Perception of a healthy diet and dietary habits among adolescents in Addis Ababa, Ethiopia

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Abstract

Background: A healthy diet is critical for appropriate child and adolescent health and development as well as for preventing the development of diseases, particularly non-communicable diseases. In low- and middle-income countries, there is an increasing challenge of a double burden of malnutrition. In Ethiopia adolescent undernutrition remains a significant public health problem. While the prevalence of overweight and obesity among children and adolescents is not yet excessively high but is an emerging nutrition-related problem.

Objective: To explore the perception of a healthy diet and dietary habits among adolescents in Addis Ababa, Ethiopia.

Method and target group: The study has a qualitative research design. It was conducted in two governmental and two private schools located in Addis Ababa, Ethiopia. It involved 12 focus group discussions with a total of 51 participants, comprising 38 students and 13 teachers. The focus group interviews were transcribed using F4 transcript, and thematic analysis was used as a method of analysis. The factors affecting adolescents' dietary habits were categorized based on the Socioecological Model.

Result: Adolescents perceived a healthy diet as a balanced diet, with fruits, vegetables, and homemade foods being considered examples of healthy foods. Factors affecting adolescents' dietary habits include self-image, disease, nutritional knowledge, time constraints, and personal preferences at the individual level. At the interpersonal level, family, friends, healthcare professionals, and individuals who are fit or obese were identified. At the organizational level, factors such as availability, accessibility, food safety, advertisements, and educational systems were mentioned. At the community level, community attitudes were stated, as well as a lack of birth limits. At the macro level, the increased cost of living, changes in food production methods, and political instability were identified.

Conclusion: To promote healthy dietary choices among adolescents, it is important to raise awareness by integrating nutrition into the education curriculum, implementing school feeding programs, and establishing rules and regulations on dietary advertising and marketing to create a healthy school food environment.

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List of abbreviations

CDC - Center for Disease Control and Prevention

CSA - Central Statistical Agency

BMI - Body Mass Index

DGA - Dietary Guidelines for Americans

EDHS - Ethiopian Demographic Health Survey

EGSCLE - Ethiopian General School Leaving Certificate Examination

EFBDG - Ethiopian Food Based Dietary Guideline

ENN - Emergency Nutrition Network

FAO - Food and Agriculture Organization

FDRE - Federal Democratic Republic of Ethiopia

FG - Focus Group

GBD - Global Burden of Disease

GHO - The Global Health Observatory

GS - Government School

HDI - Human Development Index

HIV – Human Immunodeficiency Virus

LMICs - Low- and Middle-Income Countries

MOH - Ministry of Health

NCD - Non-Communicable Diseases

NCD-RisC - Non-Communicable Disease Risk Factor Collaboration

PMNCH - Partnership for Maternal, Newborn and Child Health

PS - Private School

SCT - Social Cognitive Theory

SDGs - Sustainable Development Goals

SFP - School Feeding Program

SEM - Socio Ecological model

SES - Socio Economic status

UN - United Nations

UNDP - United Nations Development Program

UNFPA – United Nations Population Fund

UNICEF - United Nations Children’s Emergency Fund

WHO - World Health Organization

1. Introduction

Globalization and trade policies are deeply transforming societies, shaping political institutions, economic and social relationships, modes of food production, food consumption patterns and lifestyles (Cuevas García-Dorado et al., 2019; Fanzo & Davis, 2021). These structural factors have been identified as potentially important drivers of rapid changes in diets (Walls et al., 2018), which are increasingly linked to malnutrition in all its forms. Persistent undernutrition and micronutrient deficiencies continue to coexist with a rising prevalence of obesity and associated non communicable diseases (Blouin et al., 2009). Awareness and capability to make healthy dietary choices are essential to maintain good health and wellbeing in a world where globalization, economic development, technological advancement and shifts in agricultural systems have been rapidly transforming diets across the world in recent decades (NCD Risk Factor Collaboration [NCD-RisC], 2017; Grosso et al., 2020).

Over the last 50 years, dietary patterns around the world have changed dramatically (Wighton, 2020). Starting in developed countries, a pattern of westernization of diet has emerged, with traditional, largely plant-based diets being replaced by diets high in animal products, fats and oils, highly processed foods, added sugar and salt, accompanied by a shift towards more sedentary work and leisure patterns. This phenomenon is called the nutrition transition (Popkin et al., 2012; Fanzo & Davis, 2021; Cyr-Scully et al., 2022). The transition in nutrition is a global phenomenon that alters food systems and has an impact on public health and the environment (GBD Risk Factors Collaborators, 2016). The prevailing patterns of the nutrition transition deviate from the objectives of attaining Sustainable Development Goals (SDGs) related to food security, public health, and environmental sustainability which might lead to the transgression of multiple planetary boundaries (Bodirsky et al., 2020).

The nutrition transition reflects geographic and economic differentials in access to food (Gouel & Guimbard, 2019; Vilar-Compte et al., 2021). Urban diets are higher in fat, sugar, salt, meat, and dairy products and lower in fiber compared with the rural diets (Cyr-Scully et al., 2022). Lower income in urban settings is one factor which contributes to the shift towards fast foods and away from fresh fruits and vegetables, pulses, potatoes, other roots, and tubers (Vilar-Compte et al., 2021). The shift is also from a diet rich in minerals and vitamins to foods which

contain high amounts of energy and cholesterol (Stamoulis et al., 2004). Unhealthy dietary behaviors have been associated with many nutrition-related health problems, and unfortunately, more adolescents are engaging in these behaviors which are often reinforced by the food and beverage industry (Scott et al., 2019).

Adolescents, as defined by the World Health Organization [WHO] (2022) are individuals aged 10 to 19 years, account for 16% of the world population (United Nations Children Fund [UNICEF], 2022). This stage of human development is unique and plays a vital role in establishing good health (World Health Organization [WHO], 2022). Adolescence is characterized by rapid changes in physical growth, cognitive abilities, and emotional development. Many adolescents live in environments that do not promote optimal nutrition (Corkins et al., 2016). Globally, there are more moderately or severely underweight children and adolescents than obese ones, but obesity rates are projected to surpass underweight rates in the future (NCD Risk Factor Collaboration [NCD-RisC], 2017).

Childhood and adolescence are critical periods for appropriate health and development. Being underweight, overweight, or obese during these stages can have adverse health consequences throughout the life-course (Black et al., 2013). Underweight among children and adolescents is associated with higher risk of infectious diseases (Ibrahim et al., 2017; Grosso et al., 2020) and adverse pregnancy outcomes in girls of childbearing age (Black et al., 2013). Overweight in childhood and adolescence is associated with a greater risk and earlier onset of chronic diseases such as Type-2 Diabetes (Grosso et al., 2020). Additionally, childhood and adolescent obesity also have adverse psychosocial consequences and lowers educational attainment (NCD Risk Factor Collaboration [NCD-RisC], 2017).

A healthy diet is an essential factor in promoting optimal adolescent health and development, as it crucial for musculoskeletal growth, cardiorespiratory fitness, neurodevelopment, and immunity (Corkins et al., 2016). Healthy dietary practices should be established early in life since dietary behaviors formed during childhood and adolescence may persist into adulthood (De Vet et al., 2015; Corkins et al., 2016; Benedict et al., 2018). Furthermore, a healthy diet plays a significant role in preventing the development of diseases, particularly non- communicable diseases (World Health Organization [WHO], 2019).

The United Nations food summit defines a healthy diet as one that promotes health and prevents disease. It should provide adequate nutrients and health-promoting substances from nutritious foods, while avoiding excessive consumption of substances that harm health (Neufeld et al., 2023). For adults and adolescents, a healthy diet is defined as consuming at least 400 grams of fruits and vegetables (excluding potatoes, sweet potatoes, cassava, and other starchy roots), less than 10% of total energy intake from free sugars, less than 30 % of total energy intake from fat and less than 5 grams of salt per day (World Health Organization [WHO], 2020). The sources of healthy diet include fruit, vegetables, legumes, nuts, and whole grains (Dietary Guidelines for Americans [DGA], 2020; Ethiopian Food Based Dietary Guidelines [EFBDG], 2022). The exact make up of a balanced and healthy diet varies depending on individual and cultural characteristics as well as locally available foods, but the basic principles of a healthy diet remain the same across countries (World Health Organization [WHO], 2020).

Healthy diets represent an important pillar of efforts designed to facilitate the achievement of SDGs (Grosso et al., 2020). Adopting plant-based dietary patterns and reducing the intake of animal source foods are important components of healthier diets, which offer the best chance for promoting population and planetary health (Lucas & Horton, 2019). Conversely, unhealthy diets present a higher risk to morbidity and mortality compared to the combined risk posed by unsafe sex, alcohol, drug, and tobacco use (Willett et al., 2019). The current nutritional burden of high income countries is characterized by an increase in diet-related chronic diseases such as obesity, type 2 diabetes, cardiovascular disease (Rippe, 2019; Roser et al., 2021). Meanwhile most research in recent years in low- and middle- income countries (LMICs) has targeted maternal and child nutrition, aiming to interrupt the intergenerational cycle of malnutrition (Bhutta et al., 2017). LMICs are increasingly facing a double burden of malnutrition which often co-exists within communities, households and individuals (World Health Organization [WHO], 2017).

