<table>
<thead>
<tr>
<th>Themes</th>
<th>Subthemes</th>
</tr>
</thead>
</table>
| Conceptualizations of attractiveness and unattractiveness | • Physical attributes of attractiveness or unattractiveness  
• Non-physical attributes of attractiveness or unattractiveness |
| Importance of achieving and/or maintaining a specific body image | • Attracting romantic partners  
• Avoiding physical limitations  
• Preventing social stigma about body size extremes  
• Enhancing social status among peers |
| Desired body size or shape                | • Body image satisfaction  
• Body image dissatisfaction |
| Sociocultural influences on body image    | • Parents and family  
• Friends and peers  
• Media and celebrities |
| Body image influence on food choices      | • Changing food choices to change body size  
• Changing food choices to look like admired person |

**Theme 1: Conceptualizations of attractiveness and unattractiveness**

This theme refers to the ways that respondents characterized attractive and unattractive features in a person. The main theme was grouped into four subthemes: 1)
physical aspects of attractiveness, 2) non-physical aspects of attractiveness, 3) physical aspects of unattractiveness, and 4) non-physical aspects of unattractiveness.

For male students, muscularity, including “six-pack abs,” “broad chest” and “broad shoulders,” were commonly cited as pinnacles of attractiveness in Ghanaian society. A lack of muscularity or general lankiness was believed to show weakness. For instance:

“In Ghana……ok, Ghanaian aspect of handsomeness or attraction is this; when you are…ok……muscular, maybe you’re not deformed in anyway, maybe….ok…your face appears nice or something, then you’re like handsome or something. But when you get a bit of stomach like mine, the ladies in Ghana, they prefer something they call ‘six packs’. So if you have it….ooohh you’re a handsome guy to them, uh huh.”
(male, age 16)

“Oh, they have average arms; not too thick……not too fat. And almost slim, like not….out of ummm, …a 100% is fat, so 50% is the middle. But the arm thickness should be about 40%. And the person has thick calf and…also, he must have a broad chest with sizeable shoulders. They should not be too…too like narrow…They should be wide, and the neck shouldn’t be long. It should be short, and ummm…the person is tall. Like the person is like five foot ten…that’s it.”
(male, age 14)

For female students, a curvy or “Coca-Cola” body shape containing wide hips, full buttocks, and medium-sized breasts, as well as straight or soft hair were mentioned as the most aspired body features. Typical comments included:

“Like…a Coca-Cola bottle. How it is……the--from the shoulder to the--stomach should be a little slim. But from the waist to the hips and the legs should be a little big.”
(female, age 16)

“She's curvy and she has a lot of flesh. She's not slim umm--- she's not umm---fat and she's –she’s also fit.”
(female, age 15)
Both sexes placed a high value on a “flat stomach,” “proportionality in body parts,” “fair skin color,” “face,” “dressing well,” “looking fresh,” and a “tall stature.” For instance:

“In complexion, ok, complexion I think any of them matters. Maybe whether you are dark or fair or something. But most ladies would go in for a fair person…uh huh…because there is this kind of notion about; when you’re a fair person, then they like you. for instance, this town, for instance, I can say that most of the youth are yearning to become fair. So when you take three people, when we pick any three people, you’ll see that among them only one person is a dark person. All the rest, they’re fair. They’re fair, not by default….[student giggles]…by bleaching.”
(male, age 16)

“Uhhh tall—with nice facial and with… [Student chuckles]… I mean when you like dress very well.. eat very well also. So the body is hot so…yeah.”
(male, age 16)

Non-physical aspects of attractiveness were discussed by some male students. For example, wealth and grit were cited as features that would make someone attractive:

“And in Ghana, if you don’t have money or something, no matter how handsome you are, you’re not handsome…..(giggles)…..whilst the money is there, you’re handsome.”
(male, age 16)

“Sometimes I look at their background…how they were when they were young. Some didn’t even get the chance to attend school. But still they are there and now they are having cars, they are having- they dress neatly, you see that they are still having money.”
(male, age 17)
Students also voiced their perspectives on unattractive physical attributes. Both males and females stated that a “darker skin color,” “shorter stature,” “big head,” “protruding belly,” “overweight,” and “obese” were undesirable. Female students were more vocal than male students in their opinions on unattractive features, characterizing “very large breasts,” “very small breasts,” “flat buttocks,” and “rough-textured hair” all as unattractive features. Some comments included:

- “Yeah, sometimes they say, umm, being fat and then a boy who has buttocks or what is not nice…and then uhh--a man with big stomach too, it doesn’t look attractive at all”  
  (male, age 17)

- “Then the stomach…we don't like someone who is like a pregnant woman, no. We like somebody who has umm,,..I mean, flat tummy.”  
  (female, age 16)

Theme 2: Importance of achieving and/or maintaining a specific body image

Students felt that it was important to have a specific body size or shape to be able to attract prospective romantic partners. Female students noted more often than males that they felt pressure to acquire or maintain the cultural standard of “not too slim, not too fat” body ideals. For example:

- “Ok a good and attractive Ghanaian woman should have big buttocks, yeah, and have the--have a flat tummy, so wider hips and flat tummy, yeah. It makes people get attracted.”  
  (female, age 15)

- “Then, most girls or women like slim and tall guys, so I will say…that’s why I say this is attractive”  
  (male, age 15)
One male student noted that it can be hard to attract romantic partners if you are overweight or obese:

“Maybe…in my opinion, I will say [overweight or obesity] is bad because, umm let me come to--- in terms of getting married or something. When you are fat, it’s not like, it’s not very easy for you to get a partner. Because…when a lady sees you, she says this guy is too fat. They don’t like fat guys. That’s the thing, yeah.”
(male, age 16)

Another reason that students thought it was important to maintain a specific figure was to avoid physical limitations. Both male and female students in this study expressed significant concerns about potential reductions in mobility that people with excess body weight might face, which can subsequently affect both income-generating and leisure activities. Typical comments included:

“Student: Like they said if you are too much fat, like when you grow your knees and stuff, it will be paining you. And it--- it’s like a related disease. But I don't even know. That's what I've been hearing.
Interviewer: What are some of the diseases?
Student: umm--- maybe the obesity, say like if you are that much fat uhhh--- you won't be able to do your daily activities. Such as maybe, let's take it, for instance, you are a trader. If you are too fat, uhhh--- you won't be able to sell.”
(female, age 15)

“Me in particular, I like dancing a lot. But--and my sister too like dancing. But I realized that because of the time that we do eat in the house, especially the dinner, our supper, it has made them become fat. So, when she is dancing, it’s not attractive like how it used to be. You see when you’re slim too, you’re able to move your body easily compared to when you’re ..........even when you’re fat too, you’re able to move your body. But when you’re too fat, you move the body and the body is controlling you. Sometimes even walk is a problem.”
(male, age 16)

“We say the person is too fat. That person is too fat and if we should say something an emergency, he should run right now, the person can't run. He'll fall and all of us will run over him.”
(male, age 17)
Several students expressed the need to maintain a specific body size and shape to prevent ridicule or stigmatization from others. Larger body sizes were deemed acceptable for older people, but for adolescents, it was reported that an overweight/obese figure was unacceptable. Some comments included:

“Because…maybe, perhaps to avoid this kind of societal stigmatization because of the size of your stomach as a young boy, because you’re fat. Yes, there’s some kind of stigma. When you’re very old, it’s ok. And when you’re fat by inheritance too, its considered ok. But let’s assume you’re a normal person and you’re having this kind of….you’re not old, like, you’re among the youth and having this kind of big stomach, not by inheritance. Because when you’re having a big stomach, you’d have to have a big body to match the stomach. But this time, you’re having the slim body but your stomach is big. It carries a stigma wherever you go; ‘aye, why is it you’re…’? Sometimes they give it a name; like ‘Case 5, Case 4’…and they have a name, ‘pot belly’”
(male, age 16)

“Ok, they will say they shouldn’t be very fat because in Ghana, most of the time they say when you are too fat, you look like an elderly person, an ugly person”
(female, age 14)

Having a noticeably smaller body size was also a potential source of stigma, as one female student reported:

“…I feel like, umm, maybe you may passing and then someone will be pointing at you, ‘this person is too slim’ or ‘doesn’t have breast,’ ‘the tummy is big than the shape.’ Yeah, like ‘the calves are too small.’”
(female, age 16)

A final explanation provided regarding maintenance of an attractive body figure was to enhance one’s social status among their peers. Aspects such as most female
students discussed hairstyle and fit of clothing important to maintain an attractive public persona. For example, two females shared:

“When I said when you are fat there are some dresses when-- that you wear you don’t look good in it”
(female, age 16)

**Interviewer:** “What do they see before they say this girl is having a nice shape?”
**Student:** “Umm, your hips maybe the dress you're wearing, how it fits you and how your shape looks in the dress…Ok well, like how my uniform is. Maybe you can wear maybe here its sit up and it’s flair. So even if it’s flair, your shape would even show in the dress.”
(female, age 16)

**Theme 3: Desired body size or shape**

Most of the adolescent students we interviewed expressed some body size dissatisfaction and desire to change some aspect of their physical appearance. As part of the interview, students were asked to review and determine which of the body silhouettes they believed were appearing the “healthiest” and then “most attractive.” Following that, students were asked to identify which silhouette mirrored their appearance and then which silhouette, if any, did they aspire to look like (Table 4.3).

Both male and female students believed that a heavier body size would be indicative of a healthier body figure, while a slimmer body size was more attractive. Both groups of students believed that a body figure around size 7 appeared the healthiest. On average, male students put themselves at approximately figure 6 but wished to appear a size 4, which they also stated was the most attractive figure. Female students on average put themselves at a body size of almost 7 and aspired to reduce their weight to about 5, which they also stated was the most attractive figure.
Female students generally expressed more body-size dissatisfaction than male students. For example, females mainly discussed a desire to have “wider hips,” “look like a model,” “lose weight,” or “gain weight.” Males mainly felt like they needed to be “taller” and “gain muscles.” A few students expressed worries about their height (e.g., “I do not think I am tall enough”) or hair consistency (e.g., “My hair is not soft enough”):

“To me, I compare myself to people who are tall, at my age. Because there are people who are 15 years but are taller than me. So I feel I’m short and then maybe I’m lacking something. But my parents used to say that’s my stature. That’s what God has given me and sometimes too, they say when you exercise you might gain more height than before. But I don’t think it’s true.”
(female, age 15)

“And the hairstyle, how the hair looks like. Some...some of them have soft hair and I am having the hard type of hair. So I will say sometimes when I look, when I’m watching tele [television] and I see people on the tele, I just compare myself to them. I just want to be like them because they look better than I do.”
(male, age 16)
A minority of students expressed satisfaction with their current body size and shape. Female students described themselves as “pretty,” “slim,” and “normal,” while male students often described themselves as “fit,” “normal” or “slim.” Students who described themselves in positive terms also preferred to maintain their current body shape and size, rather than actively pursuing any changes. With few exceptions, in this study, the older adolescents (16-17 years old) tended to be more comfortable with their appearance than the younger adolescents (14-15 years old). Some exemplary quotes included:

“…I feel ok, like if I’m going to play ball, I just don’t feel heavy than the ball and I can’t run or something I just want to be how I am, yeah.”
(male, age 16)

Interviewer: “Do you or other kids ever try to change the way you eat in order to look like someone you admire? Someone whose body you admire?”
Student: “Yes…. I used to do that. I used to do that but now I don’t. because I, I love myself the way I am. But then initially, I was a little fleshier than I am now.”
(female, age 15)

Theme 4: Sociocultural influences on body image

Students stated many factors that influence their perceptions of themselves and their appearance. By and large, students tended to side more with their friends/peers and the media on ideal body size and disagreed more with their family’s perceptions.

Friends and peers were cited as one of the strongest influences on body image among the students interviewed in this study. Both males and females discussed the ways their friends talked about body sizes and shapes, and what features were considered attractive in their peer groups. For example, two students said:
“Okay, I... mm-most of my friends, we like to look like a model...Don't want to be, fat, nor lean.”
(female, age 16)

“Ok. Maybe--- when we are at school, sometimes when we at school and you are like... like you are fat, your friends seem to laugh at you. And if you are slim too, they talk. They have been saying ‘oh this guy is too slim.’ Errr--. But when you are...like you have a little...flesh and you are ok--- and the structure, people, ooh this guy is nice. Especially, when it comes to... in terms of the girls, like they like guys like that and so...”
(male, age 16)

Females particularly talked about how their friends would sometimes comment on their appearance:

Student: “Like, [laughs]...okay, like from like... how should I say it--- the comments others pass they are like I should become some--- I become somehow fat, not all that slim. They’re like ‘I'm too slim, I'm too tiny.’ ”
Interviewer: “Who are these others, are these kids at school, or your parents or?”
Student: “Errr--- like others, like my friends.”
(female, age 15)

“Umm the...my friends told me that I’m short. Yes--- and sometimes I will be like I wish I was tall. When I see a tall girl like that. Yeah... I will be like I want to be tall, and I want to lose weight. Yes.”
(female, age 15)

Some discussed other peers and people in their communities of the same age cohort who also desired to change their physical appearance, which they also felt they should do.

For example:

“They are trying to get the six packs as I said, so they go through a lot of umm—stomach training and they take in a lot of foods that will make them have flat stomach. Yes. And even I also want to be like them.”
(male, age 16)
Most students reported an ongoing tension between what they considered to be an ideal body size and shape for their age compared to expectations put forth by their parents or other family members or elders. Both male and female students said that their families often complained that their current body size was too small for their age and wanted their child to gain weight. Students shared that this idea was related to a widespread cultural perception among older adults that if you have a larger body size, it could signify wealth or a higher social status, and that the caregiver is able to afford to feed the child good food to support their growth and development, which can ultimately lead to their success later in life. Some illustrative comments included:

“They [parents, elders] want you to be fat. Because the moment you start to show/exhibit signs of fatness, it means they’re feeding you well. To them they are feeding you well. But when you come and you’re always like ‘one’, they ask you; ‘ahh’…I have a little/small sibling, ahh this girl will eat, she is always eating but when you see her, smallish. And people always ask questions; ‘why is it that she is small like that? why is she small like that’. she eats a lot. Sometimes, banku, she can manage to eat one ball at her age, but she’s always slim. People just cannot understand the fact that it is inheritance or that’s how their family structure is. So they are always judging her, uh huh. In my house for instance, when you’re fat…my sister for instance, ever since this lockdown and she’s been staying at home, I’ve realized that she has increased in weight. But me, I can’t see myself to know that I still look smallish. Just that it is the stomach and the head that have appeared. So because of that, when they see me they say that I’m not growing. That’s what they say. In the house, when you’re slim and you’re not increasing in size, they don’t see you growing, they see you to be always static in your growth.”
(male, age 16)

“And I said it shows that the parents, they will think umm a girl of this, this size, umm… eat food, well cooked food, yeah. That means the parent don’t just give her some sugary snack always. She takes in balanced diet and so on.”
(female, age 14)
“Because my mother will be like...you should be healthy...you should eat a lot and be healthier. And my mother, she likes food and even if I be like, ‘mummy it’s okay.’ She will be like, ‘this small thing.’ And I will be like, ‘yeah—its okay.’ And she will give us plenty food.”
(female, age 15)

The final influence on body image as described by students was popular media, including athletes, models, actors/actresses, musicians, and social media influencers. Males largely aspired to have body structures like famous football (i.e., soccer) players, while female students mostly aspired to be like actresses or influencers. Students reported comparing their bodies to various famous people, and occasionally modeling their appearances after those they idolized. Some statements included:

“Interviewer: So now tell me about a person that you admire. Somebody who you think is nice, attractive and--- whoever you can know them personally or they can be an actor or a sports person. And...so... tell me about somebody like that.
Student: Because of the body. Uhhh--- Ronaldo. Cristiano Ronaldo [professional soccer player]. The way his, his tummy is flat and his uhhh, muscular body, the way he speaks. I like him.”
(male, age 17)

“She [model/actress Zendaya] works out. She likes working out...a lot. And judging from her occupation, she’ll not be at one place for a long time. So she is always moving about. And she’s a model so she has a figure, they have a certain figure that you have to keep. So she can’t be fleshy, because models are supposed to be firm and...yeah. I want to be like that too.”
(female, age 15)

“Yeah, we are not used to-- I mean, taking in vegetables and all those exercising and that. But after seeing-- I mean, we watch a lot of TV programs and sometimes we watch people exercising. Yeah, even this one on TV3, when we started watching it, we thought that, oh yeah fat people were becoming slim. So we thought that, we are slim though, but let’s try and make our life more healthier. So yeah, we started eating vegetables, fruits, exercising, balancing certain foods.”
(female, age 16)
Theme 5: Body image influences on food choices

Most students who participated in this study admitted to either changing their own food choices or to knowing someone who changed their food choices to change their body size or to emulate the habits of someone they admire. Students who wanted to lose weight talked about reduction of certain food items, particularly carbohydrate-rich foods like rice or banku [*traditional Ghanaian dish made from fermented maize and cassava dough*]. Examples of perspectives included:

“**Student**: Sometimes, I take porridge with bread and fried egg.  
**Interviewer:** So do you take more of it or less of it in order to change your body size?  
**Student:** Sometimes half of it. Let’s say not that---I think that’s good. Like that’s how I want to be. Like I don’t want to be fat… I want to be like my pastor. How he is. So that I will look attractive.”

(*male, age 16*)

“Uhh, when I’m given rice…I eat and leave the rest for my sister. So when she ask “why did you leave?”, I tell her I don't want to grow fat.”

(*female, age 16*)

“**Interviewer:** Do you change the way you dress, or walk, or act? Do you change your diet? Exercise habits?  
**Student:** Yeah, sometimes I change my diet. Like when I see such people I think they eat or take in more of the protein food. That's why they are able to possess that body. So I also try to add more of the protein food to my diet. Maybe previously I was not taking much protein. Due to that, it has resulted in many deficiencies. So when I see such people, I try to also take in or eat some some diet that I think it will help me to reach their level or how they look like.”

(*male, age 17*)

Students who wanted to gain weight or muscles or appear stronger shared that they would increase their protein or carbohydrate consumption:
“Sometimes I feel I'm too thin, so I should eat more.”
(female, age 16)

“…Sometimes when I think…sometimes when I look at my body and I think; ‘oh I’m too slim’, the banku that I eat, I sometimes eat more. And also, I think because I’m too… I must eat some vegetables and fruits to better my metabolism…it makes you more healthy and more….look more fit.”
(male, age 14)

Other students discussed how they and their friends would experiment with different diets to augment their body sizes. One female student said:

“We one day actually planned to examine ourselves. We wanted to see if we take in a lot of carbohydrate, if we will become fat. So we started eating a lot of bread, rice, yam, plantain and all those things and we started gaining weight. But we stopped. But one of my friends up to now, she’s still taking it and now she’s fat. She was slim like me, but after taking it, she wasn’t.”
(female, age 16)

Some students discussed their thoughts on the role that diet plays in the lives of people whose figures they admire, such as celebrities and athletes. For example, a “balanced diet,” along with “being selective about food,” were commonly cited as reasons that certain people were able to maintain the ideal body size and shape.

“And she [model/actress Zendaya] doesn’t…she takes care…she like…she’s selective when it comes to food. Because some kind of food will make you fat. Maybe she’s not taking too much of animal protein…like meat. Like she’s taking, like plant protein, like groundnuts and those things.”
(female, 14 yrs old)

“I think he [athlete Cristiano Ronaldo] eats a healthier food or a balanced food that keeps the growth of the body, to be in the right proportion. So he eats food that supports his growth.”
(male, 17 yrs old)
4.5 Discussion

The students we interviewed provided a wealth of perspectives regarding attractiveness and unattractiveness, body size satisfaction and dissatisfaction, various positive and negative influences received from external sources on body image, and the role of those ideas in food choice decision-making. Students of both sexes expressed that their ideas about attractiveness, unattractiveness, and desired body size often conflicted with those of their parents and elder family members, who preferred that they possessed a body size and shape in accordance with traditional Ghanaian and African cultural norms. Nearly all of the students conceded that they had derived their ideas about beauty from various mass media platforms and also their peers. They said that they believed that famous athletes, musicians, television and film stars, and other celebrities were “fit,” “beautiful,” “talented,” and “wealthy,” and that those characteristics were viewed as critical desirability by others and success in life. The students discussed how they would alter their food choices, including the types of foods and portion sizes consumed to change their body sizes. For example, male students talked about times where they would consume a higher proportion of protein-rich foods compared to carbohydrates or other macronutrients at various points to gain more upper body muscle mass, which was seen as an attractive characteristic among their peer group. They mentioned their need to enhance their bodies particularly after viewing or participating in football (i.e., soccer) games and observing the fitness of players and their wishes to emulate that. Females acknowledged that their food choices would change based on different sociocultural pressures, such as interacting with elder relatives in their households or communities who would pressure them to eat larger portion sizes to attain a larger body size.
Both sexes had body image concerns and wished to change various aspects of their appearance that they felt were imperfect, consistent with a review reporting widespread valorization of underweight bodies by young people (Pradeilles et al., 2021). Nearly all students from this study stated that they would prefer being slim rather than possess an overweight or obese body, even if the slim body was not fit or muscular. The students expressed this preference independent of the medical benefits of maintaining a slimmer body figure; rather, they stated that they believed larger body sizes were a target for social stigma or ridicule, were unattractive to prospective romantic partners, and were limiting to mobility and could hinder livelihoods.

Consistent with prior studies, an important propeller of the obesity epidemic in Sub-Saharan Africa is the cultural preference for larger body sizes, particularly for women and girls. Larger body sizes are often considered symbols of health (including fertility), wealth, and prestige (Appiah, Otoo, & Steiner-Asiedu, 2016; Agyapong et al., 2020; Flax et al., 2020; Frederick, Forbes, & Berezovskaya, 2008; Gitau et al., 2014b, 2014a; Jumah & Duda, 2008; Pradeilles et al., 2021; Tuoyire et al., 2018). These cultural and historical preferences among adults have made interventions to reduce obesity and NCDs through diet and physical activity challenging, as other studies in sub-Saharan Africa and Asia have found that body size aspirations easily trump medical reasons to adopt a healthier diet to maintain a healthy body size, with many overweight or obese people underestimating their weight and health status (Appiah et al., 2016; Bosire et al., 2020; Flax et al., 2020; Okop et al., 2016; Rguibi & Belahsen, 2006; Yan et al., 2018). The viewpoints and body size preferences of older generations were not necessarily shared by the students, however, who contended their ideal body types were leaner, fitter,
and closer to the body types touted in Western cultures. Students discussed having contrasting views and subsequent tensions with adults regarding how children their age should eat and what they should look like, with adults wishing they would eat more to gain weight. These conflicts with elders and increased pressure from their peers and widespread media consumption may be key contributors to body size dissatisfaction among students (Terhoeven et al., 2020). Even though they possessed basic nutritional knowledge, it was clear that some students had exhibited potential signs of eating disorders, including a preoccupation with body image and a fear of being overweight or obese as well as disruptions in eating patterns including meal skipping and reduction of portion size intake (National Eating Disorders Association, 2021).

Students were asked about where they commonly saw food and beverage advertisements. Most responses included internet (and in particular, social media), television, billboards and other outdoor advertising in their communities. While the parent study had monitored television and outdoor advertising, data on internet and social media advertising of food and beverages was not collected. In fact, several students interviewed for this study mentioned that they had internet access via smart phones and that they often found enticing offers for food and drink on Facebook, Instagram, and other social media platforms. At this point, there is a small body of evidence collected from high-income countries suggesting that the effects of television and outdoor advertising on adolescent food choice is less influential than the internet and social media, and that social media exposure to body image content is associated with higher levels of body dissatisfaction, disordered eating, and poor mental health (Burnette, Kwitowski, & Mazzeo, 2017; Lucibello et al., 2021; Rounsefell et al., 2020; Santarossa
& Woodruff, 2017). Social media influencers often promote fad diets that help them achieve a desired figure, which could potentially persuade adolescents to adopt those diets against professional medical recommendations, compare themselves to other users, become more self-conscious about their bodies, and seek validation from others online (Rounsefell et al., 2020). Future studies may consider investigating the techniques used by local and multinational food and beverage companies to promote their products online as well as the extent to which children and adolescents engage in the marketing on these platforms in intermediate stage nutrition transition LMICs such as Ghana.

Among adolescents, both positive and negative body image perceptions can influence health-related behaviors including food choices (Jalali-Farahani, Amiri, Zarani, & Azizi, 2021). While most students of both sexes expressed a desire to change their figures in some capacity, there were a minority that stated that they were satisfied with their physical appearance and had confidence in their social and academic abilities. For the students who expressed body dissatisfaction, they spoke of making attempts to alter their food choices to accomplish their goals, either through increasing consumption of or restricting of certain items that they believed to be healthy or unhealthy, respectively. Interesting to note, the heavily processed and ultra-processed foods that this population is often exposed to in their local food environments are generally not conducive to maintaining the idealized body sizes and shapes. In general, urban Ghanaian adolescents’ dietary patterns are tending toward higher intakes of refined carbohydrates, saturated and trans fats, and processed and ultra-processed foods. There are a higher proportion of students who regularly snack and consume more meals outside of the home, and exchange less physically active lifestyles for more screen time (Adom, De Villiers,
Puoane, & Kengne, 2019; Amos et al., 2012; Fernandes, Folson, Aurino, & Gelli, 2017; Ofori-Asenso et al., 2016; Ogum Alangea, Aryeetey, Gray, Laar, & Adanu, 2018; Watson, Wiers, Hommel, Ridderinkhof, & de Wit, 2016). This could have serious implications for the NCD burden in the country (Bucher et al., 2016; Laar et al., 2021).

Interestingly, the older students (16-17 year olds) that were interviewed for this study expressed lesser concerns about their body image than the younger adolescents (14-15 year olds). Many of the older students said that they were worried about the food they ate and the way they looked before, but as they aged, they become less critical of their physical appearance but more concerned about the health aspects of their diets. This finding contrasts with prior studies in higher-income countries that have found that older adolescents, particularly females, have higher levels of body size dissatisfaction than younger adolescents (Craike et al., 2016; Kenny, O’Malley-Keighran, Molcho, & Kelly, 2017; Mousa, Mashal, Al-Domi, & Jibril, 2010). Future studies might consider exploring the reasons why older adolescents in this context were less likely to have body image dissatisfaction than younger adolescents given that in other contexts, it is the opposite, and what effect it would have on their food choices.

This study contributes to the growing body of literature on adolescent food choice decision-making in LMIC contexts. A key strength of this study was that we gathered perspectives from adolescent male students as well as adolescent female students in urban Accra, Ghana. This is in sharp contrast to much of the body image and food choice literature which focuses heavily on female perspectives on body image and sociocultural factors associated with their eating behaviors. This study was conducted in Ghana, an LMIC in West Africa. There is a paucity of information about both adolescent body
image influences and drivers of adolescent food choice in LMICs, and particularly in sub-Saharan Africa. Considering that most LMICs like Ghana are undergoing rapid nutrition transitions and food system changes, the types of messages that adolescents receive and how those messages factor into their body image and subsequent food choices is extremely relevant in designing interventions to tackle diet-related NCDs. Another strength of this study was that we did not take height and weight readings of students, which likely helped students to feel more comfortable talking about the topic of body image without feeling judged by the study team knowing their exact measurements.

Although the results of this study contribute to the literature on body image and food choice, there are some limitations to note. The study sample was limited to public junior high school students in six urban districts of the Greater Accra Region. We did not speak to private school students of the same age group, adolescents of the same age that were not attending schools, or adolescents of the same age in other settings (for example, rural Ghana or other districts in the Greater Accra Region). Those children likely have some level of exposure to evolving food environments but may have had differing views about body image and make different food choices based on different values or considerations. As a result, some of the information gleaned from these interviews may not be applicable to all adolescents in LMICs, or Africa, or in Ghana. To develop appropriate public health interventions, it would be useful for future studies to explore body image and food choice perspectives of adolescents in different types of schools, settings (e.g., rural), and among those who do not attend school. Furthermore, it is possible that there could have been some recall bias in the answers provided by students, particularly when asked to describe and reflect on the quantity and quality of the foods
they consumed. Due to the ongoing COVID-19 pandemic, Ghanaian public health officials enforced strict guidelines such as mask mandates and social distancing in public places. As a result, the study team and student were both wearing face masks during the interview, which could have negatively affected data quality through two main pathways. The face coverings could have inadvertently left an uncomfortable psychological barrier between interviewer and student during the crucial stage of establishment of rapport. Face masks also may have hindered the team’s ability to read facial expressions of student and probe further based on responses. The interviewers tried to offset these limitations by spending more time interacting with the student about general topics before the official interview began. A final possible limitation to this study is that while English is the official language of instruction in Ghana, the ability of students to use this language to express their thoughts and ideas lucidly was variable. To address this limitation, the interviewers did member checking with the student and when necessary, probed further to obtain further clarification.

4.7 Conclusion

The growing obesity and NCDs crisis in LMICs, and in particular, Ghana, will be difficult to resolve without concerted efforts and multisectoral actions that account for sociocultural drivers of food choice, including body image aspirations. This study uncovered some important insights, particularly the tensions between ideal body image among younger and older generations and various misperceptions about weight, disease, and diet. Adolescent food choices are heavily influenced in their ideas about ideal body
size by their peers and the media but are constrained to act by various limits set forth by their families, either through financial resources or cultural norms.

Considering the pervasive influence of media on adolescents, future interventions could consider employing social marketing campaigns with celebrities to promote nutritious diets and physical activity, reduce stigma about body size extremes, and encourage body positivity and acceptance. Furthermore, creating culturally and age-appropriate messages about body positivity and healthy eating that could be delivered regularly should be prioritized in schools and in communities to create positive narratives around health and nutrition. The findings of this study underscore the importance of programs and interventions containing mental and physical health components to help empower adolescents to make healthier food choices and maintain a positive body image despite competing pressures from their social environments.

4.8 Acknowledgments

The MEALS4NCDs Project was funded by the International Development Research Centre (IDRC)’s Food, Environment, and Health Programme, IDRC-Canada (Grant ID: 108983). This work was partially supported by a SPARC Graduate Research Grant from the Office of the Vice President for Research at the University of South Carolina, Columbia, SC, USA. The authors would like to acknowledge the following MEALS4NCDs data collection staff members for their assistance in conducting these interviews, specifically Wilhemina Quarpong, Gideon Amevinya, Pearl Aovare, Keren-Happuch Obeku, Matilda Dery, and Marcella Ambenne.
4.9 References


Appendix 4.1: Sample questions from interview guide

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<tr>
<th>Part 1: Food literacy, food choice behaviors, and portion sizes</th>
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<tbody>
<tr>
<td>• Please walk us through your typical day of eating. What do you normally have for breakfast, lunch, and dinner?</td>
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<tr>
<td>• Please tell us using the modeling clay and/or portion size guide how much of X (interviewer to select a food item from list of foods student said they typically ate) you would typically eat.</td>
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<td>• When might you eat MORE of X (interviewer to select a food item from list of foods student said they typically ate)? Why?</td>
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<td>• When might you eat LESS of X (interviewer to select a food item from list of foods student said they typically ate)? Why?</td>
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<tr>
<td>• When you buy different foods or drinks, does the package size help you decide if you want to buy it?</td>
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<tr>
<td>• When you buy different foods or drinks, does the package size help you decide how much of the food to consume at one time?</td>
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<td>• How do you get money to buy food or drinks outside?</td>
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<td>• If you do not want to eat the food that is already prepared at home, what do you do?</td>
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<th>Part 2: Body image perceptions and food choices</th>
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<td>• Using the body silhouettes, which of these figures do you think shows a healthy girl (or boy)? Why do you think that?</td>
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<tr>
<td>• Using the body silhouettes, which of these figures do you think shows the most attractive girl (or boy)? Why do you think that?</td>
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<tr>
<td>• Which of these figures most resembles you?</td>
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<td>• If you could pick an alternative figure for yourself, which of these figures would you want to be? Why?</td>
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<tr>
<td>• Which of these figures would your friends or kids at school say that a girl (or boy) your age should look like? Why? Which of these figures would your</td>
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parents (or people in the household) say that a girl (or boy) your age should look like? Why?

- Who do you agree with the most about what a girl (or boy) your age should look like?
- What do you think about figure 1? Do you know anybody who looks like figure 1? What do you think they eat? What do you think about figure 18? Do you know anybody who looks like figure 18? What do you think they eat?
- Please tell us about a person who you admire because of their appearance. They can be famous or somebody you personally know.
- Do you or other kids your age ever change diets to look like someone whose body you (or they) admire? If yes, what changes do you make?
- You said you wanted to have a body like figure X. What types of foods/drinks could you consume to help you get to (or stay at) the figure you want to have?
- Do you ever increase or reduce the quantity of foods/drinks you consume to change your body size? What foods do you change? Why?

Part 3: Reactions to food and beverage advertisements and perspectives on food environments

- Please look at these food advertisements. Which ones are healthy and which ones are unhealthy in your opinion? Why?
- What is advertisement X (interview to select one at random) trying to tell you? What are their key messages?
- What do you think about the body sizes of the people in the advertisement?
- Do you or anyone you know compare your bodies to people you see in food and drink advertisements? In what ways?
- Do you or people you know purchase the products in the advertisements based on the models you see in the advertisements?
- How do you feel when you compare yourself to the models in the advertisements?
- Tell us where you have seen food and drink advertisements? Please give some examples.
- What is your opinion of the food environment in and around your school?
- Do you believe you have a healthy diet? Why or why not?
CHAPTER 5

URBAN GHANAIAN ADOLESCENTS’ PERSPECTIVES ON FOOD AND EATING: A QUALITATIVE STUDY

\[\text{1 Rampalli, K.K., Blake, C.E., Frongillo, E.A., Erickson, K.C., \\& Laar, A. To be submitted to \textit{Appetite}.}\]
5.1 Abstract

Background: Adolescents are vulnerable to diet-related health risks as they experience major life changes alongside food environment changes. In Ghana, non-communicable diseases (NCDs) are rising, and there is a need to understand what, how and why adolescents eat the way they do. This study explored perspectives of adolescents about healthy and unhealthy eating and their relationships to portion sizes.

Methods: We conducted 48 interviews with public school-going junior high students from six districts in the Greater Accra Region of Ghana from July-August 2020. Interviews were done in English, audio recorded, and transcribed verbatim. Transcripts were coded with NVivo 12 using a thematic analysis.