Ethiopia is classified as a low-income country according to the World Bank based on income (World Bank, 2021), and it has a significant population of adolescents and youth, with approximately 1 in 4 individuals aged between 10 and 19 (Admassu et al., 2022). Adolescent undernutrition remains a major public health problem in Ethiopia (Berhe et al., 2019) while the prevalence of overweight /obesity among children and adolescents is emerging as a nutrition related problem (Gebrie et al., 2018). Although malnutrition is prevalent among adolescents in

Ethiopia, nutritional interventions in the country are primarily focus on young children, pregnant and lactating women (Abera et al., 2023). As a result, the unique health and nutrition needs of adolescents are often overlooked (Worku et al., 2022; Abera et al., 2023).

In Ethiopia, there are distinct dietary patterns observed between urban and rural populations. Urban households allocate a larger portion of their food budget to animal source foods, oils, fats, fruits, and vegetables compared to their rural counterparts (Worku et al., 2017). Although the Ethiopian food supply is still remarkably high in complex carbohydrates, low in sugar, fat, protein and micronutrients, there is increased usage of maize and wheat at the expense of teff, and the introduction of palm oil as a fat source in recent years (Sheehy et al., 2019; Worku et al., 2017). This shift in dietary patterns may indicate the emergence of highly processed food supplies, which can be interpreted as the beginning of the nutrition transition (Sheehy et al., 2019). This nutrition transition is notable in adolescent age group compared with adults. In addition, there are notable differences in the quality of children's diets across wealth quantiles and between rural and urban areas (Baye et al., 2020). The eradication of all forms of malnutrition in Ethiopia is challenged by inequalities due to income, urban/rural residence, and gender (Kaleab & Kalle, 2020).

Injera is a sour fermented pancake-like flat bread and traditional common ethnic staple food consumed in all parts of Ethiopia (Mezgebe et al., 2020). However, small portions of rice, wheat, *enset* (which is a wild African banana relative, domesticated in Ethiopian high lands) based foods are consumed as staple food following injera (Neela & Fanta, 2020). Usually, injera is consumed along with the stew called *wot* which is made from vegetables or animal meat (Kebede, 1992). *Doro-wot* is a stew prepared from chicken, onions, red pepper, spices, butter, and water. *Shiro* is the most common wot prepared from lentils, pulses, spices, red pepper etc. (Zegeye, 1997). However, ‘injera’ is also consumed commonly with cooked meat, boiled vegetables like beetroot, cabbage, potato and, spinach, etc. (Neela & Fanta, 2020).

1.1. Significance of the study

Malnutrition in all its forms currently affects many adolescents globally and is considered one of the greatest public health challenges of our time (World Health Organization [WHO], 2021a). In Ethiopia, the inadequate consumption of a balanced and nutritious diet is recognized as a major contributing factor to the widespread issue of malnutrition (Ethiopian Food Based Dietary

Guidelines [EFBDG], 2022). Adolescence is a particularly relevant stage for understanding eating behaviors and establishing dietary habits that can influence health outcomes later in life. However, there is a limited number of studies on the perception and factors influencing adolescents' dietary choice in Ethiopia (Agedew et al., 2022). The objective of this master thesis is to explore adolescents' perception of a healthy diet and to identify the facilitators and barriers to adopting a healthy diet that are essential for planning relevant prevention programs.

1.2. Setting of the master's thesis

The study was conducted in Addis Ababa, Ethiopia, a land locked country which is located in East Africa (Ethiopian Ministry of Health, 2016). The estimated population of the country is 113,656,596 with 52% are aged between 15-54 years, and an estimated population growth rate of 2.5% (United Nations Population Fund [UNFPA], 2022; The World Factbook, 2023). Ethiopia ranked 175th on the Human Development Index (HDI) with and HDI of 0.49. The HDI is a summary measure of average achievement in three key dimensions of human development: a long and healthy life, knowledge, and a decent standard of living (United Nations Development Program [UNDP], 2022). Approximately one fifth of the population (23.2%) lives in urban areas. In terms of education and employment, nearly half of the population is literate, and the youth unemployment rate is 5.7% (The World Factbook, 2023).

Figure 1

Map of Ethiopia, location of the capital Addis Ababa and bordering countries

(https://www.burningcompass.com/countries/ethiopia/maps/ethiopia-region-map-hd.jpg)

Ethiopia's capital, Addis Ababa, is the largest city occupying a total of 540 square kilometers and having a population density of 5,165 people per square kilometer (Endris et al., 2022; Gule et al., 2023). Addis Ababa is one of the two self-governing chartered cities in Ethiopia. The city is divided into 11 sub cities called *kifle ketemas* which are further divided into *woreda* (Hassen et al., 2017). According to the governmental administration system, the lowest administrative unit is woreda (Destaw et al., 2021).

In Ethiopia, the education system comprises three years of pre-primary education, eight years of primary education, and four years of secondary education, which is further divided into two years of high school education and two years of preparatory education (Bauduy, 2008; Ministry of Education, 2020). A preparatory education program which includes grades 11 and 12 is available to all those who have obtained satisfactory grades in the Ethiopian General School Leaving Certificate Examination (EGSLCE) and offers students the option to select either a natural science track or a social science track (Ministry of Education, 2020). Both tracks share a core curriculum, which accounts for 60 percent of the coursework (Trines, 2018).

Addis Ababa has four types of schools: government-funded, public, private, and international. Government schools are fully funded and administered by government (Moges et al., 2018). These schools offer education for free, while private schools charge a fee for their services but often have superior facilities and more highly educated teachers (Trines, 2018). Families with limited financial resources are unable to afford the monthly tuition fees charged by private schools in the capital city, which can range from a few dollars to over USD$75, along with additional fees for registration and teaching materials (Trines, 2018). As of 2016, there were a total of 2,154 schools in the city, out of which 462 were government-funded, 28 were public, and 1,664 were privately owned (Moges et al., 2018). The city also had 1,133 pre-primary schools, 795 primary schools and 228 secondary that hosted more than 863,356 students (Ministry of Education, 2020; Melaku & Addis, 2023).

A large-scale School Feeding Program (SFP) was initiated in Addis Ababa in February 2019, aiming to provide meals to children in primary schools and alleviate hunger during class (Destaw et al., 2021; Melaku & Addis, 2023). The Addis Ababa School Feeding Program serves two school meals per day (i.e., breakfast and lunch each school day). The menu includes a total of 11 food items served for both breakfast and lunch throughout the week. The same meals are

provided in all government primary schools participating in Addis Ababa SFP (Destaw et al., 2022).

2.Background

2.1. Social inequality in nutrition

Our world is characterized by alarming rates of malnutrition, where food is not evenly distributed and food security is impacted by factors such as patterns of socioeconomic progress and the accessibility and distribution of natural resources (D'Odorico et al., 2019). According to the Food and Agriculture Organization, food security is defined as the condition in which all individuals have continual physical, social, and economic access to adequate, safe, and nourishing food that satisfies their dietary preferences and requirements for a healthy and active life (Food and Agriculture Organization [FAO], 1996). The lack of access to sufficient and nutritious food or consuming a diet lacking essential nutrients are immediate causes of malnutrition (Issahaku & Alhassan, 2021).

There is a link between socio-economic disadvantage and a less nutritious diet (Scott et al., 2019). Young individuals residing in low-income regions tend to consume fewer fruits and vegetables and more sugary food and drinks compared to their peers from more prosperous areas (Wills et al., 2019). Other studies suggest that adolescents' unhealthy eating and low physical activity levels are influenced by socioeconomic status (SES) (Abdelghaffar et al., 2020; Abera et al., 2020). Addressing these unhealthy behaviors has the potential to reduce the health disparities between adolescents from different SES groups and lower their risk of illness (Holmberg et al., 2018). Adolescents in Ethiopia, particularly girls, are impacted by various socio-cultural factors, such as gender-related, residential, and economic aspects, which influence their dietary habits and nutritional status (Abera et al., 2020; Digital,2022).

2.2. Adolescents as a group of study

Adolescents aged 10–19 years constitute 1.2 billion individuals globally, making them the largest generation in history (World Health Organization [WHO], 2022). Moreover, 90% of these adolescents reside in LMICs (Trübswasser et al., 2022). Adolescence is divided into three stages, early adolescence from age 10-13, middle adolescence from age 14-17, late adolescence from 18-21 years and beyond (Allen & Waterman, 2019). Adolescents are regarded as a vulnerable group because they undergo different biological, cognitive, and social changes during this life stage (Das et al., 2017).

Adolescence is considered as a nutritionally critical period of life for several reasons (Benedict et al., 2018; Vio et al., 2020). First, apart from infancy, growth during adolescence is faster than in any other period of life (Corkins et al., 2016). There is a 15–20% increase in height, 40–60% of peak bone mass is attained and up to 50% of adult body weight is gained which is the physical resource for the future life (Benedict et al., 2018; Taklual et al., 2020). At the same time, the adolescent brain undergoes tremendous growth and development partially shaped by social, emotional, and behavioral exposures. Social and economic resources that are the foundation for later life health and wellbeing are also acquired during this period (Patton et al., 2016; World Health Organization [WHO], 2018). The other reason is that adolescence can be the second opportunity for catch up growth if nutrient intake is favorable (United Nations Children Fund [UNICEF], 2018). Moreover, psychological changes and development of their own personality can impact on adolescents' dietary habits (World Health Organization [WHO], 2006).

Adolescence is a critical point for development of good health, as adolescents face challenges related to choices concerning their own physical and social environment and they begin to make their own eating decisions (Vio et al., 2020). Despite being a window of opportunity to halt the intergenerational cycle of malnutrition, adolescents have received minimal attention in global health and social policy until recently (Melaku et al., 2017; Mengesha et al., 2020). Investments in adolescent health and nutrition bring benefits today, for the coming decades, and for the future generations as well (Patton et al., 2016; Benedict et al., 2018).

2.3. Nutritional status of adolescents globally

Malnutrition can manifest in different forms, including undernutrition (lack of adequate food intake), overnutrition (consumption of too many calories), and micronutrient deficiencies (insufficient intake of essential vitamins and minerals) (Maleta, 2006). In adolescents ,undernutrition manifests in three broad forms: stunting, being underweight (thinness), and micronutrient deficiencies (World Health Organization [WHO], 2021a). Stunting refers to impaired growth and development which can be caused by poor nutrition and repeated infections. It is defined as height for age more than two standard deviations below the WHO child growth standards (World Health Organization [WHO], 2015). Underweight (Thinness) is defined as body mass index (BMI) for age 2 Standard deviations below the median of WHO growth reference (Querol et al., 2022).

The other type of undernutrition, micronutrient deficiency is defined as lack of vitamins and minerals that are essential for body functions such as producing enzymes, hormones and other substances needed for growth and development (World Health Organization [WHO], 2021a). Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health. For the children and adolescents (5-19 years) overweight is BMI-for-age greater than 1 standard deviation and obesity is greater than 2 standard deviations above the WHO growth reference median (World Health Organization [WHO], 2021b).

Adolescent overnutrition is increasing and has become one of the emerging public health challenges of this century (United Nations Children Fund [UNICEF], 2020). From 1975 to 2016, the prevalence of overweight or obesity in children and adolescents aged 5–19 years increased more than four-fold from 4% to 18% globally (World Health Organization [WHO], 2021b). Moreover, a 12% increase is seen from 2010 to 2016 on the prevalence of obesity in adolescents aged 15-19 years (Belay et al., 2022). In another study, overweight was shown to affect 207 million (17.3%) of adolescents worldwide (Stevens et al., 2012).

2.4. Nutritional status of adolescents in Ethiopia

One in four Ethiopians is a young person aged 10–24 years. Adolescents 10 to 19 years constitute around 23 % of the total population (United Nations Population Fund [UNFPA], 2022). Ethiopia has the second-largest youth population in Africa with about 37.4 million people aged 10–24 years (Admassu et al., 2022). Poor nutritional status is one of several burdens facing adolescents and youth in Ethiopia. Other factors include teenage pregnancy, unplanned pregnancy, Human Immunodeficiency Virus (HIV) and other sexually transmitted infections, unsafe abortion, early marriage, and unmet needs for family planning (Abraham et al., 2019; Admassu et al., 2022). A significant number of youths are living in poverty ,unemployment being one of the reasons for poverty and compromised nutrition while migration from rural to urban area aggravates this situation (Ethiopian Ministry of Health, 2016).

The prevalence of undernutrition among adolescents in Ethiopia is remarkably high. According to the 2011 and 2016 Ethiopian demographic and health survey (EDHS) the prevalence of underweight among adolescent girls was 36% and 29%, respectively (Central Statistical Agency [CSA], 2011; Central Statistical Agency [CSA], 2016). A systematic review that included 22 studies, found that the pooled prevalence of stunting and underweight among adolescents was

20.7% and 27.5% respectively (Berhe et al., 2019). Among adolescent girls, the prevalence of stunting is estimated to be around 15%, with 12.9% moderately stunted and 2.2% are severely stunted (Abate et al., 2020). In a recent systematic review that included 76 articles, the pooled prevalence of stunting was found to be 22.4% (Abera et al., 2023).

On the other hand, the prevalence of adolescent overweight and obesity is also increasing. In a recent systematic review, the combined pooled prevalence of overweight and obesity among children and adolescence was estimated at 11.3% where the separate pooled prevalence of overweight was 8.9% and the obesity prevalence was 2.4% (Gebrie et al., 2018). This can be taken as evidence for the emerging double burden of malnutrition (Teferi et al., 2018; Fitsum et al., 2021).

In Ethiopia, a significant proportion of adolescents face nutritional challenges including micronutrient deficiencies. Anemia affects 20% of girls and 18% of boys (Central Statistical Agency [CSA], 2016) while national estimates of anemia among adolescents is 14%. The prevalence of iodine deficiency and associated risk of goiter among Ethiopian adolescents ranges from 40-52% (Abera et al., 2023). Vitamin D and zinc deficiency were also common among Ethiopian adolescents estimated to be 42% and 38% respectively. Furthermore, 15% of adolescents are folate deficient, and 6.3 % have a deficiency in Vitamin A (Abera et al., 2023).

There is variation in the prevalence of undernutrition and overnutrition among adolescents based on gender and region within the country. In Addis Ababa, the prevalence of stunting is 8% among school attending adolescents where male adolescents were found to be 2 times more stunted than females (Yallew et al., 2022). The prevalence of overweight and obesity is also estimated to be 8% among adolescents aged 10-14 years in Addis Ababa where it was significantly higher in females compared to males (Drysdale et al., 2023).

2.5. Factors associated with adolescent malnutrition in Ethiopia.

According to UNICEF, the main causes of childhood malnutrition can be categorized into three main underlying factors. These are household food insecurity, inadequate care and an unhealthy household environment, and lack of health care services (Tette et al., 2015). The factors affecting childhood nutrition are important determinants for nutritional status in adolescents. Moreover good nutrition during adolescence is critical to cover the deficits suffered during childhood

(Aurino et al., 2019). Household food insecurity, low financial income and unemployment have been identified as determinants of the double burden of malnutrition among Ethiopian adolescents (Jikamo & Samuel, 2019; Getacher et al., 2023). Data on the food security status in Addis Ababa is limited; however, one cross sectional study found that 82% of households and about 88% children and adolescents were food secure (Biadgilign et al., 2021).

Various studies have identified the factors that lead to malnutrition among adolescents in the different regions of Ethiopia. Factors like family size, paternal or maternal educational status, less dietary diversity, poor dietary choice and consumption of unhealthy foods, family wealth status (having monthly income <1000 birr), living in rural parts of the country, being in the early adolescence stage, being male, lack of safe water, unhygienic toilet or lack of latrine, and having no visits by health extension workers are identified as the determinants for stunting and underweight for adolescents (Berhe et al., 2019; Abate et al., 2020; Mengesha et al., 2020; Zelalem et al., 2020; Handiso et al., 2021).

Determinants of overweight and obesity are identified as living in an urban area, female gender, high family socioeconomic status, attending private school, physical inactivity, longer sleep duration, sweet nutriments preference and less use of fruits/vegetables (Gebrie et al., 2018; Destaw et al., 2022; Abera et al., 2023). In addition to these factors, watching TV or movies for 3 hours and more per day, poor nutritional knowledge and consuming soft drinks 3 times and more per week are also found to be determinants for overweight and obesity among adolescents, in a case control study conducted in southern Ethiopia (Kedir et al., 2022).

2.6. Factors affecting perception and intake of a healthy diet among adolescents.

The socio-ecological model (SEM) was first proposed by Urie Bronfenbrenner, an American developmental psychologist, in the 1970s (Bronfenbrenner, 1977; Bronfenbrenner, 2005). It emphasizes the importance of understanding the complex interactions between individuals and their environment, and how these interactions shape behavior and development (Kilanowski, 2017). The SEM was later adapted and expanded by researchers in the field of public health to address health promotion and disease prevention presenting a broader perspective (Mahmudiono et al., 2019). The model recognizes that public health issues are complex and cannot be fully analyzed or addressed through isolated approaches (Center for disease control and prevention

[CDC], 2015). It employs a comprehensive approach that includes various levels of influence to shape health behavior and achieve positive health outcomes (Kellou et al., 2014).

Given the complex and multi-dimensional nature of factors that influence healthy dietary choices among adolescents, the socio-ecological model (SEM) presents a valuable framework for understanding and addressing these factors (Fenta et al., 2023). The SEM encompasses individual, interpersonal, organizational, and community level factors, which have a significant impact on the dietary choice of adolescents (Robinson, 2008; Caperon et al., 2019). Social factors at personal, family, community, and national levels have been found to be particularly influential (Robinson, 2008 ; Viner et al., 2012). Therefore, this study will employ the socio-ecological model to explore perception of healthy diet among adolescents, with the goal of advancing our understanding of the factors that affect dietary behaviors. By using this integrative framework, we hope to identify opportunities for enhancing the dietary behaviors of adolescents.

Social cognitive theory (SCT) is a widely acknowledged theory in health promotion for understanding health behaviors due to the interactions between individuals, environment, and behavior (Shamizadeh et al., 2019). Social cognitive theory addresses psychosocial factors and motivations influencing health behaviors and methods to promote sustained, translatable behavior change (Doerksen & McAuley, 2014). It also considers individuals' prior behavior, cognitions, social environment, and physical environment to predict future behavior which makes it a commonly applied behavior change theory to various health interventions addressing diet, physical activity, or weight loss (Doerksen & McAuley, 2014; Wong & Monaghan, 2020)

Social cognitive theory recognizes the reciprocal determinism of behavior, where both the person influences their surroundings, and the surroundings influence the person. SCT involves three triads of human behaviors (Anton et al., 2021). These are individual cognitive factors of knowledge, expectations, and attitudes; behavioral factors of skills, practice, and self-efficacy; and environmental factors of social norms, access, and influence of others on their environment, Behavior is driven by all these three factors (Harris et al., 2021).