Results: All students showed basic nutrition knowledge. Healthy and unhealthy food and eating were conceptualized across three major domains: “food safety,” “functional aspects of health,” and “cultural or habitual practices.” These three domains were informed by opinions of those in their social networks as well as through various forms of food guidance they received in their environments. Connections between NCDs and consumption of foods high in fats, sugars, and salts were rarely made. All students consumed items contrary to what was described as a healthy diet. Students conceptualized portion sizes in terms of having various food categories in moderation or consuming a balanced diet, stating that they would consume smaller or larger portion sizes, such as around strangers (less) or unsure of next meal (more). Participants admitted that peer pressure and food advertising claims informed their food choices and showed minimal knowledge of marketing tactics. Citing financial and cultural constraints, students voiced their limited agency in food choice decisions, particularly in the home.
Conclusion: Students had some nutrition knowledge but lacked the agency to apply it in daily food choice decisions. Interventions should include strategies to improve media and health literacy among both students and parents, particularly with respect to deceptive marketing tactics and misinformation promoting unhealthy foods.

5.2 Introduction

The 2019 State of the World’s Children Report published by the United Nations Children’s Fund (UNICEF) show that as many as one-third of children are either undernourished or overweight and half of children suffer from micronutrient deficiencies, known as “hidden hunger” (Gödecke et al., 2018). In the sixteen-year period of 2000 to 2016, the prevalence of overweight children (ages 5-19 years old) worldwide increased from one in ten to one in five (UNICEF, 2019). The presence of multiple burdens of malnutrition, including underweight, overweight, and micronutrient deficiencies, are closely linked to the nutrition transition, defined by Popkin and colleagues as population-level dietary shifts happening in tandem with social, economic, and technological change (Blake et al., 2021; Drewnowski & Popkin, 1997; Popkin, 1998, 2001; Popkin et al., 2012). In recent decades, most low- and middle-income countries (LMICs) have undergone significant changes in food systems, including the widespread availability of inexpensive processed and ultra-processed foods containing high levels of refined carbohydrates, sodium, and saturated fats in their food environments (Holdsworth et al., 2020; Monteiro et al., 2019; Turner et al., 2018). A burgeoning middle class earning higher discretionary incomes in LMICs has also enabled the purchasing of items that
were previously inaccessible or believed to be “luxuries” (Blake et al., 2021; Fengler & Kharas, 2017; Kharas & Hamel, 2018; Kharas, 2010). This newfound purchasing power, combined with a higher number of both men and women working longer hours outside the home in both rural and urban areas, have influenced the opportunity cost of time for home food preparation and increased the demand for food convenience (Botonaki & Mattas, 2010; Celnik, Gillespie, & Lean, 2012; Contini, Boncinelli, Gerini, Scozzafava, & Casini, 2018; Hardcastle, Thøgersen-Ntoumani, & Chatzisarantis, 2015; Poti et al., 2015; Reardon et al., 2021). Food manufacturers and retailers have observed the heightened demand for food convenience and have continued to try to increase this demand through aggressive promotion of ready-to-eat meals, meals outside the home, fast and/or street foods, and pre-packaged snack foods and drinks (Baker & Friel, 2016; Monteiro, Levy, Claro, De Castro, & Cannon, 2011; Poti et al., 2015). In addition to the opportunity cost of time, consumers often favor processed or ready-to-eat meals outside the home because they are easy to find, can sometimes offer larger value per unit cost with larger portion or package sizes, can have longer shelf lives, and are largely palatable (Bucher, Collins, Diem, & Siegrist, 2016; Horning, Fulkerson, Friend, & Story, 2017; Monteiro et al., 2011; Reardon et al., 2021; Sheehy, Roache, & Sharma, 2013; Voorend et al., 2013). As the cost of processed and ultra-processed foods decreases worldwide, the cost of a healthy diet consisting of fresh fruit, vegetables, seafood, and meat has increased (FAO, et al., 2020; Raghunathan, Headey, and Herforth, 2021). Additionally, the widespread proliferation of supermarkets, hypermarkets, convenience stores, and other modern retail food outlets in LMICs have provided countless opportunities for
residents to access foods that were unavailable prior to globalization (Baker & Friel, 2016; Demmler et al., 2018; Kroll et al., 2019; Popkin et al., 2012).

Multinational as well as local food and beverage companies have invested significant resources in aggressive marketing of their products across various platforms, including television, social media, and outdoor promotions (e.g., billboards, posters) to make their products appealing to the masses (Amevinya et al., 2020; Green et al., 2018; Laar et al., 2020, 2021; Sousa et al., 2020; Truman & Elliott, 2019). These advertising campaigns have been successful at steering consumers from traditional, unprocessed, or minimally processed foods to diets characteristic of the global nutrition transition (Boyland et al., 2016; Popkin, 2017; Poti et al., 2015; Shaikh, Maxfield, Patil, & Cunningham, 2017; Smith et al., 2019; Vorster et al., 2011). Such marketing campaigns have public health implications, particularly in most LMICs with little to no regulations for the sale and promotion of unhealthy food and beverage products to the public, and particularly to children (Amevinya et al., 2020; Chacon, Letona, Villamor, & Barnoya, 2015; Kelly et al., 2013; L’Abbé et al., 2013; Smith et al., 2019; Truman & Elliott, 2019; Tsrah, Quarpong, Laar, 2020). Aside from frequent consumption of unhealthy energy-dense, nutrient-poor foods, low dietary diversity and minimal physical activity have been implicated in rising rates of childhood obesity and early adult onset of non-communicable diseases (NCDs) (e.g., type 2 diabetes, hypertension, cancer, cardiovascular disease) worldwide (Ford, Patel, & Narayan, 2017; Gouda et al., 2019; Monteiro et al., 2011; Prentice, 2006).

Although 90% of the world’s 1.2 billion adolescents (ages 10-19) reside in LMICs, they are an understudied segment of the global population with respect to food
choice behaviors (Caleyachetty et al., 2018; Salam, Das, et al., 2016). Most studies on food choice behaviors have focused on adult consumers alone or in the context of food provision for young children (Black et al., 2013; Boatema, Badasu, & De-Graft Aikins, 2018; Chakona & Shackleton, 2019; Flax, Thakwalakwa, Phuka, & Jaacks, 2020; Monterrosa et al., 2013; Reyes et al., 2021). Unhealthy eating habits developed in adolescence track well into adulthood, putting adolescents at risk of micronutrient and macronutrient deficiencies, as well as obesity, and various metabolic disorders later in life (Bhutta et al., 2013; Blum et al., 2019; Das et al., 2017; Salam, Das, et al., 2016). Childhood or adolescent overweight and obesity is a strong predictor of adult overweight and obesity and NCDs, including cardiovascular disease, type 2 diabetes, and hypertension (Simmonds et al., 2016). Thus, adolescence can be an important entry point for nutrition interventions and numerous studies have found that lifelong food-related attitudes and behaviors are formed during this time (Bassett et al., 2008; Bay, Morton, & Vickers, 2016; Das et al., 2017; Raphael, 2013; Story et al., 2002).

Adolescents often form identities and ideas about their own and others’ social status through their food choices (Bassett et al., 2008; Bisogni et al., 2002; Contento et al., 2006; Kroger, Martinussen, & Marcia, 2010; Maxfield et al., 2016; Story et al., 2002; Sturdevant & Spear, 2002). As this group progresses into adulthood, more food choice decisions are made outside their familiar home environments (Bassett et al., 2008; Contento et al., 2006; Wang & Fielding-Singh, 2018). Consequently, adolescents make food choices under less supervision from their parents or caregivers and more pressure from their friends and peers (Amos et al., 2012; Contento et al., 2006; Verstraeten et al., 2014; Voorend et al., 2013; Ziegler et al., 2021). As they are in the process of forming
identities and gaining more independence from parents and caregivers, adolescents often place a higher value on the ideas and opinions of their friends and peers and popular media (Bassett et al., 2008; Contento et al., 2006; Fernandes, Folson, Aurino, & Gelli, 2017; Kenny et al., 2017; Sadeghirad et al., 2016).

Although promotion of healthy eating for all age groups is critical to achieve the United Nations Sustainable Development Goals, there is sparse information on perspectives from adolescents in LMICs regarding healthy and unhealthy eating how this population interprets relationships between the quantity and quality of the foods they consume (Banna, Buchthal, Delormier, Creed-Kanashiro, & Penny, 2016; Crino, Sacks, & Wu, 2016; Powell, Durham, & Lawler, 2019; Sharif Ishak, Chin, Mohd Taib, & Mohd Shariff, 2020; Voorend et al., 2013). Yet, many interventions to promote sustainable healthy diets use models of health behavior change, such as Social Cognitive Theory (Bandura, 1986; Lee, Jeong, Ko, Park, & Ko, 2016; McCabe, Plotnikoff, Dewar, Collins, & Lubans, 2015), Theory of Planned Behavior (Ajzen, 1991; Alami et al., 2019; Grønhøj, Bech-Larsen, Chan, & Tsang, 2012), or the Health Belief Model (Keshani, Kaveh, Faghih, & Salehi, 2019; Rosenstock, 1974). These models operate on the premise that attitudes, beliefs, knowledge, norms, social support, and self-efficacy would determine an individual’s ability and intention to adopt and maintain various health behaviors (Draper, Grobler, Micklesfield, & Norris, 2015; Fishbein & Yzer, 2003; Nestle et al., 1998; Rundle-Thiele et al., 2019). While these health promotion models do provide important social and behavioral constructs that can be utilized in program development, they do have some critical limitations. They fail to account for behaviors performed for reasons other than health, such as social status or identity. The models also do not consider
environmental or economic contexts that could either facilitate or impede the adoption of health behaviors (Boston University School of Public Health, 2021). These two limitations are particularly important when considering food choice behaviors as most LMICs are undergoing significant social and economic changes alongside food environment changes. Thus, it is important that we have an adequate understanding and appreciation of beneficiaries’ perspectives, including their attitudes, beliefs, and knowledge of the issue at hand (e.g., diet-related NCDs). Without these perspectives, programs and policies will likely be unsuccessful in eliciting long-term behavior change at the population level.

Sub-Saharan Africa is currently experiencing a population boom, rapid urbanization, and drastic food environment changes alongside significant increases in obesity and diet-related NCDs. Ghana, a West African country of approximately 31 million, is not an outlier to these trends (Holdsworth et al., 2020; World Bank Group, 2020). As of 2016, 43% of Ghanaian adults were classified as either overweight or obese, with higher prevalence among urban dwellers and women (Ofori-Asenso et al., 2016). In 2019, in the urban Greater Accra Region of Ghana, there was an overweight prevalence of 46.9% among children aged 11-16 years old and an obesity prevalence of 21.2% (Ganle, Boakye, & Baatiema, 2019). This study used qualitative methods to gain an understanding of drivers of adolescent food choice and specifically, perspectives about healthy and unhealthy eating and relationships to food portion sizes of public junior high school students (ages 14-17 years old) in the urban Greater Accra Region of Ghana. The research questions were: 1) How do adolescents define healthy and unhealthy foods? 2) How do adolescents define food portion sizes? 3) In what settings or contexts are
different healthy and unhealthy food portion sizes consumed? and 4) What are the reasons that adolescents provide for selection of varying portion sizes of healthy and unhealthy foods?

5.3 Methods

This study was part of a comprehensive parent study conducted in the Greater Accra Region of Ghana, which is the second largest metropolitan area of the country and home to the nation’s capital. The parent study, called “Measurement, Evaluation, Accountability and Leadership Support for NCDs Prevention” (referred to as “MEALS4NCDs” or “MEALS4NCDs Project”), explored characteristics of urban food environments within and around children’s public schools to generate support for policies and interventions to reduce marketing and consumption of unhealthy foods and beverages. Further information about the MEALS4NCDs Project’s protocol, as well as adherence to ethics committee requirements can be found in additional published documentation on the study (Laar et al., 2021). Briefly, MEALS4NCDs used a cross-sectional mixed-methods study design based on modules from the International Network for Food and Obesity/NCDs Research Monitoring and Action Support to benchmark food environments, such as food promotion (INFORMAS, 2021). Typical MEALS4NCDs Project data collection activities included, but were not limited to, the following: advertisement and food vendor outlet mapping within 250 meters of school zones, television advertising monitoring, school headmaster interviews, supermarket inventories, and school pupil focus group discussions (Laar et al., 2021).
Whilst the MEALS4NCDs study deployed several data collection methods, this study used qualitative in-depth interviewing to glean perspectives from adolescents about healthy and unhealthy eating habits, including relationships to food portion sizes. A semi-structured interview guide containing potential probes was used for conducting interviews. There were three sections in the interview guide: (1) perspectives about healthy and unhealthy food and eating practices, perspectives about food portion sizes, and general food choice behaviors, (2) body image perceptions and food choices, and (3) reactions to food and beverage advertisements and perspectives on food environments (Appendix 5.1).

The interviewers for each MEALS4NCDs district were either site supervisors or data collectors who have had experience in qualitative research methods, including semi-structured interviews and focus groups. The lead researcher (KR) provided training to each interviewer on the aims of this study, including application of the interview guide and appropriate probing. Since Ghana is currently in the process of developing and validating food-based dietary guidelines containing recommended portion sizes of common foods, we used the existing Australian Food Guide as well as modeling clay in the first section of the interview guide as visual props to guide students in the discussion about eating habits and portion sizes (Aryetey, 2020; Australian Bureau of Statistics, 2014; Herforth et al., 2019). The Australian Food Guide was favored over other portion size estimation aids as their food images were simple and amorphous, easy for the student to understand, and well suited to the appearance of various local Ghanaian foods, particularly rice and other starchy staples. No quantitative dietary assessments were performed. In the second section of the interview, students were asked questions about
the influence of body image perceptions on their food choices. The final section of the interview included discussions with the student about how they interpreted sample food and beverage advertisements and the role those played in their personal body image and subsequent food choices.

The parent study recruited a total of 200 public basic (e.g., primary and junior high grade levels) schools from six districts of variable urbanization and poverty levels for research activities in the Greater Accra Region of Ghana (Figure 5.1) (Laar, et al., 2021).

Students were recruited through purposive sampling from the concurrently implemented parent study. Maximum variation sampling with the parameters of sex, age, observed body weight, and school size (defined as student body population at school).

Figure 5.1. MEALS4NCDs data collection sites, Greater Accra Region, Ghana (Ohene-Adjei et al., 2017)
The 2018 Greater Accra Region district roll size estimates for public basic and junior high schools, obtained from the Ghana Education Service, was used to determine the number of students to interview in each of the six districts participating in the study (Ghana Education Service Information Management System, 2018; Laar et al., 2021). In districts with smaller roll sizes, we interviewed fewer students than in districts with larger roll sizes. A total of 24 schools were recruited for this study and one male and one female junior high school student were interviewed in every school for a total of 48 one-to-one interviews. The students ranged in age from 14 to 17 years old.

Upon receipt of approval from both ethics committees, the research team enrolled students from Greater Accra public basic schools directly by requesting the school headmasters (or their designees) to nominate two junior high students from their school (one male, one female) whom they knew were able to communicate their ideas in English, were not shy around strangers, were available during the interview time, and met the other maximum variation sampling parameters of different observed body weights and ages (but must have been under 18 years old). This procedure was appropriate as the parent study was already interviewing school officials about school feeding programs at their institution and thus were already familiar with the ongoing research activities (Laar et al., 2021). Study information sheets and adult consent forms were supplied to school officials. The interviewer explained the nature of the interview questions to the student, who was also informed that while the interviews would be recorded, their identity and data would remain anonymous and confidential. The students were also reassured that they were not required to answer questions that made them feel were uncomfortable and that there would not be any problem if they chose to withdraw from the study at any time.
Before beginning the interview, the student was asked to read and sign an assent form indicating that they understood the nature of the study and agreed to participate.

Initially, the researchers planned to obtain parent or caregiver consent for the minor student to participate in the interview. Due to the COVID-19 pandemic, however, logistical issues emerged that resulted in significant challenges in completion of this task. The study team determined that to minimize exposure and infection risk to all parties involved, the school headmaster or designee would provide consent in lieu of the team visiting individual student homes to obtain parent or caregiver consent for student participation. Therefore, an amendment was submitted to the research ethics boards of the University of Ghana and the University of South Carolina seeking approval for this recruitment and consent procedure. Approval was granted by both institutions.

To capture interview content from interviewer and student, digital voice recorders were used. The lead researcher (KR) provided a clip-on microphone for students to attach to their shirt collars during the interview. Interviews were conducted in an empty classroom or office on the same school day that consent was obtained from the school head or their designee. COVID-19 safety protocols, including wearing of face masks and social distancing, were enforced by the study team. All interviewers who engaged directly with the students were Ghanaian staff members of the parent study. This was advantageous as they were able to consider the social and cultural contexts when interacting appropriately with the students. To build rapport, interviewers spent at least ten minutes before the official interview to casually converse with the student about sports, music, or other topics of interest. For the duration of the interview, the interviewer used member checking to paraphrase or summarize the student’s statements and would
ask the student for repeated confirmation of the accuracy of what was said. The lead researcher (KR) was also present during most of the interviews and took extensive field notes throughout on demeanor of student and interviewer, as well as other relevant observations. All interviews were conducted in English and lasted between 45-90 minutes. Each student was given a MEALS4NCDs-branded study t-shirt or notebook incentive upon completion of the interview. Interview audio files were downloaded onto an encrypted external hard drive and stored on Dropbox with limited access only provided to certain staff members on an as-needed basis. Recordings were deleted from recorders daily after ensuring they were saved in the designated secure locations.