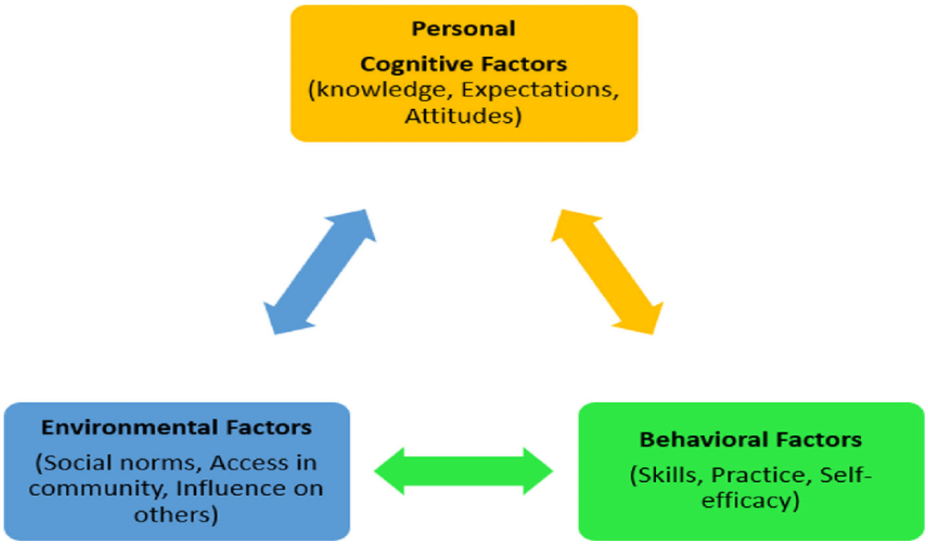

Figure 2

Reciprocal interaction among the three factors in Bandura's social cognitive theory (Bandura, 2004)

(https://www.researchgate.net/publication/340807167/figure/fig3/AS:882735514132483@1587471955245/Social-Cognition-Theory-basic-diagram.png)

In developing behavior change interventions, core constructs such as self-efficacy, outcome expectations, self-regulation, and perceived impediments and facilitators of behavior play a crucial role in explaining health behaviors including dietary change (Bandura, 2004). Self-efficacy refers to an individual's belief in their own abilities, which can influence other constructs (Bandura, 2004). When a person has a strong sense of self-efficacy, they are more likely to expect positive outcomes from their actions and put forth the necessary effort to overcome obstacles, leading to a positive impact on their behavior and overall success (Doerksen & McAuley, 2014). Behavior change is initiated and maintained when individuals feel that they can execute the desired behavior and have a reasonable expectation that the behavior will result in a desired outcome (Wong & Monaghan, 2020). A comprehensive approach to health promotion also requires changing the practices of social systems that have widespread effects on human health (Bandura, 2004).

This study examines multiple factors that influence dietary behavior, including personal cognitive factors such as the individuals' definitions of a healthy diet, reliance on information sources, and examples of healthy and unhealthy foods. It also assesses current food choice and changes in dietary habits as behavioral factors, along with environmental factors such as barriers and facilitators of a healthy diet, and the impact of advertisements. The socioecological model considers factors at the interpersonal, organizational and community levels (Robinson, 2008) , which are environmental factors in social cognitive theory. These factors both affect and are affected by both dietary behavior and the intrapersonal or individual level factors (Bandura, 2004). Therefore, integrating the socioecological model and the social cognitive theory can provide a more holistic understanding of the factors that influence healthy dietary choices among adolescents, leading to the recommendation of effective interventions to promote healthy eating behaviors.

2.6.1. Individual and intrapersonal factors

Food consumption is shaped by personal and behavioral factors such as nutritional knowledge, expectations, and attitude towards certain foods, skills and self-efficacy (Bandura, 2004). A systematic review of 23 studies found that habit, motivation, goal, beliefs about capabilities and knowledge were the most consistent variables determining fruit and vegetable consumption among adults (Guillaumie et al., 2010). Other studies identified self-efficacy, knowledge and perceived benefits as determinants of change in nutrition behavior in low income population (Steptoe et al., 2004; Anderson et al., 2010). In a more recent study among African American adolescents, that used social cognitive theory to explain sugar consumption, it was found that a higher sugar-sweetened beverage (SSB) consumption was associated with lower outcome expectancies (Fajarini et al., 2021). Another systematic review study conducted among children identified that those with high self-efficacy were more likely to consume fruits and vegetables, and less likely to consume foods high in fat, sugar, and sodium (Hong, 2016).

Two studies, one from the US and the other from India and Canada found that adolescents considered a balanced and varied diet that includes fruits, vegetables, and foods rich in vitamins and minerals healthy. Conversely, fast food, processed foods, sugary and calorie-dense foods, as well as fats and oils, were regarded as unhealthy and should be avoided (Tiedje et al., 2014; Correa et al., 2017). Similarly, a study on Latino adolescents identified fruits, vegetables, and

organic foods as expensive yet healthy options, regardless of their ingredients. In contrast, high-calorie and low-nutrient foods such as soda, chips, candy, cookies, and fast food were deemed unhealthy (Beck et al., 2019).

Locally grown traditional foods, especially fruits and vegetables were considered healthy in a study done among adolescent girls in rural parts of South Africa (Sedibe et al., 2014). In a previous study done in Addis Ababa, adolescents considered packed foods and clean vegetables as healthy, while fried foods which are prepared on the roadside and fruits and vegetables sold on the carts which are unclean were perceived as unhealthy food (Trübswasser et al., 2022).

According to a study in Chile, adolescents in public schools perceived the pleasant taste of high calorie junk food and improved satiety after consuming such foods as significant barriers to healthy eating. They also reported that unhealthy foods have addictive properties that make it difficult to stop eating once they start (Vio et al., 2020). In a study conducted in Brazil, the main causes of inappropriate eating practices among adolescents were related to the greater preference for nutritionally inappropriate foods (Madalosso et al., 2020).

In a study among Indian adolescents, benefits of healthy eating included improved energy and disease prevention. Personal taste preference was one of the facilitators of healthy dietary consumption (Correa et al., 2017). Body weight perceptions could also influence the consumption of healthy foods and the quality of diet, especially for those who considered themselves overweight. A negative body image increased the risk of engaging in unhealthy dieting and disordered eating pattern (Mbogori & Arthur, 2019).

Nutrition literacy is the ability to obtain, process, understand and use correct nutrition information and nutritional knowledge to make healthy food choices (Taylor et al., 2019). The finding from a recent study in Turkey suggests that food habits of adolescents have changed positively with increasing nutrition literacy (Koca & Arkan, 2020). According to Szabo et al, adolescents can relate healthy eating with the concepts of balance and moderation. Self-control plays a decisive role, both directly and indirectly. Eating motives were also directly related to eating attitudes but in a different way: health motives were positively associated with healthy eating attitudes of adolescents, while social and external motives had a negative relationship (Szabo et al., 2019).

Among adolescents in Malaysia, perceptions of healthy and unhealthy eating were determined based on food types and characteristics, cooking methods, and eating behaviors (Ishak et al., 2020). In Ethiopia, facilitators for practicing a healthy diet included being concerned for one's own health and body, knowledge of healthy or unhealthy eating and general knowledge of nutrition and food safety. Barriers for healthy eating were identified as taste and characteristics of foods, and lack of knowledge of healthy or unhealthy foods (Trübswasser et al., 2021; Fenta et al., 2023). Despite having knowledge of healthy eating, Adolescents were inclined towards an unhealthy diet due to the taste of fried and sweet foods (Trübswasser et al., 2021).

2.6.2. Interpersonal factors

At this level of the socioecological model, social interactions and relationships with others, social support from family, friends, or peers can influence food choices and eating habits which play a role in shaping dietary behaviors (Center for disease control and prevention [CDC], 2015). Adolescents' immediate environment (home, school, neighborhood market, restaurants) and the direct relationship with those people within the environment influence their dietary practice (Fox & Timmer, 2020). A systematic review study of 16 studies, identified the significant correlations between parental influence and dietary behavior in children and adolescents 4-18 years of age (Hong, 2016).

Peers are also a major source of influence on adolescents' food choice as they spend more time away from home and have autonomy in controlling their diet (Fox & Timmer, 2020). Researchers suggest that peer influence becomes salient in late adolescence. For example, in United Kingdom adolescents 15-19 years of age were more influenced by their peers compared to adolescents 12-15 years of age who were more influenced by parental views (Emergency Nutrition Network (ENN), 2018). In a study conducted among Canadian and Indian adolescents, peers were identified as barriers in both groups, while limited parental supervision during mealtimes was listed as a barrier to having a healthy diet specifically among Canadian girls. (Correa et al., 2017).

In another study from Brazil, adolescents looked to their friends and family in making healthy food choices (Madalosso et al., 2020). According to a study done among African American adolescents, higher diet quality scores were related to higher levels of perceived parental and peer support for healthy eating behavior (Wrobleski et al., 2018). Increased sedentary behavior

while sitting with friends influences adolescents' patterns of physical activity which is also associated with increased snacking (Corkins, 2016).