Audio files of the interviews were transcribed verbatim, de-identified, and checked for accuracy by the lead researcher (KR). For data analysis and management, the transcripts were uploaded into NVivo 12 qualitative software (QSR International Pty Ltd, 2018). An inductive, thematic analysis approach in several stages was used to interpret findings. The first five high-quality transcripts, determined by the lead researcher (KR)’s field notes, were examined using open coding to create generalized categories (Corbin & Strauss, 2007; Creswell, 2012; Maxwell, 2013; Raskind et al., 2019; Strauss & Corbin, 1990). Upon coding the first five transcripts, the codes were reviewed by the other investigators for rigor and suitability. Focusing on the study aims, the researchers agreed about suitable categories to start building the codebook. Further codes were added or revised for the remainder of the transcripts through an iterative process. Next, axial coding was implemented in which codes and categories were linked together to show relationships among ideas in the data. Finally, we used selective coding to pull the themes and ideas into a plausible account (Strauss & Corbin, 1990).
During the coding and analysis process, sociocultural and environmental context that the students were providing their perspectives from was actively considered. The credibility of data interpretation was reinforced by having the interviewers review and revise the lead researcher (KR)’s field notes, when necessary. Member checking during the interviews and peer debriefing by discussing findings with MEALS4NCDs Project staff as well as other nutrition and food choice researchers was also done (Bisogni et al., 2002; Lincoln & Guba, 1985).

This study was approved by the University of Ghana Institute of Statistical, Social and Economic Research’s Ethics Committee for the Humanities (protocol #128/19-20) and the University of South Carolina’s Institutional Review Board (protocol #PRO00097113).

5.4 Results

The mean age of interviewed students was 15.60 ± 0.869 years old (Table 5.1). Half of the sample was female.

Themes that emerged from the data were placed into the following categories: 1) conceptualizations of healthy and unhealthy eating, 2) conceptualizations of portion sizes, 3) situations or settings where different portion sizes are consumed, 4) reasons for consuming different portion sizes, and 5) perceived degree of control in food choice decisions (Table 5.2).
Table 5.1. Demographic characteristics of students

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n (=48)</th>
<th>% (=100%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>24</td>
<td>50.0</td>
</tr>
<tr>
<td>Female</td>
<td>24</td>
<td>50.0</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>4</td>
<td>8.33</td>
</tr>
<tr>
<td>15</td>
<td>19</td>
<td>39.6</td>
</tr>
<tr>
<td>16</td>
<td>17</td>
<td>35.4</td>
</tr>
<tr>
<td>17</td>
<td>8</td>
<td>16.7</td>
</tr>
<tr>
<td><strong>District</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accra Metropolitan Assembly</td>
<td>12</td>
<td>25.0</td>
</tr>
<tr>
<td>La Nkwantanang Madina Municipality District</td>
<td>12</td>
<td>25.0</td>
</tr>
<tr>
<td>Ashaiman Municipality District</td>
<td>6</td>
<td>12.5</td>
</tr>
<tr>
<td>Kpone Katamanso Municipality District</td>
<td>6</td>
<td>12.5</td>
</tr>
<tr>
<td>Ga South Municipality District</td>
<td>6</td>
<td>12.5</td>
</tr>
<tr>
<td>Ningo Prampram District</td>
<td>6</td>
<td>12.5</td>
</tr>
</tbody>
</table>

Table 5.2. Themes and domains or subthemes

<table>
<thead>
<tr>
<th>Themes</th>
<th>Domains or subthemes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conceptualizations of healthy and unhealthy eating, based on:</td>
<td>Cultural/habitual eating practices</td>
</tr>
<tr>
<td>Food guidance</td>
<td>• “Not eating late”</td>
</tr>
<tr>
<td>• Media (television, radio, print news, books, internet/social media)</td>
<td>• “Not eating cold foods”</td>
</tr>
<tr>
<td>• Outdoor advertising</td>
<td>• “Not eating heavy foods”</td>
</tr>
<tr>
<td>• Health claims on packages</td>
<td>• “Not eating taboo foods”</td>
</tr>
<tr>
<td>• Ghana Food and Drugs Authority (FDA) approval</td>
<td>• “Not eating too much”</td>
</tr>
<tr>
<td>• School curricula</td>
<td>Functional aspects of health</td>
</tr>
<tr>
<td>• “What my doctor says”</td>
<td>• Eating “energy-giving” foods</td>
</tr>
<tr>
<td></td>
<td>• Eating “body-building” foods</td>
</tr>
<tr>
<td></td>
<td>• Eating “protective” foods</td>
</tr>
<tr>
<td></td>
<td>• Eating food containing “roughage”</td>
</tr>
<tr>
<td></td>
<td>• Eating fruits and vegetables</td>
</tr>
<tr>
<td></td>
<td>• Eating foods “with protein”</td>
</tr>
</tbody>
</table>
| Opinions of others in social networks | • Limiting foods with “a lot of fats and oils”  
| | • Drinking water  
| Food safety | • Trust in relationship with food vendor/venue  
| | • Eating food prepared in a “hygienic environment”  
| | • “Clean appearance of food vendor”  
| | • Food without artificial flavors or colors  
| | • Food not grown with pesticides/agrochemicals  
| | • Food free of adulteration or contaminants  
| Conceptualizations of portion sizes | • Balance of macronutrients  
| | • “Eat everything in moderation”  
| Situations or settings where different portion sizes are consumed | • “When I am with friends”  
| | • “When I am alone at home”  
| | • “During school breaks”  
| | • “Holidays,” “weddings,” “funerals,” or “special events”  
| | • “When we go eat at restaurants”  
| | • “At my auntie’s house”  
| | • “At church picnics”  
| Reasons for consuming different portion sizes | Larger portion sizes  
| | • Hunger  
| | • Unsure of when next meal will happen  
| | • Tastes or smells good  
| | • Avoid wastage  
| | • Boredom  
| | • “When food is plenty”  
| | • Desire to gain weight  
| | • “Winning a competition”  
| Smaller portion sizes | • Not hungry  
| | • Tastes or smells bad  
| | • Too expensive  
| | • Being forced to eat  
| | • Sick or unwell  
| | • Limited time to eat  
| | • Having to share
Theme 1: Conceptualizations of healthy and unhealthy eating

Students conceptualized healthy and unhealthy eating in three major ways: food safety, functional aspects of health, and cultural or habitual eating practices. These conceptualizations were informed by those in their social networks (e.g., their families, friends, and communities) as well as food guidance from external sources (e.g., school curricula, food marketing communications, government agencies, books, mass media (e.g., television, radio internet and social media), and other sources). Food safety concerns were articulated by students as fears of microbial contamination, food adulteration, and use of pesticides, agrochemicals, or artificial colors and flavors in foods. For example, two students opined about the food safety of items sold by various vendors outside their school environments:

“Outside the school they don’t seem to be healthy because of how its prepared and at times the position and way the food…sometimes the food will be nice but because of housefly and things around the food yes disease can be also gotten from it.”

(male, age 16)
“Like you see the beans, sometimes there is a stone inside. Like sometimes, maybe the one who is cooking the waakye [traditional rice and beans dish], she doesn't know it. They say that when you're eating the food, sometimes you're seriously eating the food, you will go and bite the stone. Sometimes it hurts and you see that there is stone in the food. When you see that several times, then you will not buy the food again.”

(female, age 16)

The domain of functional aspects of health was described by students as the actual micronutrients or macronutrients consumed and how those nutrients would affect their body structure, fitness, and appearance in both positive or negative ways. Nearly all students mentioned the importance of consuming “body-building foods,” which they understood to be meat, fish, and other foods containing protein, as well as “energy-giving foods,” such as rice or other carbohydrate-rich staples, and “protective foods,” such as fruits and vegetables. They believed that consumption of those categories of foods would enable them to grow “strong” and “fit.” For example, some students named specific food items and why they believed them to be healthy or unhealthy foods:

“I feel it [yogurt drink] contains some protein some nutrients which will help in the building of the --- because the banana is --- is an example of a banana-flavored drink so and the banana too contains vitamins and then that one too it will help to protect the body in some ways and also contains milk which falls under the protein aspect of food, that's why.”

(male, age 17)

“Then energy-giving food because if you don't have the energy there's no way --- because let's say if you don't have the energy every day, you are falling sick how can you become nice and fresh, so you need to take in energy-giving food like the cassava, maize and then other things.”

(female, age 16)
“I think the type of food, that's the nutrients—especially the fats and oil... because sometimes I used to watch this movie about food and nutrition the---a woman who was interviewed and then she said she eats a lot of like bread with margarine, so she likes oily foods, yes, and that's what has increased her weight”
(female, age 15)

The two major sources of information that students were through opinions of those in their social networks, such as their friends or their families. For example, this female student told us about what her mother told her about consuming excess sugar:

“So if you take the one that umm--- it contains lot of sugar, you are hurting yourself because too much sugar umm—I heard it gives white [candida infection]. That’s what my mother said. Yes, so too much sugar... sugar is not good.”
(female, age 15)

Ideas about healthy and unhealthy foods and eating were also derived from various forms of food guidance, including various media platforms, government agencies, school curricula, or from medical providers, particularly when it came to discussing their knowledge about food and disease. Here is an example:

“Yes, it's [sweet biscuit/cookie] healthy, because whenever they are doing the advert, they've been saying that it's tested and approved by the FDA [Ghana Food and Drugs Authority].”
(female, age 15)

Most students vaguely acknowledged connections between diet and NCDs and the effects of consuming foods containing a high level of sugar or fat. Health concerns that were brought up during the interviews included diabetes, hypertension, dental caries, and candida infections. No student interviewed for this study acknowledged the hazards of
excessive sodium consumption. For example, some students discussed the following conditions:

“I don’t know how to say it. Because umm because when you get too much oil in you, maybe it can… I don’t know how to say it. Maybe your heart… it can affect your heart or something.”

(male, age 16)

“It (cookies) contains too much sweet in it…it can cause cavity to my teeth.”

(male, age 15)

“To me, too much…. too much sugar is not good. You can get diseases like diabetes from it. And you can suffer from „„this one……high blood pressure if you take in too much sugar. So, I like to keep it low.”

(female, age 14)

Several students reported that they were swayed by health claims on food and beverage advertisements and saw it as a source of viable food guidance. Approximately half of the students stated that they read the nutrition labels on packaged food when available and based their conclusions about healthiness on the claims listed. In the case of instant noodles, the students who believed that this food was healthy mentioned that claims on the packaging might be evidence that the product had nutritive value. For instance, one student said:

**Student:** “Because they [*Indo Foods, manufacturer of Indomie instant noodles*] said Indomie taste it, taste great, then what, love it your way so…you know all the adverts that they have been doing. They do it to tell us it is good for your health.

**Interviewer:** Do you believe that it's good for your health?

**Student:** “When I look at the back of Indomie, they have written some nutrients and the amount in it. Outside there if it is true, then Indomie is good.”

(female, age 16)
Other students said that they took note of the physical appearance of the models in the advertisements and connected that to the healthiness of the promoted food. For example, one student said:

“Sometimes when we see advocates, we will be like and when the person is advertising on nutritious meal, we will be like, ‘oh the body structure even shows us that the person is, I mean, healthy so we should also practice it. We should practice eating the product.”
(female, age 15)

Food aesthetics was communicated as an indicator of the functional aspects of health that are contained in a food item. Students talked about how the external packaging was important to their assessment of the functional aspects of health of the food, as well as the texture, color, and aroma of the foods. Students that discussed food aesthetics had either positive or negative views about them. Some believed that foods containing “too many colors or chemicals” were unhealthy. For instance, one student said:

“…there are a lot of sugary in the cocktail and sometimes they have been adding color those kinds of… yeah, color to the drink. So I consume it less.”
(female, age 15)

Other students believed that the aesthetics of the packaging were attractive enough that they might be swayed to purchase the product. Here is one example:

“It's attractive [‘Fan Milk’ – ice cream and frozen dairy product]. The color of the Fan Milk. The combination of the colors used on the picture...pink, blue, and white. I want that.”
(female, age 16)
The final domain that students conceptualized healthy and unhealthy food and eating was cultural and habitual eating practices. These were described by students as the ways or items they consumed based on their cultural background or out of habits instilled upon them by their elders. For example, the Muslim students that were interviewed stated that they found pork to be unhealthy as their family’s religious beliefs consider it a taboo food and prohibit consumption. For example, one male student stated:

“I’m not supposed to eat pork and catfish. It’s haram…means food that you are not allowed to eat, like as a Muslim. It’s not healthy”

(male, age 15)

Theme 2: Conceptualizations of portion sizes

Students had limited concrete understanding of portion sizes and portion control. They framed their understanding of portion sizes in terms of consuming a “balanced diet” and that one should consume “everything in moderation.” There was little to no discussion by students of what types of foods should be consumed in larger portions and which foods should be consumed in smaller portions. For example, instant noodles [“Indomie”] were frequently cited as part of a balanced diet, but students asserted that the noodles from the package alone were not particularly healthy to consume on their own. However, when the popular method of preparation involves addition of various vegetables, meat, and eggs, approximately three-fourths of students stated that the entire meal was both “healthy” and “balanced.” The following are examples of student perspectives on the importance of keeping a balanced diet and eating in moderation:
“I don’t know the amount of liquid in the bottle, but too much of everything is not good. So I think you should take it in the right quantity.”
(male, age 14)

“I heard that when you… when you eat too much, you abuse the food. And when you eat less too, you abuse the food.”
(female, age 15)

“Like I said if you take the carbohydrate too much and there is no protein attached to it, you just get the energy but the things it brings up might make you sick or something like that.”
(male, age 16)

Theme 3: Situations or settings where different portion sizes are consumed

Students were asked about different contexts where they might alter the quantity of food they consumed. “When I am with friends,” “when I am alone at home,” “during school breaks,” “holidays,” “weddings,” “funerals,” “special events,” “when we go eat at restaurants,” “at my auntie’s house,” “at church picnics” were all examples of venues or circumstances where students would consume different amounts of food than normal.

Theme 4: Reasons for consuming different portion sizes

Students were asked about why they would take smaller or larger portion sizes at different times or settings. Most stated that they would take larger food portions when they were very hungry, unsure of when the next meal would be, the food tastes or smells “good”, avoiding food wastage, boredom, “when food is plenty,” a desire to gain weight, and “winning a competition.” For example, one male student talked about increasing his food portion consumption to win a competition:
“I eat more food with my cousins and brothers. Sometimes, I go on a bet with them that the one who will finish eating…who will take much food and finish first will be the winner.”

*(male, age 15)*

Few students reported that they would take larger portion sizes of food around others who were not their family and attributed that to peer influence. For example,

> **Interviewer:** When you’re with friends, do you find yourself eating more than what you usually eat?

> **Student:** Yeah…It’s because when you’re walking with friends, they sometimes buy things and you’ll also feel like buying”

*(male, age 14)*

> “When I see them [friends] taking snacks, it’s like they are calling me to also join them so I will definitely go and have some.”

*(female, age 15)*

When asked about reasons for consuming smaller food portions, students commonly talked about not being hungry, not liking the taste or smell of the food, not having enough money, being sick or unwell, being “forced to eat,” having limited or no time to eat, a desire to lose weight, participating in physical activity, and having to share food with others. For instance, this male student discussed needing to eat less prior to engaging in physical activity:

> “Maybe at times like if you are going to pool site or even let’s say the beach, you are going to swim; I just don’t like to take many foods, I just want to take something small”

*(male, age 16)*

Nearly all students said that they felt shy and worried about what other people might say about the quantity of food they took so they kept their portion sizes small around people who were not in their household. Female students were more concerned
than male students about saving face around others, although males also expressed concerns about how others might perceive the amount of food that they consume during an eating occasion. For instance,

“I will take more alone...because when I’m with my friends, when you...you take a lot of food, some of them will laugh at you and say you eat a lot.”
(female, age 16)

“I eat more food when I’m alone...because I have the liberty to eat any how I want to eat. But when I’m outside, it’s like, I have to be ladyish and I have to know how to eat.”
(female, age 14)

“Student: I’ll eat more when I’m alone. Because there I can have my privacy. When you’re with your friends and you’re eating more, they know that you’re a glutton...they make comments; ‘aye this guy likes food ooo’. Even when you’re eating it he wouldn’t allow you to also eat. Uh huh. So they’ll make comments.
Interviewer: Ohh, what have they said? They say you’re a glutton?
Student: Yes, they say you’re a glutton because you eat more than them...Because when you’re eating with your friend, you know how much you can eat. Sometimes, when they’re eating they’ll be like; ‘I’m satisfied’. They’ll be like they’re satisfied and you’ll be like; ‘oh, I still want more’. Especially when you go to the chop bar and still request for more, they’ll be like; ‘wow, this guy can eat’. Then they’ll call your name.”
(male, age 16)

**Theme 5: Perceived degree of control in food choice decisions**

Over half of the students reported low control over their food choices, particularly in the home environment. The two major reasons for this were cultural (e.g., it would be disrespectful to refuse food that a parent or caregiver provided) and financial (e.g., do not have enough money to purchase preferred foods). Among the students who stated that they had no control over the food choices made at home, most said they would just eat
whatever was provided, but perhaps in smaller portion sizes if it was a dish they did not particularly prefer. For example:

“You still have to eat it anyway because probably if she didn’t prepare the food, she’ll give you money to go and buy one of your choice. But since she has prepared it, she’s not going to give you money to go and buy one of your choice. You’ll have to eat or not to eat.”
(male, age 16)

“At home, sometimes I don’t feel hungry and until I’m hungry I won’t eat. Or the food available, for instance; yam, I don’t like yam. So normally I don’t eat it until I’m really hungry, then I’ll take maybe two of them to eat.”
(female, age 17)

Among the students who described having more agency in food choice at their households, most opted for purchasing prepared food outside the home, cooking something else they preferred, eating leftovers from a previous day, snacking, or skipping the meal altogether if the food available was not to their liking. Some characteristic statements included:

“Actually, if there is something else-- something else like rice in the house, I will boil it myself then take it. Maybe she [grandmother] is tired preparing a different food, so I will do it myself.”
(female, age 15)

“I go outside and buy food or at times, if its food like kokonte [pounded dried cassava], I don’t like kokonte. We have some rice there, I can prepare the rice and leave the kokonte…my mum will give me money.”
(male, age 16)

In the school environment, students reported that they had more control over their food choices, due to the variety of food vendors within and around the school environment. Most students were still constrained by the amount of time allotted to find
and consume food during school hours and amount of money they were given daily. Nearly all students expressed concerns about food safety and hygiene from the vendors within and around their school environments.