Adolescents in Ethiopia reported that peer influence strongly affected their dietary choices, often leading them to choose unhealthier options (Trübswasser et al., 2021). Family influence was found to have both positive and negative impacts on adolescents' eating habits (Agedew et al., 2022). In government schools, family influence limited adolescents' choices, while in private schools, mothers had a positive influence due to their concern for children's health and fathers had a negative impact by purchasing unhealthy foods. Furthermore, the Ethiopian tradition of sharing and eating together was identified as a motivating factor for making healthy food choices (Trübswasser et al., 2021).

2.6.3. Organizational factors

The types of food available in markets, shops and food outlets and their prices depend on the region, trade policies and broader characteristics of the physical and social environment. Availability of food for adolescents varies significantly depending on urban or rural setting, socioeconomic status, gender, and ethnicity (Fox & Timmer, 2020). The availability, access and affordability of unhealthy diets were identified as barriers for consuming a healthy diet among Indian & Canadian adolescents (Correa et al., 2017). Studies show that the abundance and promotion of affordable but unhealthy food, food safety concerns and social desirability of foods drive consumption of unhealthy foods among adolescent girls in low- and middle- income countries (Trübswasser et al., 2021). In a study done in Brazil, easy access to unhealthy foods were mentioned as the reasons for inappropriate eating practices. These findings show that dietary choices are not only influenced by subjective aspects related to knowledge and perceptions, but also economic, social and cultural factors (Silva et al., 2015).

Marketing and advertising impact the types of foods adolescents desire and add to the overwhelming amount of information available to adolescents (Kraak et al., 2016). In low- and middle- income settings, adolescents are often targeted as independent consumers by fast food chains and transnational industries that rely on children to expand their markets in these settings (Fox & Timmer, 2020). Media and digital communications also influence social environments in terms of body image which is a concern among adolescents. Media messaging about ideal body weight and composition is well documented in high income settings as well as in low and middle

income, urban settings (Knauss et al., 2007). In a systematic review study, social media engagement or exposure to image-related content was associated with higher body dissatisfaction, dieting/restricting food, overeating, and choosing healthy foods (Rounsefell et al., 2020).

Hygiene and sanitation are important factors that should be considered at the organizational level. In a previous study conducted in Addis Ababa, adolescents mentioned they were motivated to buy from clean and neat food vendors which had attractive arrangement of products (Trübswasser et al., 2021). Considering that the food environment lacks hygiene, eating food which was prepared at home was considered the healthiest, cheapest, and safest option. (Trübswasser et al., 2021).

2.6.4. Community factors

Social norms that adversely affect diets across the life course have been identified as community level factors that influence dietary choice among adolescents (World Food Program [WFP], 2018). Broader cultural factors and social norms are challenging to change, yet they significantly impact on the diets of adolescents. Social norms can be categorized as descriptive or injunctive. Descriptive norms reflect the extent to which others engage in a particular behavior, while injunctive norms indicate the level of approval or disapproval from others regarding a specific behavior (Zou & Savani, 2019). Descriptive social norms have shown a strong association with the consumption of fruit and vegetables, sugar-sweetened drinks, and unhealthy snacks indicating their influence on dietary practices among adolescents in the United Kingdom (Lally et al., 2011).

2.6.5. Macro level factors

Public policies and programs which can be employed across the food system also have direct and indirect impacts on the diets of children and adolescents (Morris et al., 2020). Policy needs to sensitively account for the evolving characteristics and needs across childhood and adolescence. For instance, school feeding programs which provide the same portion sizes for both young children and adolescents often do not meet adolescents' dietary needs (Drake et al., 2017).

Food safety regulations are essential for intervening and improving the poor hygiene practices in food outlets. Regulating food prices in accordance with a country's economy is suggested as a macro-level factor that influences dietary choices (Trübswasser, et al., 2021).

An unhealthy diet serves as a significant preventable risk factor for noncommunicable diseases. Poor dietary habits established during childhood might persist into adulthood, making it crucial to focus on the dietary habits of children and adolescents (Mahmood et al., 2021).Considering the intricacy of dietary behaviors and the diverse range of influences on diet, it is essential to assess the perceptions and factors that impact adolescents' dietary choices. Limited studies have been conducted to examine adolescents' dietary perceptions in Ethiopia. Furthermore, this study aimed to investigate the perception of a healthy diet, the factors influencing dietary choices, and teachers' perceptions of adolescents' dietary habits in Ethiopia. The findings from this study can contribute to the development of robust interventions that promote healthy dietary practices among adolescents.

3. Objectives

3.1. General objective

To explore the perceptions of a healthy diet and dietary habits among adolescents in Addis Ababa, Ethiopia

3.2. Specific objectives

To explore adolescents' food habits

To describe adolescents' perceptions of healthy and unhealthy diets

To explore factors influencing adolescents' (healthy) dietary choice

To explore the school food environment

To explore teachers' perception regarding school adolescents' food choice

To suggest initiatives improving adolescents' food habits

4.Methods

4.1. Qualitative research design

The study has a qualitative research design. Qualitative research is a way of learning about social reality, which is often used to explore, describe, or explain social phenomena, unpacking the meanings people ascribe to activities, situations, events, or artifacts (Creswell & Poth, 2018; Tenny et al., 2023). It builds a depth of understanding about some aspects of social life (Leavy, 2020). Maxwell (2013) describes qualitative research as an inductive and reflective process. This type of study is flexible to discuss multiple perspectives and to describe the different factors involved in a situation. It is not limited to the cause-and-effect relationship between the factors but focuses on describing the complex interaction of factors to sketch the larger picture that emerges (Creswell & Poth, 2018).

In qualitative research design, the focus is on the meanings that the participants in the study setting attach to their social world. Its strength is the ability to study people in the 'field' (Bowling, 2014). The researchers are considered as instruments, while research participants are valued as knowledge bearers and co-creators (Saldana, 2011). There are different types of genres within this research design which vary with inquiry approach, representation, and presentation of the study (Renjith et al., 2021).

From the philosophical point of view, this research inclined to the interpretive paradigm (Bowling, 2014) as goals of the study are to explore, describe and interpret healthy diet and the factors affecting dietary choices from the perspective of adolescents.

4.2. Methods of data collection

Focus group interviews and participant observation were the methods used for data collection. Focus group discussions were selected as the method of data collection for this specific study because perceptions of healthy and unhealthy diets, as well as the factors influencing adolescents' dietary choices, could be better identified when new knowledge is formed during the discussions among participants. Additionally, observations could contribute to identifying their eating practices and the school food environment.

An interview is described as "a professional conversation" which goes beyond the spontaneous exchange of views as in everyday conversation and becomes a careful questioning and listening

approach with the purpose of obtaining thoroughly tested knowledge (Brinkmann & Kvale, 2018). Knowledge is constructed in the inter-action between the interviewer and the interviewee. An interview is literally an inter-change of views between two people conversing about a theme of mutual interest (Kvale & Brinkmann, 2009). According to Moen & Middelthon (2015), an interview should be conceived of as a triadic (three-sided) relationship involving the interviewer, the interviewee and the theme or topic they are engaging with and that engages them.

A focus group discussion is a kind of interview where a group of people are, brought together, to discuss, or focus on, a specific research issue, or issues, to enhance understanding, using open-ended questions (Bowling, 2014). A focus group interview is characterized by a nondirective style of interviewing, where the prime concern is to encourage a variety of viewpoints on the topic in focus for the group (Hennink, 2013). It usually consists of six to ten subjects led by a moderator where the moderator's task is to create a permissive atmosphere for the expression of personal and conflicting viewpoints on the topics in focus (Renjith et al., 2021).

Focus group interviews are well suited for exploratory studies in a new domain, as the lively collective interaction may bring forth more spontaneous expressive and emotional views than in individual, often more cognitive, interviews (Creswell & Poth, 2018). Qualitative interviews have also been conducted within focus groups to better understand the motivations of consumers (Kvale & Brinkmann, 2009). The researcher tried to build a trustful situation with the participants starting from the start to the end of the interview. This includes greetings when they come in, describing the study, its confidentiality and inviting them to discuss the topic freely (Bowling, 2014).

Observation is the process of noticing and recording what goes on and transpires in the field (Bowling, 2014). Participant observation is a research strategy that aims to produce knowledge both on and through interactions between people (Lofland et al., 2022). In participant observation, researchers join people in a few or many of their life contexts which affords opportunities to learn and understand not only through conversation and discussion, but also through the socialization and enculturation that follows when people experience and perform social and practical acts, tasks, and practices together (Moen & Middelthon, 2015). This method allows researchers to observe what people do, while all the other empirical methods are limited to reporting what people say about what they do (Atkinson & Delamont, 2010).

4.2.1. Data collection procedures

The data collection took place from November 2022 to January 2023. On average, 3-4 days were spent collecting data in each school. A camera and an audio tape recorder were used to collect the data. The camera was used to capture the food that the students consumed during breakfast and lunchtime, as well as the school food environment. The audio recorder was used to record the focus group discussions. Both verbal and written consent were obtained to take the pictures used in this thesis. All the focus group discussions were conducted in the school and carried out in the Amharic language.

4.2.2. Data collection tools

Interview guide

The focus group interview guide was semi structured, which is important for asking questions with some degree of premeditated "direction," maintaining a considerable degree of flexibility and openness built into them (Mashuri et al., 2022). This makes it possible to incorporate and pursue emerging themes and topics as they arise, both during each individual interview and during the course of the study (Moen & Middelthon, 2015). The focus group interview guide consisted of main questions in line with the objective of the study and probe question which were used to elaborate the main questions. The student focus group interview guide consisted of 10 main questions and the teacher focus group discussion had 7 main questions which helped to answer the research objective.

The semi-structured interview guide was developed based on the literature review on qualitative methods. The questions were categorized using the socioecological model and Bandura's social cognitive theory. Personal cognitive questions were included to explore how the students perceive a healthy diet and which foods they categorize as healthy and unhealthy. Behavioral questions were used to gather information about the students' current dietary habits, while questions about barriers and facilitators of a healthy diet were employed to describe the environmental factors.

Observation guide

The observation guide helps maintain the observer's focus by reminding the key points and topics of interest. It also allows the observer to reflect on their own relationship and contribution to the observed individuals or events at any given moment (Roller, 2021). In this study, the observation guide consists of 5 main questions to be answered while observing the student's meal and school food environment. These observation questions were prepared to get insight about the food types consumed by students for breakfast and lunch and the food items available in the school canteen as well as within the school environment. Observation helped to explore the actual dietary habits of the students, providing details students may not have shared during the focus group discussions. Using observation in addition to focus group discussions, the study employed a method of triangulation. Triangulation is one way of strengthening a study by combining multiple methods which can be accomplished in various ways (Tracy, 2010). Methodological triangulation, specifically involves using multiple methods to study a single problem (Patton, 2015).

4.3. Sampling and recruitment

Qualitative sampling designs are developed by the researcher based on the objectives of the study and do not have stringent rules regarding the sample size (Baker & Edwards, 2012). The sample size depends on the research purpose, what is at stake, what is useful, what is credible, and what line of research can be pursued within the given timeframe and available resources (Vasileiou et al., 2018). Purposeful sampling is a method where information-rich samples are selected to process relevant characteristics related to the topic of discussion (Shaheen et al., 2019; Renjith et al., 2021). The effectiveness and strength of purposeful sampling rely on selecting information-rich cases for in-depth study, which enables the researcher to obtain sources of information to address the research objectives (Shaheen et al., 2019). In this study, schools were selected based on the assumption of social inequality to involve schools with students from different socioeconomic status. The purposeful sampling technique was employed, with the assistance of teachers in identifying students and school unit leaders assist in identifying teachers who could participate in the focus group discussions.

The plan was to conduct 12 focus group discussions. For this study two sub cities were chosen from a total of 11 sub cities, one representing areas of higher socioeconomic status and the other

representing relatively low socioeconomic areas. In each selected sub city, one private school and one governmental school were chosen based on the recommendation of the sub cities education bureau. This study included a total of four different schools: two governmental schools and two private schools. In each school, the researcher conducted one focus group discussion with male students, one with female students, and one with teachers. The number of focus groups was decided based on the concept of meaning saturation in stratified groups. The level of group stratification had an impact on meaning saturation, with at least one focus group per stratum necessary to identify key issues. Having two groups per stratum resulted in a more comprehensive comprehension of the issues (Hennink et al., 2019).

Recruitment procedures

The recruitment procedure began by establishing contact with the Sub city educational bureau in each of the two sub cities where the schools are located. Subsequently, the recruitment of students and teachers was conducted through discussions with the school principals. Permission and approval for the school's participation in the research project were obtained from the principals of all four schools. A meeting was held with the school principal and a teacher representative to discuss practical matters, such as the procedures for observation and focus group discussions within the schools.

All participants received information letters that described the main purpose of the study, provided information about the data collection procedures, and emphasized their right to voluntarily withdraw from the research at any time. The participants then signed a consent form.

4.3.1. Sampling of students

The school management contacted the teachers of grades 11 and 12 to assist in recruiting the students. To ensure group balance, students from different classes, who the teachers believed could represent others, as well as those who volunteered to participate, were interviewed. Separate focus group discussions were organized for boys and girls in each school, considering potential gender differences, to create an environment where students could freely express themselves and comfortably share their opinions.

4.3.2. Sampling of teachers

The school management helped to recruit teachers for the focus group discussions. Those who volunteered to participate in the focus group discussion were selected for the study.

4.4. Piloting

It is valuable to conduct pilot studies as they assist in obtaining the meaning of the interview questions, structuring the questions, and gauging the researcher's effectiveness as a moderator (Breen, 2006). Prior to conducting the first focus group, the interview guides were discussed with my supervisors. Two pilot focus group discussions were conducted in Oslo, Norway. The first pilot group involved 3 PhD students and 1 master's degree student all Ethiopian and speaking Amharic language. This provided an opportunity for the researcher to practice moderating the focus group interview, determine the time required to answer each question and receive feedback from the participants. The duration of this interview was approximately 2 hours. The second pilot group discussion included three master's degree students as participants, which was observed by my supervisors. This interview lasted around one hour. The researcher received valuable comments from the supervisors on moderating focus group discussions which were crucial for conducting the subsequent interviews. The second pilot study was partially transcribed and used for the Exam assignment of PHVIT 9200 qualitative methods attended by the master's student at Oslo Metropolitan university.

4.5. Conducting focus group interview and participant observation

4.5.1. Focus group interview.

The focus group discussions were conducted face-to-face in the respective schools, with the researcher serving as the moderator for all sessions and taking notes during the interviews. In most of the discussions, an assistant moderator was present responsible for tasks such as preparing the rooms for the discussions and ensuring clear recordings by adjusting the sound recorder as needed for the participants. This assistance proved helpful in the transcription process. Each school hosted two focus group discussions with the students, and one focus group discussion was conducted with the teachers. Each group comprised 5-7 participants, and on average, the duration of each focus group session was 30 minutes.

4.5.2. Observation

The researcher conducted observations for three days in each school while students had their breakfast and lunch. Both students who brought food from home and those who ate food from the school canteen were observed. The duration of each observation session ranged between 30-40 minutes. In this study, the researcher participated as an observer. Taking notes during the observation was challenging as the researcher was capturing pictures of the food and the food environment. The pictures taken during the observation, which provide insights into the students' dietary habits as well as the school food environment, are presented in the results section of the study.

4.5.3. Audio recording

All focus groups were recorded with a digital audio recorder (model: Olympus WS-853). MP3 files were stored on an SD card and downloaded as soon as possible to the researcher's computer and stored there.

4.5.4. Transcription

Transcription refers to the transformation of recorded audio (usually spoken word) into a written form that can be used to analyze a particular phenomenon or event (Halcomb & Davidson, 2006). The transcriber therefore has to make subjective decisions throughout about what to include, whether to correct mistakes and edit grammar and repetitions. This has been described as a spectrum between "naturalized" transcription (or "intelligent verbatim") which adapts the oral to written norms, and "denaturalized" transcription ("full verbatim"), where everything is left in, including utterances, mistakes, repetitions and all grammatical errors (McMullin, 2023).

The interviews were transcribed fully verbatim (denaturalized transcription) to retain as many details as possible to ensure reliability. This included "ehm" and longer breaks and emotions like laughter and other descriptions of nonverbal language. F4transcript was used to transcribe the interviews. The data were anonymized immediately by using pseudonyms while transcribing the interviews. Each participant got a code to ensure anonymity. For example, the code MSM1 (Medhanialem school male 1) stands for a boy in the governmental school and pupil number 1. The code key was stored separately from the dataset. The data was transcribed in Amharic language which is the language spoken in the focus group interviews.

4.5.5. Translation

Translation involves interpretation of texts that convey the meaning and not solely a word-to-word translation. There is no consensus regarding the optimum timing of translation during qualitative data analysis (Aloudah, 2022). In this study, after transcribing the data the full text was translated from Amharic to English language by using google translate. The researcher then read the English version to make sure it conveys the same message as the Amharic version and tried to correct it accordingly.

4.6. Analysis

The analysis was based on the interview transcripts and observation notes. The transcripts and observation notes amounted to a total of 350 pages of data material. The documents were imported into NVivo 12, a computer software for qualitative data analysis. Thematic analysis as described by Braun and Clarke was employed as the method of analysis incorporating both inductive and deductive approaches. The deductive approach utilized a theory driven framework (i.e., the socioecological model) for identification of relevant themes. In addition inductive code emerged from the data (Braun & Clarke, 2022).

Braun & Clarke (2022) outlined six phases for conducting thematic analysis. The initial step in qualitative data analysis is to become familiar with the data. It is recommended to read through the entire data set at least once before starting the coding. In this study, all documents were thoroughly read to make meanings from the interviews. The researcher conducted data collection, transcribed the text, and translated it from Amharic to English language. This process helped the researcher become familiarized with the study. The second step is coding followed by generating initial themes and subsequently developing and reviewing those themes as described in detail in section 4.6.1 and 4.6.2. The fifth phase involves refining, defining, and naming the themes, which were presented in the results section. The last phase is writing up the report (Braun & Clarke, 2022).

4.6.1. Coding

Codes are used to identify interesting features of the data whether they are semantic or latent and to represent the fundamental segments or elements of the raw data that can be meaningfully assessed in relation to the phenomenon. Initial coding involves generating an initial list of ideas

about the data and what makes them interesting (Braun & Clarke, 2022, p.57-61). The coding process was conducted by the researcher.