5.5 Discussion

This qualitative study provided a detailed account of drivers of adolescent food choice, particularly perspectives about healthy and unhealthy foods, eating, and interpretation of portion sizes among junior high school students attending public schools in six urban districts of the Greater Accra Region of Ghana. Overall, students possessed some nutrition knowledge; nearly all could articulate the necessity of maintaining a balanced diet and obtaining all the essential nutrients through consumption of fruit, vegetables, meat, dairy, and grains while limiting intake of sugars and fat. Despite having reasonably accurate knowledge about nutrition and healthy foods, the students described other cognitive or personal motivators for their food choices that took precedence over healthiness. Some of those drivers of food choice included hunger, taste, cost, convenience, and sociocultural factors such as familial or peer pressure. These findings are similar from prior studies with adolescents in both high-income countries and LMICs (Amos et al., 2012; Banna et al., 2016; Bekker, Marais, & Koen, 2017; Chan, Tse, Tam, & Huang, 2016; Correa et al., 2017; Dapi, Omoloko, Janlert, Dahlgren, & Håglin, 2007; Fitzgerald, Heary, Nixon, & Kelly, 2010; Kinard & Webster, 2012; Sedibe et al., 2014; Sharif Ishak et al., 2020; Story et al., 2002; Verstraeten et al., 2014; Voorend et al., 2013).
Students had a rudimentary understanding of the importance of portion size in food consumption and the relationships between portion size, nutrition, and disease. In this study, we asked the students to estimate the portion sizes of foods that they regularly consumed and talk about where, when, and why they consume different food portions in various scenarios. Studies have shown that while photographic visual aids can be helpful in accurate estimation of consumed quantities, but substantial variability tends to exist at the individual level, so the accuracy of their estimates is unknown (Lillegaard, Øverby, & Andersen, 2005). Several students stated that they believed that “eating too much” could potentially lead to weight gain, and that “too much of anything is bad,” but they had low awareness of specific foods or drinks that generally require more mindful consumption and portion control (e.g., energy-dense and/or nutrient-poor, processed, and ultra-processed foods). Over the last several years of the global nutrition transition, portion sizes have increased across the board but the level of consumer awareness of these packaging trends and their implications for health is limited (Livingstone & Pourshahidi, 2014; Nielsen & Popkin, 2003). Portion size research suggests that some consumers may even consider these larger portion sizes as sufficient or normal for their eating occasions (Colapinto et al., 2007; Schwartz & Byrd-Bredbenner, 2006). While several high-income countries have food-based dietary guidelines, Ghana is still currently in the process of developing and validating them (Aryeetey, 2020; Herforth et al., 2019). In the future, it would be useful to incorporate these food-based dietary guidelines that provide detailed information about the recommended quantities of different food groups into the basic school curriculum to help students understand how and why they must pay attention to their food portion consumption. Efforts must also be made to disseminate the food-based
dietary guidelines into the major platforms that children and adolescents consume, such as television and social media. Once food-based dietary guidelines are integrated into the curricula and disseminated more broadly in Ghana, it would behoove the public health community to evaluate the effectiveness of these guidelines in augmenting food choices for this population.

The interviewers had engaging conversations with students about situations and settings in which different food portion sizes were consumed. Many of those conversations pointed to gendered differences in food choice, particularly with respect to portion sizes and dieting. While students of both sexes told us that they would eat smaller portion sizes when around other people, it was predominantly female students who stated discomfort with others watching them eat. For example, a female student had told us that she needed to appear “ladyish” around others and therefore would eat sparingly to avoid potential social stigma around appearing gluttonous. Additionally, female students in general appeared more cognizant of and more willing to make healthier food choices than male students. One potential explanation for this could be related to increased societal pressure to maintain a certain body size and shape that fits in with expectations of male and female figures. This fits with prior food choice studies in high-income countries that uncovered aspects of individual identity in food choice behaviors, including the ideas of “masculine” and “feminine” foods and even among children as young as four all the way through adolescence (Bisogni et al., 2002; Cooke & Wardle, 2005; Devine, Connors, Bisogni, & Sobal, 1998; Devine, Sobal, Bisogni, & Connors, 1999; Monterrosa, Frongillo, Drewnowski, de Pee, & Vandevijvere, 2020; Wardle et al., 2004). Considering the overwhelming evidence that one’s lifelong dietary habits are formed during
adolescence, it is important to account for aspects of identity, including gender norms, which may play a significant role in food choice decision-making. Future studies may consider exploring the evolution of identities through food and how those identities might shape food choices for adolescents in countries like Ghana which are undergoing rapid social, demographic, and technological changes alongside food systems changes.

During the interviews, we asked the students what their sources of credible information on nutrition and health were. Nearly all the students reported that they learned technical information about macronutrients and disease from their school curricula, whereas information about eating practices, such as meal timing or food taboos, largely came from their social networks (e.g., family and friends) and to some extent, the popular media (television, social media, and internet). Over three-fourths of the students believed that they had a healthy diet because the food they were provided with at home and the foods they purchased were in accordance with the ideas presented to them by their information sources that they deemed to be credible. While much of the information provided by their school curriculum was accurate, some of the information from their social networks (e.g., friends, family), food advertising (e.g., health claims on packaging), and the media (e.g., television, internet, outdoor advertising) were more questionable in terms of accuracy. For example, most students in this study believed that instant noodles or biscuits [cookies] were healthy and acceptable foods to consume regularly because those in their social networks either told them or role modeled those food choices. Nutrition experts would argue, however, that both instant noodles and biscuits provide meager nutrition and are known contributors to obesity, NCDs (Huh et al., 2017). Prior studies examining where adolescents obtained trusted nutrition and
health information found that social networks (particularly mothers and elder family members), followed by popular media were favored sources, followed by healthcare workers and teachers (Brown et al., 2015; Freisling, Haas, & Elmadfa, 2010; Kundu et al., 2020; Wang & Fielding-Singh, 2018). In Ghana, the use of online sources (and especially social media) for health and nutrition information have also gained significant traction in recent years among young people (Quaidoo, Ohemeng, & Amankwah-Poku, 2018). Eliminating misinformation about health and nutrition is a challenge in any society and underscores the need for tailored, age and culturally appropriate and sustainable public health campaigns that seek to provide and reinforce reliable information in a nonjudgmental, non-punitive fashion.

A recurring idea mentioned by students was around the significance of food aesthetics, including texture, appearance (including external packaging design), smell, and taste. Students talked about being drawn to foods that had favorable food aesthetics and that this influenced their preferences for certain food products or food brands. This is unsurprising as it has been well established that over the last few decades, the food industry has refined their marketing content to appeal to younger populations in LMICs using attractive promotions and packaging, particularly for selling extremely palatable, energy-dense, and nutrient-poor foods and drinks (Boyland et al., 2016; Chacon, Letona, & Barnoya, 2013; Lavriša & Pravst, 2019; McGale, Halford, Harrold, & Boyland, 2016; Smith et al., 2019). The students in this study also indicated that many of their food purchasing decisions were unplanned and occurred at the point-of-sale, which in most cases would be a provision shop, roadside vendor, or street hawker. This suggests that attractive packaging may play a larger role in food choice decisions than initially thought.
Studies have found that both children and adolescents are vulnerable to the persuasive effects of unhealthy food and beverage promotions that contain licensed characters, colors, and other attractive images that produce a positive emotional experience in their minds (Hallez, Qutteina, Raedschelders, Boen, & Smits, 2020; McGale et al., 2016; Smith et al., 2019; Stevenson, Doherty, Barnett, Muldoon, & Trew, 2007). As it currently stands, there is a dearth of evidence about the characteristics of and degree to which food aesthetics may drive adolescent food choices in LMICs such as Ghana that are in an intermediate stage of the nutrition transition and witnessing rapid changes in their food environments.

Most students indicated they had little control over food decisions made in their household and had to eat whatever was prepared by their caregivers. At school, however, they reported having a lot more agency and freedom to choose what foods they consumed within their daily budgets. Having more choices in the school food environment presents opportunities to nudge students toward healthier food choices by exposing them to more nutritious options. Given that the students had derived much of their nutrition knowledge from their teachers, the school setting may be an appropriate place to implement food environment interventions, provided there is ample support and readiness to act on improving children’s diets by school personnel, the community at large, health system, and parents (Pradeilles et al., 2019; Shinde, Wang, & Fawzi, 2021; Van Cauwenberghe et al., 2010).

One of the most significant concerns and drivers of food choice expressed by students was food safety. The students in our study discussed their impressions of the food environments in and around their schools, predominantly in terms of hygiene and
sanitation as well as food adulteration issues that they believed affected the healthiness of the food available and influenced their food choices. None of the students interviewed talked about the healthiness of foods in their food environments in terms of nutritional content. In Ghana, there are widespread beliefs that processed foods are healthier than fresh foods due to their industrial processing and packaging which is thought to render the food free of environmental or microbial content (Omari & Frempong, 2016; Ragasa, Andam, Amewu, & Asante, 2019). A potential explanation for the belief that food healthiness is related to food safety might be related to the long history of foodborne disease in LMICs, which have very clear symptoms such as vomiting and diarrhea and are a leading cause of mortality for young children, elderly, and immune-compromised individuals (Black et al., 2013; Grace, 2017; Omari & Frempong, 2016; Rheinländer et al., 2008; World Health Organization, 2015). Contrasting infectious foodborne illnesses, obesity and diet-related NCDs are a relatively new phenomenon in LMICs. With cultural norms favoring larger body sizes in Africa, the perceived threat of obesity and diet-related NCDs is much lower (Appiah et al., 2016; Bosire et al., 2020; Cohen et al., 2013; Ettarh et al., 2013; Okop et al., 2016). Beliefs that food safety are signifiers of food healthiness was also common in prior studies in both high-income and LMICs (Grace, 2015; Grunert, 2005; Speed, Meyer, Hanning, & Majowicz, 2017; Stenger, Ritter-Gooder, Perry, & Albrecht, 2014; Wertheim-Heck et al., 2019). This underscores the need for food policies that better regulate school food environments, including the sales of unhealthy food and drinks, as well as nutrition education programs that raise awareness of the dangers of processed foods and incentivize healthier food choices.
The study site was in Ghana, an LMIC in West Africa, that is in an intermediate stage of the nutrition transition. There is widespread proliferation of unhealthy food and beverages within and around schools, with little to no policies to regulate sales to minors, but little information on drivers of food choice from adolescents who are important consumers of such products (Fernandes, Folson, Aurino, & Gelli, 2017; Mensah, 2015). Other studies in LMICs have gleaned adolescent perspectives about healthy food, but to our knowledge, this is the first study that has also sought to understand the extent to which and in what ways students interpret portion size in their food choice behaviors.

An important limitation of this study was the sample itself. We limited the study population to public junior high school students in six urban districts of the Greater Accra Region of Ghana. We did not interact with similarly aged private school students, non-school attending adolescents, or students residing in other parts of the country (e.g., rural Ghana, other districts in the Greater Accra Region). Chances are those children may also have some degree of exposure to food environments that are rapidly changing in accordance with the nutrition transition and might have differing perspectives on healthy and unhealthy eating. Therefore, some of our findings might not be generalizable to all adolescents in LMICs, or in Africa, or even in Ghana. When devising nutrition-sensitive interventions to address the growing burden of NCDs in LMICs, future studies would need to explore the perspectives of this age group in different types of schools, environments, and for those who do not attend school. Another potential limitation we have identified is the possibility of recall bias from students during the interview when they were asked to recall and reflect upon the foods they typically ate. A final limitation of this study was that while English is technically the official language of Ghana and is
widely used in schools and workplaces, the fluency was variable among the students, with some more expressive than others. To address this limitation, the interviewers probed extra when needed and conducted member checking during the interview to obtain clarification. Lastly, as we limited the interview participation to students who were available during the interview time, less shy around strangers, and able to communicate their ideas in English could have also introduced some selection bias in the study. We tried to limit the effect of these biases by using maximum variation sampling in subject recruitment and interviewing a significant number of students (n=48) to reach saturation.

Additionally, we conducted this study during the ongoing COVID-19 pandemic, which posed some unique challenges. For instance, safety precautions such as the use of face coverings and social distancing in public settings, were necessary during data collection activities. The face coverings could have unintentionally impeded the rapport building between student and interviewer and somewhat limited the reading of student body language during the interview. On the other hand, the face coverings could have also helped demure students to speak freely. The effect of these measures on the dynamics between interviewer and student is not known.

5.6 Conclusion

School-going adolescents had some technical knowledge about macronutrients in various foods, but the application of their technical knowledge in their daily life was constrained by social and cultural influences and practical considerations such as cost. Their beliefs about health and nutrition were influenced predominantly by their families, friends, and media sources, even if the accuracy of those sources was less than that of
their school curricula. The importance of food portion control and mindful eating was only slightly alluded to by students, but a complete and coherent understanding was not present. The findings from this study shine light on the importance of providing both students and their caregivers with correct information about health and nutrition, including the benefits of healthy eating, ways to incorporate healthier foods into their diets, simple information about portion control and mindful eating, and deceptive marketing techniques used by food companies. The perspectives gleaned from this study can potentially aid in the development of interventions and policies that could help encourage children and adolescents to make better food choices.

5.7 Acknowledgements

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5.8 References


Appendix 5.1. Sample questions from interview guide

<table>
<thead>
<tr>
<th>Part 1: Food literacy, food choice behaviors, and portion sizes</th>
</tr>
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<tbody>
<tr>
<td>• Please walk us through your typical day of eating. What do you normally have for breakfast, lunch, and dinner?</td>
</tr>
<tr>
<td>• Please tell us using the modeling clay and/or portion size guide how much of X (interviewer to select a food item from list of foods student said they typically ate) you would typically eat.</td>
</tr>
<tr>
<td>• When might you eat MORE of X (interviewer to select a food item from list of foods student said they typically ate)? Why?</td>
</tr>
<tr>
<td>• When might you eat LESS of X (interviewer to select a food item from list of foods student said they typically ate)? Why?</td>
</tr>
<tr>
<td>• When you buy different foods or drinks, does the package size help you decide if you want to buy it?</td>
</tr>
<tr>
<td>• When you buy different foods or drinks, does the package size help you decide how much of the food to consume at one time?</td>
</tr>
<tr>
<td>• How do you get money to buy food or drinks outside? If you do not want to eat the food that is already prepared at home, what do you do?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part 2: Body image perceptions and food choices</th>
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<tbody>
<tr>
<td>• Using the body silhouettes, which of these figures do you think shows a healthy girl (or boy)? Why do you think that?</td>
</tr>
<tr>
<td>• Using the body silhouettes, which of these figures do you think shows the most attractive girl (or boy)? Why do you think that?</td>
</tr>
<tr>
<td>• Which of these figures most resembles you?</td>
</tr>
<tr>
<td>• If you could pick an alternative figure for yourself, which of these figures would you want to be? Why?</td>
</tr>
<tr>
<td>• Which of these figures would your friends or kids at school say that a girl (or boy) your age should look like? Why? Which of these figures would your parents (or people in the household) say that a girl (or boy) your age should look like? Why?</td>
</tr>
<tr>
<td>• Who do you agree with the most about what a girl (or boy) your age should look like?</td>
</tr>
</tbody>
</table>
• What do you think about *figure 1*? Do you know anybody who looks like *figure 1*? What do you think they eat? What do you think about *figure 18*? Do you know anybody who looks like *figure 18*? What do you think they eat?
• Please tell us about a person who you admire because of their appearance. They can be famous or somebody you personally know.
• Do you or other kids your age ever change diets to look like someone whose body you (or they) admire? If yes, what changes do you make?
• You said you wanted to have a body like *figure X*. What types of foods/drinks could you consume to help you get to (or stay at) the figure you want to have?
• Do you ever increase or reduce the quantity of foods/drinks you consume to change your body size? What foods do you change? Why?

**Part 3: Reactions to food and beverage advertisements and perspectives on food environments**

• Please look at these food advertisements. Which ones are healthy and which ones are unhealthy in your opinion? Why?
  
  • What is advertisement *X* (interview to select one at random) trying to tell you? What are their key messages?
  • What do you think about the body sizes of the people in the advertisement?
  • Do you or anyone you know compare your bodies to people you see in food and drink advertisements? In what ways?
  • Do you or people you know purchase the products in the advertisements based on the models you see in the advertisements?
  • How do you feel when you compare yourself to the models in the advertisements?
  • Tell us where you have seen food and drink advertisements? Please give some examples.
  • What is your opinion of the food environment in and around your school?
  • Do you believe you have a healthy diet? Why or why not?
CHAPTER 6

SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

6.1 Summary of Major Findings

The overall goal of this study was to gain a more in-depth understanding of how school-going adolescents make food choice decisions within their personal and external food environments and sociocultural context, with an emphasis on healthy and unhealthy food and portion sizes, body image perceptions, and food advertising. Qualitative in-depth interviews with the students were used as the data collection method. The interview guides and subsequent probes were informed by an extensive literature review, current and historical frameworks on food choice and food environments, and in consultation with subject matter experts and the committee.

The first objective of this study was to understand urban public junior high school students’ perspectives on healthy and unhealthy foods and eating practices, how they interpret portion sizes, and the reasons why they consumed different portion sizes in different situations. Considering that real and perceived health value of food is an important food choice consideration across all population groups, this was an important area of inquiry to understand among this population. Using in-depth interviews, we
identified four major themes: 1) conceptualizations of healthy and unhealthy eating, 2) conceptualizations of portion sizes, 3) situations or settings where different portion sizes are consumed, 4) reasons for consuming different portion sizes, and 5) perceived degree of control in food choice decisions. We found that students did indeed have a grasp of basic concepts about nutrients and food composition, including the importance of proteins, fats, carbohydrates, and vitamins/minerals in improving as well as maintaining bodily functions. The application of their nutritional knowledge into their actual eating behaviors were constrained by various social and cultural factors, such as food taboos, and practical considerations such as cost. Overall, students conceptualized healthy and unhealthy foods and eating across three major domains: food safety (e.g., aspects of food hygiene, concerns about food adulteration, and vendor trust), functional aspects of health (e.g., how specific nutrients in the foods help the body), and cultural or habitual eating practices (e.g., religious taboos or eating customs within a family or community). The beliefs and attitudes about healthy and unhealthy food and eating that the students had were derived from opinions and perspectives of those in the students’ social networks, particularly their families and friends. Various sources of food guidance, including the media, school, books, government agencies (such as the Ghana FDA) were also influencing perspectives of students. Portion sizes were conceptualized along the lines of consuming a balanced diet and eating anything but in moderation. Students displayed minimal knowledge about diet-related NCDs and were unaware of deceptive marketing by food and beverage companies that make various health claims of their products. In different settings and situations in their environments, students indicated that they would augment the quantities of food they ate and stated various reasons for those changes,
including aesthetic aspects of the food, hunger, avoiding food waste, desiring to gain or lose weight, peer pressure, and being unsure of when next meal would happen, to name some reasons. Lastly, students described having limited latitude in making food choices, particularly at their households, where most stated that they had to eat whatever food was provided due to cultural or financial constraints.

The second objective of this study was to examine body image perceptions and the role these perceptions play in food choice decision-making. The responses from the semi-structured interviews provided rich descriptions of how students conceptualized attractiveness and unattractiveness, body image aspirations, various positive and negative influences on their body image, and the role of body image in food choice decision-making. Aspects of attractiveness for both sexes included both physical characteristics such as fitness and muscularity, tall stature, as well as non-physical characteristics, such as wealth. These ideas were derived from their peers and popular media; students believed that attractiveness was directly related to one’s success in life. Female students and those who were younger expressed higher levels of body image dissatisfaction and disordered eating behaviors than male students and older adolescents that were interviewed. Nearly all the students interviewed in this study described having conflicting viewpoints about ideal body size with their parents and other elders, who supported traditional African beliefs that larger body sizes were indicators of health and wealth. Students also discussed ways in which they would modify their food choices to change their body sizes or to emulate someone whose body figure they admired. Such activities included going on diets and reducing or increasing portion sizes of various food items they believed would help them achieve their desired body size. Despite their wishes to
possess a certain body figure, adolescents were constrained in their food choices by various cultural or practical limits set forth by their caregivers.

6.2 Strengths and limitations

This study was an exploration of the perspectives on healthy and unhealthy foods and eating habits, including portion size interpretations, as well as body image, and general drivers of food choice of public school-going adolescents in urban Accra, Ghana. Adolescents in LMICs are generally understudied in global health, which has implications for the world’s population which is expected to grow significantly in the coming decades. Ghana, as a country in the intermediate stage of the nutrition transition, is facing multiple burdens of malnutrition and NCDs. Significant changes in food systems at the macro-level have engendered changes at the micro-level in personal and external food environments, offering consumers access to previously unattainable food and beverage options. Having significant variety of foods in the food environment has some advantages, but actions are needed to reduce multiple burdens of malnutrition in Ghana. For both the first and second aims, an interview guide was developed that provided key opportunities to probe the students for what, how, and why they ate the ways they did to understand the influence of popular media, food advertising, and body image on their food choice decisions. The rich perspectives that we obtained from students were possible with a qualitative approach using the in-depth interview. Historically, most body image studies focus on female body dissatisfaction and eating disorders. In this study, we chose to speak to both male and female students about this topic. We did not supplement this study with quantitative measurements of the students’
height and weight, which likely enabled them to feel more comfortable talking about sensitive topics without being judged. This study was conducted as an addition to a larger parent study, which was advantageous as the study had already obtained public support, including from the government, for the data collection activities. This made community entry significantly less complicated. We spoke to the students about body image and the role of those perceptions in their food choices, which included a discussion about the impact of attractive models promoting unhealthy foods. This is the first qualitative study, to our knowledge, that sought to connect adolescent body image perceptions to food marketing and food choice decision-making in an LMIC. A final strength was that we spoke to students about both quality and quantity of food through our discussions about portion size. While there have been other studies in LMICs about perspectives on healthiness of food, this is the first study, to our knowledge, that sought to understand the extent to which adolescents understood and applied portion control and mindful eating behaviors to their daily lives.

This study was limited by the type of students that were interviewed. We restricted our sample to public junior high school students in six urban districts of the Greater Accra Region of Ghana. We did not interview private school students, adolescents who were currently not attending school, and those residing in other parts of the country of the same age as our sample, including in rural Ghana and in the remaining districts in the Greater Accra Region. As Ghana’s food environments are rapidly changing, children and adolescents of all ages will likely have had some level of exposure to obesogenic food environments. Depending on various social, cultural, and practical factors, those adolescents might have significantly different perspectives about
healthy and unhealthy eating and body image. We were also limited to junior high school students in our sampling, which is a relatively small age range. Future studies may consider obtaining perspectives from primary school students as well as senior high school students, several of which who may be within the age range of adolescents per the World Health Organization’s definition of people of ages 10-19. Thus, some findings presented here might not be generalizable to all adolescents in LMICs, Africa, Ghana, and even within the Greater Accra Region, which is a large and diverse part of the country. As practitioners design nutrition-sensitive interventions for addressing NCDs in LMICs, future work must also consider perspectives of this age group in different contexts. Another potential limitation is the possibility of recall bias from students during the interviews as they were asked to recall and reflect upon the quantity and quality of foods that they typically ate. As this was a qualitative study and not an observational or intervention study, this bias was not a source of concern and the answers provided by students about their typical diets were only used to guide the discussions. One other issue to note is that we purposively selected students that were available during the times we were at the schools, not shy to speak with strangers, and were willing and able to express themselves coherently in English. Even though the English language is the official language of Ghana and is widely taught in schools from a young age, public school-going students have variable levels of fluency. Future studies may consider interviewing students who might be less fluent or confident in their abilities to express their thoughts in English (e.g., conduct the interview in another local language) and those who are potentially available at other times of the day (e.g., at after school activities) and year to see if there are seasonal differences in perspectives. This study was also cross-sectional,
so various causal inferences cannot be made. We interviewed students the same day that consent was obtained by the school headmaster, which meant that we only had one specific data collection time point. Future studies should consider interviewing students at different times of the year and under different circumstances that might potentially elicit different narratives.

The data for this study was collected during the COVID-19 pandemic, which had presented various logistical challenges. Both student and interviewer needed to maintain six feet of social distance and wear face coverings. We are unsure of the effect of the face coverings on the interviews and relationships between interviewer and student. Face coverings could have unintentionally diminished both the interviewer’s and student’s abilities to read each other’s facial expressions and could have impeded rapport building. Students who were especially timid or reserved might have benefitted more from the facial coverings by hiding their expressions while they spoke. The COVID-19 safety measures could have had either a positive or negative effect, depending on student and on interviewer, but we do not know the extent to which the study was affected by these necessary actions.

6.3 Conclusion, implications, and recommendations for future research

Understanding what, how, and why adolescents make the food choices they do amidst the nutrition transition in an LMIC such as Ghana has consequences at the population health level. Adolescents are becoming an increasingly large proportion of the world’s population, particularly in LMICs (Patton et al., 2016). Considering that many
health systems in LMICs are ill-equipped to manage the massive uptick of diet-related NCDs among their populations, it is important that there are concerted efforts made to prevent, rather than treat, diet-related NCDs (Allotey et al., 2014; Kankeu et al., 2013). The local food environments where the adolescents exist in are heavily populated with larger portion and package sizes of foods that have minimal nutritional value, and in many cases, contain ingredients that are closely linked to the development of diet-related NCDs (Holdsworth et al., 2020; Laar et al., 2021). The meal patterns identified in prior studies were consistent with the meal patterns that we observed among this population, particularly the first pattern that involved high consumption of energy-dense, typically processed, and ultra-processed foods that were readily available in and around the various school food environments we encountered (Ogum Alangea et al., 2018). Prior studies on food choice among adult consumers in urban Africa had found that adult consumers ate a standard of three meals per day and minimally snacked. Those in our study population admitted to skipping meals and snacking more frequently. This could potentially be related to the fact that they have more freedom to make their independent food choices in the school environment compared to at home, and as we were told by some students, swayed by what their friends and peers would purchase, and several had the time and funds to make their own purchases (Fernandes, Folson, Aurino, & Gelli, 2017; Green et al., 2018; Holdsworth and Landais, 2019; Holdsworth et al., 2020; Laar et al., 2019).

The conceptual model (Figure 2.8) that informed the interview guide and direction of this study was useful for interpretation of results. Nearly all the students had some level of body size dissatisfaction that they sought to address through alteration of their food choices. The body dissatisfaction was attributable to three major dimensions:
macro-level forces, micro-level forces shaping their local social and environmental contexts, as well as inherent personal characteristics of the student. For example, the students we spoke to discussed sociocultural tensions they experienced between their families’ expectations of their appearance and eating habits and what they believed was best for them, which was based on what their friends and the media conveyed to them. The foods that they found to be most appealing were foods in their food environment that they believed were healthy, which was conceptualized through aspects of food safety, functional aspects of health, and cultural or habitual practices. These were school-going students residing in an urban area, with many having unsupervised access to multiple platforms of media promotional materials, including television, radio, print, and internet/social media. Studies that were conducted in Burkina Faso and Tanzania did in fact find that as more young people gain media access, they became vulnerable to body dissatisfaction from exposure to unrealistic messages put forth about ideal body sizes (predominantly those considered attractive in Western cultures) and dieting practices (Eddy et al., 2007; Terhoeven et al., 2020). Our study also found similar results, with many adolescents admitting to having body dissatisfaction and changing their diets to attain a figure that emulates models and influencers on social media or famous people on television or on outdoor advertising materials that they had seen. Skipping meals, reducing portion sizes, avoiding specific nutrient groups (e.g., fats), snacking instead of consuming full meals, and other food behaviors were ways in which students we spoke to attempted to alter their body sizes to attain their desired figure. These dieting behaviors, if practiced long term, could result in disordered eating patterns that have the potential to affect long-term health. Future interventions must consider the effects of competing
pressures in an adolescent’s social environments from cultural expectations, household characteristics, school characteristics, and media access alongside the ever-present food environment which they reside in. This conceptual model, adopted from Story and Alton’s 1996 model of adolescent food choice behaviors, accounts for the effects that macro-level forces, including globalization, affect an individual’s access to food and information and can change or distort their personal health and social status aspirations, consistent with the information we obtained in this study. Our study added extra layers to the existing literature about body image and food choice by accounting for the effects of globalization on food systems and media, which in turn influence adolescents’ perspectives about themselves and the world around them, and subsequent decision-making processes around food.

The surge of obesity and diet-related NCDs in LMICs suggests that there is more happening beyond any individual’s ability to make healthy food choices. Blankenship and colleagues (2000) talk of the significance and utility of implementing ‘structural interventions’ in public health to address larger-scale, complex public health problems. Structural interventions work by changing the contexts where health might be produced or reproduced and move away from the individual to focus on the environment in which the individual exists (Blankenship, Bray, & Merson, 2000). To promote healthier dietary behaviors, structural interventions targeted at the food environment are necessary (Monsivais, Thompson, Astbury, & Penney, 2021). In recent years, an interest in the role of food environment in health behaviors and decisions, including food choice, has gained significant traction (Turner et al., 2018). Examples of structural interventions to promote sustainable healthy diets could be increasing access, affordability, and availability to
fresh fruits and vegetables (Brown et al., 2019; Monsivais, Thompson, Astbury, & Penney, 2021). Other food environment interventions have included disincentivizing unhealthy food purchasing through taxation, as well as policies regulating junk food marketing and advertising in and around school zones, at retail outlets, and in mass media (Allcott, Lockwood, & Taubinsky, 2019; Taillie, Busey, Stoltze, & Dillman Carpentier, 2019). While such programs and policies are well-intentioned in their goals to improve nutrition and reduce diet-related NCDs, their success or failure depends significantly on the buy-in of various stakeholders, including and especially, the beneficiaries.

A key characteristic of the global nutrition transition is that portion and package sizes have increased substantially in the last few decades. Public awareness of these portion size increases remains low, and several studies have found that consumers tend to believe that these larger portions are “normal” and “appropriate” quantities to ingest during regular eating occasions, which has implications for obesity and diet-related NCDs (Bryant & Dundes, 2005; Kruskall, 2006; Livingstone & Pourshahidi, 2014; Schwartz & Byrd-Bredbenner, 2006). From this study, we learned that students conceptualized appropriate portion sizes as eating a balanced diet that includes all food groups in a meal, and as eating “anything in moderation.” They could not articulate what foods and beverages should be consumed and in what specific quantities to optimize health. These results suggest that school curricula must go beyond teaching students only about macronutrients and integrate information about portion control, particularly for energy-dense and/or nutrient-poor, processed, and ultra-processed foods) and mindful eating practices. Additionally, Ghana is amid developing evidence-based, culturally-appropriate, food-based dietary guidelines (Aryeetey, 2020). Future health promotion
activities may include the integration of these guidelines into school curricula and dissemination to communities.

Currently, there are no specific policies regarding food sold in and around the school food environment (Ogum Alangea et al., 2020). Act 851 of Ghana’s Public Health Act of 2012 is the key regulatory channel. This law mandates that vendors sell wholesome food to consumers, but there are no specific provisions for nutritional content of foods. Vendors are also required to register if they want to sell their food products and food vendors must obtain a food hygiene certification that involves testing for foodborne disease, among other requirements. Enforcement of Act 851 of the Public Health Act of 2012 is supervised by the various local governing bodies (e.g., metropolitan, municipal, and district assemblies) in Ghana. Currently the individual school headmasters and administrative staff, along with parent-teacher associations, are tasked with regulation of foods sold within the school food environment. As school headmasters are faced with numerous logistical and administrative challenges daily, they generally do not possess the knowledge, time, interest, or experience in creating healthier school food environments for the students who attend their educational institution (Ogum Alangea et al., 2020). As many school food environments are fraught with processed and ultra-processed foods that are aggressively marketed to children and adolescents, opportunities to curtail consumption can be challenging without food and nutrition policies at the national, sub-national, and local levels. One promising policy involves the implementation of front-of-pack labeling of relevant nutritional information, which has been launched in various countries in Latin America and Europe with promising initial results (Croker, Packer, Russell, Stansfield, & Viner, 2020; Feteira-Santos et al., 2020; Song et al., 2021). Since
several of the students we spoke to mentioned that they would read nutrition labels on packaged food when considering what foods to purchase, front-of-pack labeling could potentially enable young people to become more empowered about the food choice decisions that they make, particularly if the labels are easy to understand and apply to their daily life. As the MEALS4NCDs Projects gathers more evidence about food environments for children and adolescents attending public sector basic schools, engagement with policymakers to establish front-of-pack labeling policies could potentially be a tangible and viable option and could also serve a secondary purpose of pressuring food and beverage producers to be more accountable about harmful ingredients in their products by providing more health and nutrition transparency (Laar et al., 2021).

In our discussions with the students about healthy and unhealthy food and eating, all the students were asked to recall the foods they ate on a typical day and the portion sizes that they normally consumed. An overwhelming majority of the foods that students told us they consumed were traditional or local dishes, with some Westernized or non-traditional foods. Due to the ingredients used and cooking preparation methods, however, these traditional or local dishes would still be considered unhealthy. As Ghana continues to advance through the nutrition transition, many traditional spices and ingredients have been replaced by cheaper and more palatable ingredients. For example, traditional West African soups and stews would incorporate dawadawa, the fermented paste of the seeds of the African locust bean tree (*Parkia biglobosa*) as it has a unique flavor and taste profile, as well as a high level of nutritive value. In recent decades, however, dawadawa’s popularity and perceived palatability has significantly diminished
with the introduction of bouillon (stock) cubes (Nestlé’s “Maggi” and similar types of products) for soup and stew preparation. These newer alternatives to dawadawa contain high levels of sodium, saturated fats, and other chemical additives that are known contributors to hypertension and other diet-related NCDs. At this point, however, stock cubes are heavily embedded into Ghanaian foodways, and are ubiquitous in the food environments of the Greater Accra Region (Airhihenbuwa & Iwelunmor, 2012; Ham, 2017). Similarly, the widespread adoption of oils to fry foods, believed to be a more modern cooking method for items that were historically boiled or roasted over fire, has also been implicated in diet-related NCDs. There is a small but growing movement to bring back traditional cuisine and methods of food preparation. A large part of Ghana’s cultural identity and pride is tied in their foodways, which could potentially present opportunities to improve nutrition through food systems levers that include increasing availability and accessibility of traditional ingredients in restaurants and food retail outlets (Ham, 2017). In addition to food systems solutions to increase availability and access to traditional foods and ingredients, health promotion interventions might consider messaging relating to food and the role it plays in the larger narrative about Ghanaian identity. For example, a recent study on Ghanaian migrants to Europe discussed how migration and subsequent acculturation led to major dietary changes. The study recommended future interventions that would de-emphasize consumption of foods and beverages that were both detrimental to health and not actually part of the true Ghanaian cultural identity (Osei-Kwasi et al., 2020).

Source of information about healthy and unhealthy food was a frequent topic of discussion with students. We found that students conceptualized healthy and unhealthy
food and eating across three domains: food safety, functional aspects of health, and cultural habits or practices. These three domains were influenced by the opinions of those in their social networks as well as various sources of food guidance, including media, government agencies, medical professionals, advertising health claims, and school curricula. With respect to food guidance, several students mentioned that they believed that a food was healthy if it was “vetted and approved by the FDA,” a common disclaimer placed upon food and beverage advertisements on television and in the food environment. The Ghana FDA’s mandate is not to evaluate the nutritional value of foods and beverages to promote healthier diets, but rather to ensure that the public receives accurate information about the wholesomeness of foods and control the nature of advertisements in publicly accessed spaces, including television and billboards. The FDA is also tasked with ensuring that advertisements in public spaces do not promote unproven cures or treatments for diseases (Ghana Food and Drugs Authority, n.d.). From our study, we found that students believed advertisements vetted and approved by the FDA were indicators of healthy food, suggesting a high level of confidence in the FDA’s role in guaranteeing the public’s health. Private sector food and beverage producers in the Greater Accra Region have exploited these “vetted and approved” messages to help market their products, particularly those that are processed and ultra-processed, as “healthy” or “safe.” Based on their comments, it was clear to us that the students did not have an accurate understanding of the work of the FDA and various government entities in regulating foods they find in their local food environments. Future directions may consider engagement between communities and the FDA directly to encourage them to tighten up criteria when vetting and approving food and beverage advertisements and
improve the transparency of the vetting and approval process. The FDA should be made aware that children and adolescents do pay attention to and place high credence to the agency’s disclaimers about vetting and approval of product advertisements. Potential revisions to their disclaimers may consider expansions of their vetting and approval statements to include specificity about what they are vetting and approving, as well as the fact that they do not conduct in-depth evaluation of the long-term health effects of consumption of specific foods and beverages.

Various sources of food guidance and health information that students lent credibility to presents opportunities for the Ghana Education Service to enhance their curricula. For example, students referenced what they learned in various health science classes in our discussions about healthy and unhealthy foods and eating. Although they displayed some fundamental academic knowledge about micronutrients and macronutrients, students were unable to apply nutritional information they obtained and found credible from their school to their daily eating episodes, which we noticed from their dietary recalls. Students also had told us that they found information on the internet and social media, television, radio, and other media sources to be more credible, even when it conflicted with what they were told in school. Considering that the students appeared unable to differentiate between deceptive advertising and general misinformation to apply the correct information and knowledge from their coursework into their daily life, an important implication for this issue is that the Ghana Education Service may consider future interventions and programs that would seek to improve media literacy as a major step to improving the health of youth in the country. As adolescents in LMICs become more and more connected through technology, it is
important that they can identify and differentiate between legitimate content and content
designed to glamorize or normalize unhealthy behaviors and dismiss risky behaviors
(Brown, 2006). There is a growing body of literature on media use among adolescents
that suggests that media can serve as a “super-peer” for people of this age group and
plays a significant role in how they see themselves and their worldview, including which
behaviors to engage in and which to avoid (Brown, Halpern, and L’Engle, 2005). From
our study we learned that these school-going adolescents are quite susceptible to
aggressive marketing tactics used by food and beverage companies, including the use of
celebrities and influential figures who draw attention to body size aspirations and other
sociocultural values important to the teenage population. The Ghana Education Service
may consider incorporation of media literacy education alongside health education and
body positivity education into basic and junior high school curricula, which would help
children and adolescents become more informed consumers that can handle challenges
associated with body image dissatisfaction, pressures to consume certain foods and
beverages, and recognize when and how they are being manipulated by the food and
beverage companies and mass media.

Students talked about how their consumed portion sizes differed when eating
around people they knew such as their families and friends compared to eating around
strangers. This finding pointed to gendered differences in food choice among adolescents.
It was mostly female students who told us that they were uncomfortable with others
watching them eat and feared that they would appear “gluttonous” or not “ladyish” if they
consumed larger portion sizes. The female students we spoke to discussed the personal
and social pressures they felt to achieve and maintain a certain figure through the food
choices that they made, These findings are in accordance with prior studies that looked at food choice as an integral part of identity, including the notion of “masculine” and “feminine” foods even among small children (Bisogni et al., 2002; Cooke & Wardle, 2005; Wardle et al., 2004).

Students reported having frequent disputes with their elders about how much and what types of food to consume. Their elders wanted them to eat more and have a larger body size while their peers and the media, including internet and social media, would offer conflicting messages more congruent with Western body size ideals. These tensions have implications for eating disorders as more and more Western body size ideals infiltrate LMICs and access to various forms of media become more ubiquitous. There have been multiple studies in Western countries suggesting that social media exposure has a negative effect on body image and dieting behaviors, including development of eating disorders, among adolescents (Lucibello et al., 2021; Rounsefell et al., 2020; Santarossa & Woodruff, 2017). Studies in Tanzania and Burkina Faso found that body dissatisfaction and eating disorders are slowly developing among young females who were frequently exposed to media messages about body image on magazines, radio, internet, and television (Eddy et al., 2007; Terhoeven et al., 2020). While we did not examine the effect of social media exposure on body image and food choice in this study, most students we spoke to in this study reported having some access to and being influenced by Instagram, Facebook, TikTok, and other platforms that inadvertently promote Western concepts about ideal body size and fad diets. Future research in LMICs must explore the effects of social media exposure on adolescent food choice and body image perceptions.
We interviewed students of variable observed body sizes. On average, students identified the healthiest body sizes as a bit heavier (body silhouette seven) than what they believed to be most attractive (body silhouette four for boys, five for girls) and what they aspired to look like (which was on average, the same as what they believed to be most attractive, four for boys and five for girls). The developers of the body size silhouettes classified body sizes one to five as underweight, six through nine as normal weight, ten through thirteen as overweight, and fourteen to eighteen as obese (Ettarh et al., 2013). The students recognized that a healthy body weight would be around size seven but aspired to and believed body size four (boys) or five (girls) to be most attractive. This cognitive dissonance is an important finding and has implications for healthy eating messaging by public health campaigns. Specifically, adolescent student food choices were not driven by a desire to appear healthy, but rather by a desire to appear attractive.

From our study, we found that there were three main reasons driving the students’ desire to maintain a specific body size or shape: to attract romantic partners, to avoid physical limitations, and to prevent being the target of social stigma about body size. As a result, they would alter the quantity and quality of food that they eat to achieve or maintain the specific body size that they believed to be most attractive, regardless of the health value. Efforts to encourage children and adolescents to keep a normal weight or healthy body size should consider students’ intrinsic motivation for their body size aspirations.

Students in this age group were clearly not driven by long-term health consequences of being underweight or overweight; rather they were driven by what could affect their life in the present, including the image they project to others. Thus, messaging and campaigns should factor those sentiments into their intervention design.
Interventions might consider using the four main principles of commercial marketing (product, price, place, and promotion) to create social marketing campaigns around making healthier food choices to attain the desired body size as well as promotion of body positivity to mitigate risks of eating disorders. In social marketing, the first P, product, is the desired behavior by the specific audience or beneficiaries, often intangible. The second P, price, is conceptualized in social marketing as weighing the risks and benefits to a consumer that the product might bring. The third P, place, is defined as the venue where the beneficiaries might access the service or program and must be accessible to them with minimal barriers to entry. The final P, promotion, encompasses the methods and activities by which the target audience can be reached and includes the other three aspects (product, price, and place) (Grunert, 2006; Wong et al., 2004).

One particularly successful social marketing campaign that utilized the four Ps to achieve desired outcomes was the VERB™ initiative, an American media campaign implemented from 2002-06, designed to increase physical activity among younger adolescents (“tweens”) aged 9-13 years old (Wong et al., 2004). VERB’s key messages were centered around the idea that the campaign would be “for tweens, by tweens,” and encouraged physical activity as an actual lifestyle by “trying new verbs.” The campaign included various components of paid advertising nationwide that ran on various media platforms, including television, print, and online messaging, which allowed it to have an expansive reach (Wong et al., 2004). Similarly, for encouraging adolescents to make healthier food choices, messages in a social marketing campaign could consider using the four Ps to nudge adolescent consumers toward choosing healthier diets as a way of life to look the way that they want to look like. Additionally, because celebrities (e.g., athletes,
actors, and musicians) and other influential individuals (e.g., politicians, government officials) significantly influence adolescents’ views of themselves and each other and subsequent health behaviors, a healthy eating social marketing campaign could consider the potential of enlisting celebrities and various influential figures to legitimize messages (Abroms & Maibach, 2008; Da Silva & Mazzon, 2016; Doustmohammadian & Bazhan, 2021; Schmidtke, Kubacki, & Rundle-Thiele, 2021).

An important driver of food choice expressed by students was food safety, which formed a significant part of their perspectives on healthy and unhealthy food and eating practices. We asked the students about their impressions of the food environments in and around their schools, and all students talked about the hygiene and sanitation of the vendor and foods that were sold. Many students defined “healthiness” in terms of the product being free of microbial contamination, adulteration, or the use of pesticides and other agrochemicals. This may potentially be explained by the fact that in Ghana and other LMICs, the nutrition transition and prevalence of obesity and diet-related NCDs is still a relatively novel issue for the public. As larger body sizes are culturally favored in Africa, the perceived threat of obesity and diet-related NCDs is generally lower (Bosire et al., 2020; Cohen et al., 2013; Okop et al., 2016). In contrast, the effects of unsafe food have been an issue for a very long time, with more easily recognizable and acute symptoms (e.g., diarrhea, vomiting) and are often a leading cause of mortality for children under five, elderly, and immune compromised individuals (Adam, Hiamey, & Afenyo, 2014; Black et al., 2013; Grace, 2015; Omari & Frempong, 2016; Rheinländer et al., 2008; World Health Organization, 2015). Food safety concerns have implications for health and nutrition as there are widespread opinions that packaged foods, particularly
those that are processed or ultra-processed, are sealed and have gone through the manufacturing process, rendering them free of contamination or pathogens and “healthier” than fresh foods (Grace, 2015; Omari & Frempong, 2016; Ragasa et al., 2019; Speed et al., 2017).

The concerns and interest in food safety and functional aspects of health highlighted by the students in this study could potentially be leveraged to promote healthier food choices through countermarketing strategies. These strategies have been used most recently and successfully in smoking cessation campaigns and include tactics such as revealing the ulterior motives of corporate entities, including their use of deceptive marketing and sneaky or underhanded practices (Freudenberg, Palmedo, Murphy, & Garza, 2016). In recent decades, countries like Ghana that are undergoing rapid food environment changes have also observed an influx of multinational food and beverage company investment (Baker & Friel, 2016; Jacobs & Richtel, 2017; Stuckler, McKee, Ebrahim, & Basu, 2012). Fast food restaurant entities such as Yum! Brands (parent company of Kentucky Fried Chicken® and Pizza Hut®), Burger King®, and others have built a strong presence, particularly in the Greater Accra Region (Searcey & Richtel, 2017). Additionally, companies such as Nestlé®, Coca-Cola®, Mondelez International®, as well as local food producers like Fan Milk International® and Nutrifoods Ghana Limited®, have penetrated supermarkets and other retail outlets within food environments with Western-style processed foods (Baker & Friel, 2016; Bragg, Hardoby, et al., 2017; Kroll et al., 2019; Oltmans, 2013). Most of these products are advertised on television, outdoors (e.g., billboards), print, and internet and often contain various claims about the healthiness of their products, such as fortification of vitamins.
and minerals. In our study, several of the students mentioned products that they consumed and their rationale for consuming, which included “health reasons.” For example, one student talked about how they believed that a FanMilk® ice cream bar was “healthy” because it “contained fruit” and “vitamins and minerals.” This same student did not even consider the reality that the level of added sugars, artificial flavors, and other chemical additives in a FanMilk® ice cream bar effectively negates the nutritional value of the product’s fortification of vitamins and minerals. Many other students expressed similar sentiments; specifically, a widespread trust in the product’s health claims and faith in the individuals, particularly celebrities, who promote the food items. Most also admitted that they were easily swayed to purchase processed foods and fast foods by the methods used by the food and beverage retailers, including health claims on packaging. This issue is further compounded by the simple fact that adolescents are in a transition period between childhood and adulthood and are learning how to be more independent in various aspects of their lives, including food choice decision-making (Bassett et al., 2008; Sturdevant & Spear, 2002). It is common knowledge that adolescents worldwide are known to engage in risky behaviors, including making unhealthy food choices, for various values and considerations that reflect their stage of emotional and cognitive development (Bryan et al., 2016). Such reasons include improvement or maintenance of social status, peer pressure, rebellion against authority, taste preferences, and cost. These reasons have a strong effect on what adolescents believe are acceptable and desirable foods to consume (Brown et al., 2015; Contento et al., 2006; Fitzgerald et al., 2010; Maulida et al., 2016; Rathi et al., 2016; Stevenson et al., 2007; Story, Neumark-Sztainer, & French, 2002; Verstraeten et al., 2014; Ziegler et al., 2021). There are opportunities to
use countermarketing to leverage such adolescent values for promotion of positive food choice behaviors. For example, an innovative intervention study conducted in Texas and led by researchers at the University of Chicago aimed to educate adolescent students about manipulative and deceptive marketing techniques used by food and beverage companies targeting their age group, using an investigative journalism approach to deliver information on how junk food is deliberately made to be more addictive and contains false claims about the nutritional value, and that the attractive people promoting the products do not engage with the products in real life. The researchers also showed the students pictures of food industry executives who were described as “controlling and hypocritical adults,” which triggered the students’ values of autonomy and justice. These students increasingly felt like they were being manipulated and deceived by the food companies and that making healthier choices was an act of rebellion (Bryan et al., 2019, 2016). By catering to adolescent psychosocial development values and milestones, this novel intervention has shown very promising preliminary results.

The information we gathered from urban Ghanaian adolescents about perspectives on healthy and unhealthy foods and eating, as well as the value they place in various sources of information (e.g., their social networks and food guidance), can potentially be used to develop countermarketing campaigns to discourage unhealthy food choices. For example, several students expressed widespread fears about chemical adulteration in food, including the use of artificial colors and flavors in packaged foods, such as ice cream or biscuits. Targeted messages can be developed and disseminated to encourage consumption of unprocessed, healthier foods that do not contain artificial colors and flavors, such as fruits and nuts. For students who are solely concerned about food safety
and food adulteration, messaging can talk about how added sugars, salt, and saturated fats are frequently added to common foods to make them more palatable and increase their shelf life, which are forms of food adulteration. For students who are concerned about both food safety and functional aspects of health as they relate to athletic or academic performance or body image, messaging can center around how unhealthy packaged and processed or ultra-processed foods are not generally consumed by those who endorse the products, and that the artificial colors and flavors will reduce their performance and hinder their ability to obtain the figure they desire. Messaging around exposing the various health hazards of chemical additives, including artificial colors and flavors in commonly consumed ultra-processed foods can serve to help school-age children and adolescents become more informed and conscientious consumers that are willing and able to reconsider the diets they currently consume.

We spoke to several school and class prefects for our interviews. These are students who serve as liaisons between the school officials and the student body and are expected to hold a leadership role among the student body. School prefects could potentially serve as advocates for healthy eating and agents of behavior change. A prior intervention in Nigeria sought to improve school-based sanitation and hygiene through the enlisting of school “sanitation and water prefects” who role modeled healthy and hygienic behaviors, including cleaning of classrooms, bathrooms, and maintenance of hand washing facilities, as well as weekly discussions and sharing of stories about sanitation and the school environment with students. This program was successful in improving the hygiene and sanitation of the school because of the use of prefects, who were elected by the student body. The role was for a limited time and students eager to
become the next elected prefect would consistently demonstrate proper sanitation and hygiene publicly to get noticed and in turn, engage other students. The intervention led to an aggregate improvement in sanitation and hygiene in the school (Olayiwole & Okoro, 2003). A similar model can potentially be explored to promote better diets, where “health prefects” could be elected by the student body and can work with the school officials to disseminate and role model healthy food behaviors. These prefects could also receive extra training and instruction by school staff to help engage in counter marketing of unhealthy foods and beverages (Freudenberg, Palmedo, Murphy, & Garza, 2016).

Considering the general ineffectiveness of current nutrition education programs for adolescents, future policies programs in Ghana and other LMICs must be innovative and based on evidence gathered to address the ever-growing problem of obesity and NCDs among children and adolescents who are perpetually exposed to unhealthy food environments. Moving forward, the findings and insights from this study suggest that it would be beneficial and necessary to deploy not a single intervention or policy, but rather, a combination of various individual-level, community-level, and structural or food environment-level programs and policies over a longer period that would likely have more of an impact than any one individual program or policy. With adolescents, knowledge, attitudes, and behaviors are still rather malleable and prior studies have shown that lifelong healthy habits can be instilled at this critical life course time point. Thus, this is an important population group to work with to make lasting change in health in Ghana as well as other countries that are in various stages of the nutrition transition and facing multiple burdens of malnutrition and NCDs. Food choices are not made in a vacuum; the students in this study frequently alluded to the influence of those within their
social networks as well as various sources of food guidance that they consider when they make decisions about what they want to eat given the numerous constraints that they face on a regular basis. We learned that these adolescents have some level of body image dissatisfaction and alter their food choices to try to alter their body sizes, which, if left unaddressed, can potentially lead to an uptick in eating disorders and mental health among this population group in this context. Our work suggests that it is crucial that interventions, policies, and programs to promote healthy and sustainable diets must communicate through the channels that the target audience trusts and speak in the language that the target audience can understand.
REFERENCES


Google Maps. (2020). Maps - Ghana. Retrieved January 4, 2020, from [https://www.google.com/maps/place/Ghana/@7.8984803,-5.5156405,6z/data=!4m5!3m4!1s0xfd75acda8dad6c7:0x54d7f230d093d236!8m2!3d7.946527!4d-1.023194](https://www.google.com/maps/place/Ghana/@7.8984803,-5.5156405,6z/data=!4m5!3m4!1s0xfd75acda8dad6c7:0x54d7f230d093d236!8m2!3d7.946527!4d-1.023194).


APPENDIX A

INTERVIEW GUIDE

AIM 1:

1. Please tell me who you stay with (who is in your household?).
2. Walk me through your typical day of eating (INTERVIEWER SPECIFY TO STUDENT THAT WE ARE ASKING ABOUT THIS AS IT PERTAINS TO PRE-COVID TIMES!)

Table 1

<table>
<thead>
<tr>
<th>Place/Situation</th>
<th>Food/Drink #1</th>
<th>Food/Drink #2</th>
<th>Food/Drink #3</th>
<th>Comments from interviewer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (specify venue or situation, social or community context - interviewer to probe):</td>
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<td>____________________</td>
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</tr>
</tbody>
</table>
3. **Interviewer to pick 3 food/drink items at random from above table. One by one, ask:**

Thinking about X [food or drink item], please use the play dough (and/or portion size estimation aids from Australian Food Model Booklet) and these images (show portion size estimation aids AFTER student puts play dough on dishes), please tell me how big your portion sizes would be.

**Table 2**

<table>
<thead>
<tr>
<th>Food/drink item</th>
<th>Venue where item is consumed (from above table)</th>
<th>Portion size ID (e.g., MD, B, G, etc)</th>
<th>Portion size amount (e.g., A-D)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

4. **Interviewer to refer to the 3 items in Table 2 and ask the following:**
   a. When might you eat [or drink] MORE of X [food or drink item]?  
      i. [Only if student is struggling to answer when, probe: are there certain days or times where you might eat or drink MORE of X [food or drink item]? Maybe an event or holiday where you might eat or drink MORE of this?]

   b. IMPORTANT: Why do you choose to eat MORE at that particular time [state example given]?
c. With same food item, ask: when are times when you might eat [drink] LESS of X [food or drink item] at home?
   
i. [Only if student is struggling to answer when, probe: are there certain days or times where you might eat or drink LESS of X [food or drink item]? Maybe an event or holiday where you might eat or drink LESS of this?]

   d. IMPORTANT: Why would you eat LESS at that particular time [state example given]?  

5. Do you take snacks in between meals?
   a. What snacks do you take?
   b. Why do you take snacks?

6. So now I want to ask you about your own food purchasing, whether it is at a shop, market, chop bar, or restaurant. Show portion size estimation aids if needed.
   
a. When you buy different kinds of foods or drinks, does the size of the package you see help you decide if you want to buy it?
      i. Probe: WHY?

   b. Probe: Does the size of the package you see help you decide how much of the food you want to eat at one time? (if student does not understand, ask if they eat some right after buying and keep some later, or if they eat all at once, or eat some and share the rest,….)
      i. Probe: WHY?

   c. How do you get money to buy food/drink?
      i. How much money do your ___(whomever student lives with – adults in household)__ give you each day?
      ii. What do you spend your money on?
      iii. How much of that money do you spend on food/drink?

7. If you do not want to eat the food that is already prepared at home, what do you do?
   a. Probe: Do you eat something else? If yes, what?
   b. Probe: (if student says they go and buy something else) ask them what they buy instead of what is prepared in their home.
AIM 2:

8. Now I want to talk to you about something a little different. [show student body silhouettes on separate pages without the numbers that correspond to their sex].

i. Which of these figures do you think shows a HEALTHY girl (or boy)?
   a. **IMPORTANT:** Why do you think that?
   b. **Probe:** What is it about this figure makes them appear healthy in your opinion?

ii. Which figure do you think shows the MOST ATTRACTIVE (hot, beautiful, handsome, etc). girl (or boy)?
   c. **IMPORTANT:** Why do you think that?
   d. **Probe:** What is it about this figure makes them appear attractive (hot, beautiful, handsome, etc.) in your opinion?

9. Please look at these drawings of girls (or boys), and tell me which figure most closely resembles YOU?

10. If you could pick an alternative body shape/size for yourself, which one of these figures would you pick?
   a. **IMPORTANT:** Why did you pick that?

11. Which one of these figures would YOUR FRIENDS OR KIDS AT SCHOOL say that a girl (or boy) your age should look like?
   a. **IMPORTANT:** What kinds of things do your friends think are really beautiful or hot (or attractive, good looking, etc.)?

12. Which one of these figures would ___(whomever student lives with – adults in household)___ say that a girl (or boy) your age should look like?
   a. **IMPORTANT:** What kinds of things ___(whomever student lives with – adults in household)___ think are really beautiful or hot (or handsome or attractive)?

13. Do you agree with what other people such as your friends or (whomever they stay with) or kids at school say about attractive body shapes/size?
   a. If yes, why do you agree with them?
   b. If no, why do you disagree with them?
14. Ask about body silhouette extremes:
   a. What do you think about the body size and shape of figure 1?
      i. Do you know anybody who looks like figure 1?
         1. Have you seen them eat?
         2. What do they eat?
         3. What do you believe to be the cause of someone having a body size/shape like figure 1?
   b. What do you think about the body size and shape of figure 18?
      i. Do you know anybody who looks like figure 18?
         1. Have you seen them eat?
         2. What do they eat?
         3. What do you believe to be the cause of someone having a body size/shape like figure 18?

15. Now, please tell me about a person that you admire because they are attractive [hot, good-looking, handsome, beautiful] in your opinion. They can be someone you know personally or someone famous like an actor or sports person.
   a. Who have you selected?
   b. We don’t know who (person who participant says is attractive) is. Could you please describe them to us?
   c. What things do you think they may have done to themselves to get to be attractive (hot, good-looking, handsome, or beautiful)?
      i. If participant is confused, suggest something about what foods they might be eating, or sports they might play, and then ask participant to explain.

16. Do you or other kids your age ever change what you (or they) eat in order to try to look like someone whose body you (or they) admire?
   a. If yes, what changes do you (or they) make?
   b. If no, why do you think that?

17. Interviewer to show body silhouettes to participant.
   a. You said you wanted to have a body like figure X. What types of foods or drinks could you have that would help you get to (or stay at) the figure you would like to have?

18. What do you believe could be the connection between the amount of food you eat (portion sizes) and how your body appears?
   a. Probe: Does the amount of food you eat affect the size your body becomes?
   b. Probe: How?
c. Do you ever increase or reduce the amount of food/drink you take in order to change your body size?
   i. What foods?
   ii. Why?

19. Interviewer: Now I would like you to look at some food and drink advertisements from Ghana. Interviewer to pick a food advert at random and ask participant what is the key message that the photo is trying to tell them.
   a. Is the product healthy or unhealthy?
   b. Is this food that you would WANT to eat [drink] A LOT of?
      i. Why would you want to eat [drink] A LOT of this?
   c. Is this food that you SHOULD eat [drink] A LOT of?
      i. Why should you eat [drink] A LOT of this?

20. Interviewer to repeat this exercise one more time - pick a food advert at random and ask participant what is the key message that the photo is trying to tell them.
   a. Is the product healthy or unhealthy?
   b. Is this food that you would WANT to eat [drink] A LOT of?
      i. Why would you want to eat [drink] A LOT of this?
   c. Is this food that you SHOULD eat [drink] A LOT of?
      i. Why should you eat [drink] A LOT of this?

21. Interviewer to lay out all adverts for participant to view
   a. Is there anything you notice about the body sizes of all the people in these adverts?
      i. Do any of them look like how a girl or boy (or students) your age should look like?
         1. Probe: (only if participant says yes) – which ones look like how a girl or boy (or students) your age should look like?
         1. Probe: Why?
   b. Is there anything you notice about the types of food they are promoting in these adverts?

22. Do you or anyone you know compare yourself or themselves to the bodies of the people seen in food and drink adverts?
   a. If yes, what are some ways that you or people you know compare themselves to people seen in food and drink advertisements?
b. How do you feel about yourself or think others feel about themselves when they compare their bodies to the people in the advertisements?

2. Please tell me about some places where you see adverts for food or drinks?
   a. Probe if needed: Do you have a mobile phone with internet? On tv? Outside?
   b. Can you give some examples of adverts you have seen?

3. What is your opinion of the food environment around your school?
   a. What do they sell?
   b. Is it healthy or unhealthy?

4. Do you believe you have a healthy diet?
   a. Why or why not?

5. We have asked you a lot of questions here. Is there anything that you think we should have asked you about today related to your food choices, bodies, eating habits, or anything else that you think we should know that we have not talked about yet?

Thank you so much for your time and thoughtful answers! Stop recorder and give participant incentive.
APPENDIX B

STUDY INFORMATION SHEET

**STUDY TITLE:** Drivers of Adolescent Food Choice Amidst the Nutrition Transition in Urban Ghana

**Introduction**

Good morning/afternoon. I am [Name of Research Assistant], assisting Dr. Amos Laar of the School of Public Health, University of Ghana, and team to conduct a research study. The discussion we are having is going to inform you on what we are about to do and let you decide if you want to be part. The research study is titled: “Drivers of Adolescent Food Choice Amidst the Nutrition Transition in Urban Ghana”. It is a smaller study that is a part of the “Measuring the healthiness of Ghanaian children’s food environments to prevent obesity and Non-Communicable Diseases” which you may have already been participating in.

A research study is a way to learn more about people/situation in other to understanding it better. There may be some words that you may not understand during this discussion that you will want me to explain more. Please feel free to ask me to stop at any time and I will take time to go over again and explain anything you don’t understand.

**Purpose and nature of the research**

This research is being done to learn more about the food environment in your school and its surroundings. In our interview, we will talk about your understanding of healthy/unhealthy foods, what influences your food choices, what you think about different body types and sizes, foods/drinks advertisements in and around your school area and also how they might influence what you eat and how much you might eat. What we will find after this interview will help us to find ways that could make children and adolescents like you eat and drink healthier foods. I will use an audio recorder to record our voice when we are talking.
Once I take part, can I change my mind?
We will be glad if you agree to participate in this research even though you can choose not to. If you decide to stop even after we begin, that is okay. We have spoken to your teachers about this research to ask for their permission to allow us to engage you in this interview which they agreed. Even though your teachers have agreed for your participation, you can also choose not to take part in this interview. Also, you can choose to end your participation at any time during the interview. Such a decision to withdraw from the study will have no penalty for you.

How long will it take?
This interview will take about 45-60 minutes.

Are there any risks if I take part in the research?
We do not see/think any problems will happen if you agree to take part in this research.

Benefits
You will not receive any direct benefits for your time spent on this research, but you may find that talking to us about your food choices may help you and those in your community or ward to think more about what foods and drinks are consumed and why they are consumed. We also believe that if you agree to take part, you will help us find ways that could make children and adolescents in Ghana have access to healthier food/drinks.

Confidentiality
We will keep all your answers or anything you say private. This means that we will not share anything you tell us with anyone (your classmates, friends, families, or teachers) apart from the team working on the research. All the research documents will be stored in a locked cabinet at the office of the leader of this research study at University of Ghana and will be used only by the research team. Any report we write will not include your name or that you were in the research.

Compensation
You will receive either a t-shirt, exercise book, or face mask as a token of our appreciation for your participation in this interview. We thank you for your time to help us find ways that could make children and adolescents in Ghana eat/drink healthier foods.

Provision of Information and Assent for participants
A copy of this Information sheet and Assent form will be provided to you after it has been signed or thumb-printed.
Contacts for Additional Information

If you think of a question later, or do not like anything about the project you or your parents can please contact:

**Leader of this project:** Dr. Amos Laar (School of Public Health, Box LG 13 University of Ghana. Email: alaar@ug.edu.gh . Telephone: 024 498 2176)

**Student Investigator:** Ms. Krystal Rampalli (Ph.D. Candidate, University of South Carolina, Arnold School of Public Health. Email: rampalli@email.sc.edu . Telephone: 059 337 2643).

**Institute of Statistical, Social, and Economic Research (ISSER):** This research has been reviewed and approved by the Ethics Committee for the Humanities (ECH) of ISSER. You can contact the ISSER-ECH Office between the hours of 8am-5pm through the mobile number: 030 393 3866 or email address: ech@ug.edu.gh.
APPENDIX C

ADULT CONSENT FORM – IDI PARTICIPANT

STUDY TITLE (TENTATIVE): DRIVERS OF ADOLESCENT FOOD CHOICE AMIDST THE NUTRITION TRANSITION IN URBAN GHANA

ADULT (PARENT, HEADMASTER/HEAD TEACHER) STATEMENT

I acknowledge that I have read or had the purpose and contents of the Participant Information Sheet read to me and all questions have been satisfactorily explained to me in a language I understand (English, Twi, Ewe, Ga). I fully understand the contents and any potential implications as well as my right to change my mind. (i.e. withdraw from the research) even after I have signed this form. I voluntarily agree for my child to be part of this research.

Name or Initials of Parent/Guardian/Headmaster/Head teacher: ...................................................

__________________________

Date

Signature or thumbprint of Parent/Guardian/Headmaster/Head teacher

INTERPRETERS STATEMENT

I interpreted the purpose and contents of the participants’ information sheet to the aforenamed participant to the best of my ability in the (English, Twi, Ewe, Ga) language to his/her proper understanding. All questions, appropriate clarifications sort by the participant and answers were also duly interpreted to his/her satisfaction.

Name of Interpreter: ..................................................................................................................

__________________________

Date

Signature or thumbprint of Interpreter
STATEMENT OF WITNESS

I was present when the purpose and content of the participant information sheet was read and explained satisfactorily to the participant in the language he/she understood (English, Twi, Ewe, Ga). I confirm that he/she was given the opportunity to ask questions/seek clarification and same were duly answered to his/her satisfaction before voluntarily agreeing to be part of the research.

Name or Initials of Witness: ………………………………………………………………………………………………………………………………………

___________________________

Date ____________________________

Signature or thumbprint of Witness

INVESTIGATOR STATEMENT

I certify that the participant has been given ample time to read and learn about the study. All questions and clarifications raised by the participant have been addressed.

Name of Researcher: ………………………………………………………………………………………………………………………………………

___________________________

Date ____________________________

Signature of Researcher
APPENDIX D

ASSENT FORM – IDI PARTICIPANT

STUDY TITLE: DRIVERS OF ADOLESCENT FOOD CHOICE AMIDST THE NUTRITION TRANSITION IN URBAN GHANA

PARTICIPANT STATEMENT

I acknowledge that I have read or had the purpose and contents of the Participant Information Sheet read to me and all questions have been satisfactorily explained to me in a language I understand (English, Twi, Ewe, Ga). I fully understand the purpose of the study and any potential implications as well as my right to change my mind. (i.e. withdraw from the research) even after I have signed this form. I voluntarily agree to be part of this research.

Name or Initials of participant: ........................................................................................................................................

_________________________ __________________________

Date Signature or thumbprint of Participant

INTERPRETERS STATEMENT

I interpreted the purpose and contents of the participants’ information sheet to the aforenamed participant to the best of my ability in the (English, Twi, Ewe, Ga) language to his/her proper understanding. All questions, appropriate clarifications sort by the participant and answers were also duly interpreted to his/her satisfaction.

Name of Interpreter: ........................................................................................................................................

_________________________ __________________________

Date Signature or thumbprint of Interpreter
STATEMENT OF WITNESS

I was present when the purpose and content of the participant information sheet was read and explained satisfactorily to the participant in the language he/she understood (English, Twi, Ewe, Ga). I confirm that he/she was given the opportunity to ask questions/seek clarification and same were duly answered to his/her satisfaction before voluntarily agreeing to be part of the research.

Name or Initials of Witness: ……………………………………………………………………………………………………………………………

Date ___________________________________________ Signature or thumbprint of Witness

INVESTIGATOR STATEMENT

I certify that the participant has been given ample time to read and learn about the study. All questions and clarifications raised by the participant have been addressed.

Name of Researcher: ……………………………………………………………………………………………………………………………

Date ___________________________________________ Signature of Researcher
APPENDIX E

ADVERTISEMENTS SHOWN TO STUDENTS DURING INTERVIEWS

Figure E.1. Indomie ® Instant Noodle Print Advertisement #1
Figure E.2. Indomie ® Instant Noodle Print Advertisement #2

It can be true that you haven’t watched a single episode of *Game of Thrones* but it can’t be true that you haven’t tasted Indomie ever!
Figure E.3. FanMilk FanYogo® Frozen Yogurt Print Advertisement #1
Figure E.4. FanMilk FanYogo® Frozen Yogurt Print Advertisement #2
Figure E.5. Royal Perk! ® Shortcake Biscuits Print Advertisement #1
Figure E.6. Royal Perk! ® Shortcake Biscuits Print Advertisement #2
Figure E.7. Bel Beverages Bel-Aqua® Formulated Sports Water Print Advertisement
Figure E.8. Koko ® Coconut Milk Print Advertisement #1
Figure E.9. Koko ® Coconut Milk Print Advertisement #2