Initially, the codes were descriptive and based on the discussions in the focus groups. As the analysis progressed, more analytical codes emerged from the data. Some examples of the initial codes that emerged early in the analysis process included: "Three meals in a day," "Breakfast meals," " Healthy diet for disease prevention," "Family as a motivator of a healthy diet," "Advertisement as a barrier of a healthy diet," "Healthy diet are nutrient dense," "Education for maintaining a healthy diet," "Examples of a healthy diet," "Preference for adopting an unhealthy diet," "Changes in food portion size," and " Changing food choices with friends."

The codes in the data were continuously compared to new data from subsequent interviews to identify similarities and differences. As the coding process progressed, it became easier to assign codes to new data by utilizing existing codes, if applicable. If a new idea emerged from the transcript that was not related to any previous code, a new code was created, and this process was repeated until the end of the coding process. This type of coding eventually led to a theoretical categorization of the initial codes.

4.6.2. Generating initial themes

This step, which focuses on analysis at a broader level of themes, began after all data had been initially coded. Codes that were related and formed a theme were identified using visual representations combined with an overarching theme. At this stage, the different codes were sorted into potential themes, and all relevant coded data extracts were collated within the identified themes (Braun & Clarke, 2022). Initially, five themes were identified: "What constitutes a healthy diet for adolescents?" "Current dietary practices," "Changes in dietary habits," "Factors influencing healthy dietary practices," and "Strategies to improve dietary habits." After formulating the themes, the codes related to the relevant text in the interviews that fit into each theme were repeatedly identified and organized to find the most meaningful arrangement.

After revision of identified themes and codes, these were the final identified themes: "The current food habits," "Adolescents' perception of a healthy diet and unhealthy diet," "Factors influencing adolescents' dietary habits," and "Possible solutions to improve unhealthy dietary

practices". Subthemes include "What does a healthy diet mean?" "Is the student's current dietary habit healthy?" "Sources of information," "Intrapersonal factors," "Interpersonal factors," "Organizational factors," "Community factors," and "Macro-level factors".

4.7. Researchers' role and preconception

After the interview, reflecting and writing about the experience of the interview provides the opportunity to acknowledge and reflect on what has transpired during the interview, including body language, noteworthy interactions or moments, ideas about themes and connections (Kvale & Brinkmann, 2009). Reflexivity is described as critical self-reflection about oneself as a researcher that is about one's biases, preferences and preconceptions as well as the researcher's relation with the respondent and how this might affect the answers of the participants (Korstjens & Moser, 2017). Researchers can document their thoughts about potential biases, first impressions, relevant contextual information, and outside forces that could have impacted the interview, or even the flow of the interview (Braun & Clarke, 2022). In the data analysis, the written documents which mention whether or not the participant seemed able to share or connect with the researcher, or any challenges that occurred within the interview, provide additional insight (Kvale & Brinkmann, 2009).

The researcher is a female medical doctor by profession and was pursuing a master's degree in public health nutrition at the time of the study. This background knowledge enabled the researcher to understand the participants' responses and perspectives within the appropriate context during the research. To minimize bias, the researcher tried to acknowledge and address any preconceived notions by maintaining transparency and reflexivity throughout the process. During the interviews, the researcher played the role of a listener, allowing the students and teachers to freely express their perspectives without influencing them to agree or disagree with others' ideas. Although the researcher did not have prior experience in qualitative research, relevant courses on qualitative methods were taken before conducting the study, which provided a foundation for conducting qualitative research based on acquired knowledge. The study's objectives and purposes were clearly explained to the participants through an information sheet.

Transparency, reflexivity, and bracketing are the best ways to deal with preconceptions. Bracketing is a method described by Husserl then dismissed by Martin Heidegger, comprised of

a multilayered process that is meant to access various levels of consciousness, not simply a one-time occurrence of setting preconceptions (Dowling, 2007).

4.8. Ethical issues

Researchers should be aware of ethical research practice and follow the guidelines. This includes applying for the responsible ethical committee on time. For this master's thesis, prior to commencing the study ethical clearance was sought from Norwegian center for research data (NSD) and Addis Ababa public health research and emergency directorate. The research application was submitted to the mentioned institutions and approved by the ethical review board. Further permission was also granted by specific schools. Oslo Met's internal ethical guidelines and the guidelines prepared by the research ethics committees were followed.

There are three important ethical principles in qualitative research: informed consent, confidentiality, and assessment of the consequences of participating in research projects (Israel & Hay, 2006). During the field work, the researcher kept an information sheet and approval letter. Both students and teachers read the information sheet and provided written consent before participating in the interviews. The informed consent form clearly described that only the master's student and supervisors would have access to the data material from the research project. Participation in the research was voluntary. Confidentiality was ensured by anonymizing the participants under the transcription process. Necessary precautions were taken to respect the rights, needs, values, and desires of the research participants.

5.Results

In this chapter, the study's findings will be presented based on the analysis of the focus group interviews and participant observations. First, a description of the samples included in the study is presented, followed by the results of the analysis.

5.1. Sociodemographic characteristics of the sample

The number of participants, grade, gender, and school type are presented in Table-1. A total of twelve focus group discussions were conducted, involving 51 participants. Eight focus group discussions were conducted with students (n=38), while four focus group discussions were conducted with teachers (n=13). Of the 38 student participants, 20 were male and 18 were female. In terms of school type, 21 participants were from private schools. Thirteen teachers participated in the focus group discussions, with only one female teacher. Seven of the teachers were from private schools, while the remaining teachers were from governmental schools.

Table -1 *Focus group interview: grade, gender, number of participants in government and private schools in Addis Ababa, Ethiopia.* (N=51)

Students (N=38)	Interview	Number of participants	Grade	Gender	School type	Assistant moderator
	1	4	11th	Female	Governmental	Yes
	2	4	11th	Male	Governmental	Yes
	3	6	11th ,12th	Female	Private	Yes
	4	4	11th,12th	Male	Private	Yes
	5	4	12th	Female	Private	Yes
	6	7	12th	Male	Private	Yes
	7	5	12th	Male	Governmental	No
	8	4	12th	Female	Governmental	No
Teachers (N=13)	9	3	-	2 males 1 female	Governmental	No
	10	4	-	Male	Private	No
	11	3	-	Male	Private	Yes
	12	3	-	Male	Governmental	No

Note. This table provides information on the number of participants in focus group discussions, their respective genders and grades, the type of school attended by participants, and whether an assistant moderator was present during the interview or not.

5.2. The current food habits.

Regarding the frequency of meals in a day, students typically consumed three to four meals. The types of food consumed in each meal may vary depending on the school type and whether it was fasting period.

> For results from interviews, citations are set in italics. Additional information that is included to enhance sentence meaning is written in brackets and omitted content from the sentence is indicated by dots. Words in the Amharic language are written within quotation marks.

Breakfast

Bread, eggs and 'fir-fir' (food made from shredded 'injera' mixed with sauce) were the foods most frequently consumed by the students for breakfast. A variety of foods like penne, spaghetti, 'kinche' (cereal made from either barley, wheat, or oat), rice, sandwich, sweets and 'beso' (flour of roasted barley which can be prepared either as food or drink) were commonly mentioned as a breakfast meal by the private school students:

if I do eat breakfast, it's either bread or cereal ('kinche') or 'fir-fir'……. like that, it's just habit, it's what is served and it's what we eat, and that's why. We drink tea and water. (Girl, PS, FG4)

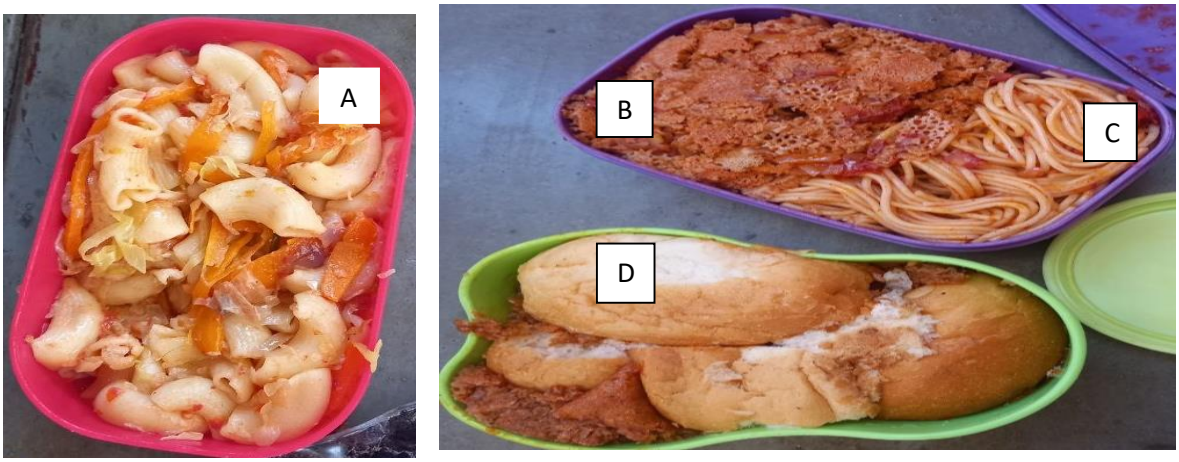

Figure 3

(A) Penne, (B) 'Fir-fir', (C) Spaghetti, (D) Bread

Note. Photos of students' lunchboxes taken at schools depict the foods mentioned by students as breakfast meals. By master's student

Another student from private school mentioned:

It's the same as everyone else has said, there's not much difference, but in general, I usually eat sweet things that are high in carbohydrates and that build the body (Girl, PS, FG6)

Lunch and dinner

The types of food eaten for lunch and dinner were mostly similar. Most students mentioned 'Injera' with various types of stew as a lunch dish. Water, tea, milk, and soft drinks were the commonly consumed drinks mentioned by the students. A student from government school described the food for lunch:

……. for lunch, normal 'Shiro' (a type of stew made from legumes), lentils, potatoes by changing one with another and rice like that. (Boy, GS, FG7)

Meat and dairy products were consumed by some of the private school students during non-fasting periods. Interestingly fruit and vegetables were mentioned as a dinner meal only by two students. For example, one student mentioned:

When I'm not fasting, I eat sandwiches for breakfast and for lunch meat-based fatty foods; for dinner there are simple carbohydrate-rich foods, right? with salad or fruits and vegetables, it is like this most of the time. During most of the fasting period, breakfast is 'fir-fir'; for lunch it is Lentil stew and the like, any non-meat dishes; for dinner penne, spaghetti. (Girl, PS, FG6)

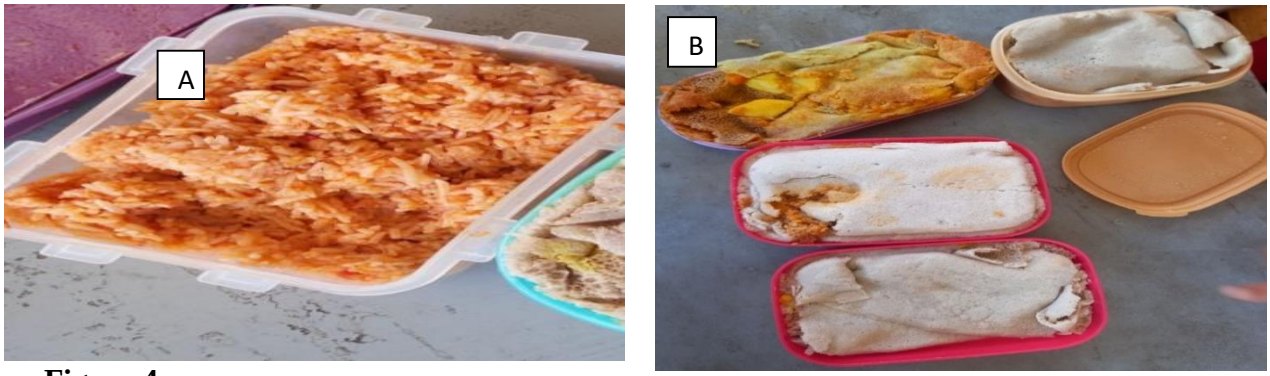

Figure 4

(A) Rice, (B) 'Injera'

Note. Photos of students' lunchboxes taken at schools depict the foods mentioned by students as breakfast meals. By master's student

Teachers noticed that most of the students consumed different types of sweet foods, as well as pasta, ‘ertb’ (a sandwich made with potatoes), ‘injera’ with stew, and ‘fır-fır’. Soft drinks, tea, water, and coffee were the most consumed drinks within the school compound. In one private school, soft drinks were banned, so the students could not consume them within the school premises. The teacher described it as follows:

In our school, each student brings his own food, mostly ‘injera’ made from ‘teff’; ‘fir-fir’; spaghetti, penne. Also, when we say balanced food, it should contain vegetables and fruits, every day from Monday to Friday, they bring these three foods that I mentioned earlier. Then use bottled water, they buy bottled water from school: the school provides bottled water. There is even purified water, which is treated every three or two months. They drink that water; So, in general it looks like this. Any other drink such as Coca-Cola; Miranda; Pepsi; Ambo is not allowed in the school compound. (Teacher, PS, FG10)

There were students who had nothing to eat, particularly in a governmental school. The teacher described it as:

In fact, I think some of them don't bring food, there are occasions when they go around and share food from their friends. There are some who come to school without eating any food, so they simply drink water in the school not to fall (from lack of energy) or not to have bad mouth odor. I observed that there are children who spend their days drinking only water. (Teacher, Governmental school, FG9)

During the observation done by the master’s student, students at the school exhibited a variety of eating habits during the break where the students eat breakfast and lunch times. Some students brought food from home, while others purchased food from the school cafeteria. There were no significant differences observed in the types of food consumed during these times. During the break, students often bought snacks such as donuts, ‘bombolinos’ (a type of wheat flour snack), ‘ertb’, ‘koker’ (snacks made from wheat flour), french fries, biscuits, and lollipops, which they typically consumed with tea.

Interestingly, one governmental school showed a higher consumption of coffee compared to the other schools. In this school, some students opted to buy food from the cafeteria instead of bringing it from home, while others skipped lunch altogether. In one private school, although

there was no cafeteria on the premises, there was a shop that sold fast food and soft drinks. Additionally, it was observed that students preferred to share their food with their friends rather than eating alone, whether it was food brought from home or purchased from the school cafeteria. When buying food from the cafeteria, they would collectively share the cost, and when it came to food brought from home, they would mix and eat together.

Figure 5 illustrates the foods brought by students from home in the governmental schools, including spaghetti, penne, injera with stew, rice, and fir-fir. The pictures were taken during lunchtime at the governmental schools.

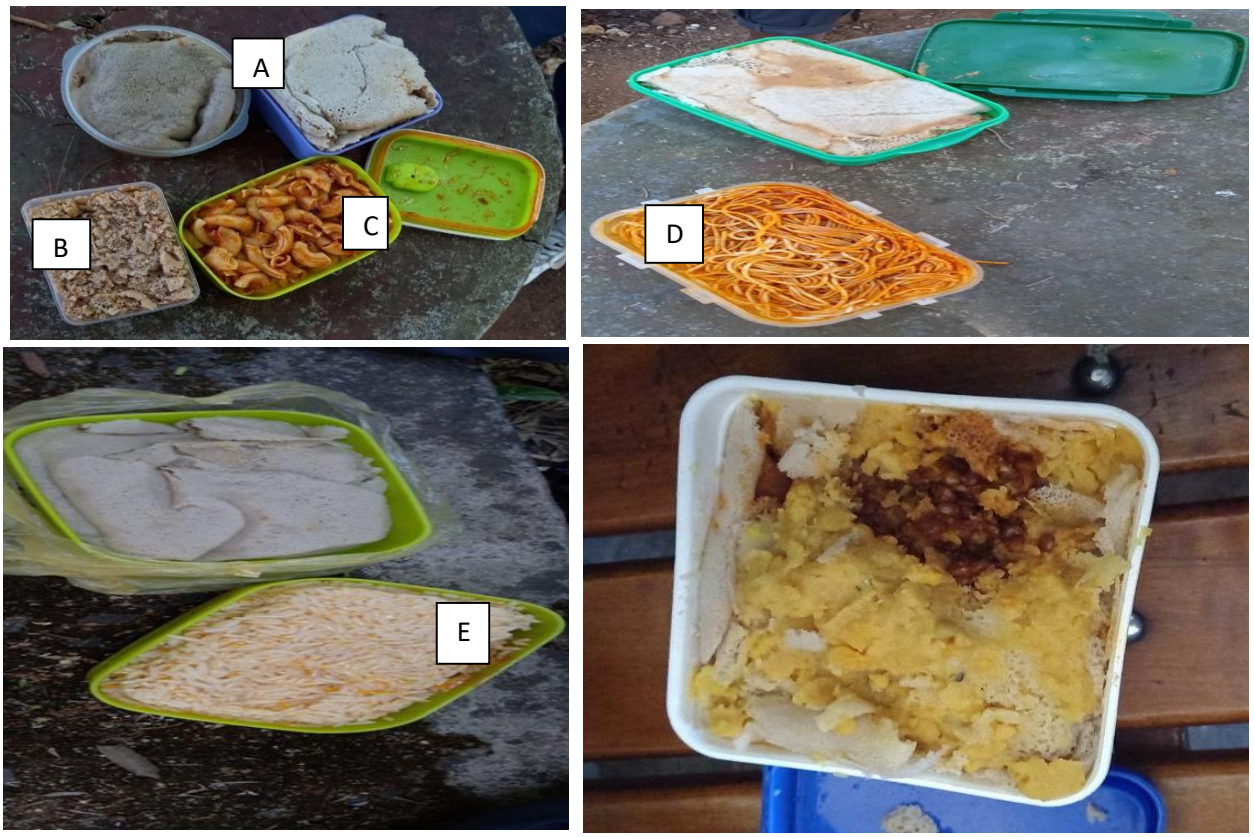

Figure 5

(A) 'Injera', (B) 'Fir-fir', (C) Penne, (D) Spaghetti, (E) Rice

Figure 6 illustrates the different types of food items prepared within the school cafeteria of government schools. As it is observed during the study "Koker," "Tekorach" (a type of soft cake), and donuts were mostly consumed food items. Injera with various types of stew, known as "Beyaynet" in Amharic, was a common lunch dish, while tea was the most consumed drink among the students.

Figure 6

(A) 'Koker', (B) 'Tekorach', (C) Tea, (D) Coffee, (E) Donut, (F) 'Beyaynet'

Figure 7 shows the foods consumed by students during break and lunchtime in private schools, including injera with stews made from potatoes, penne, and spaghetti which they brought from home.

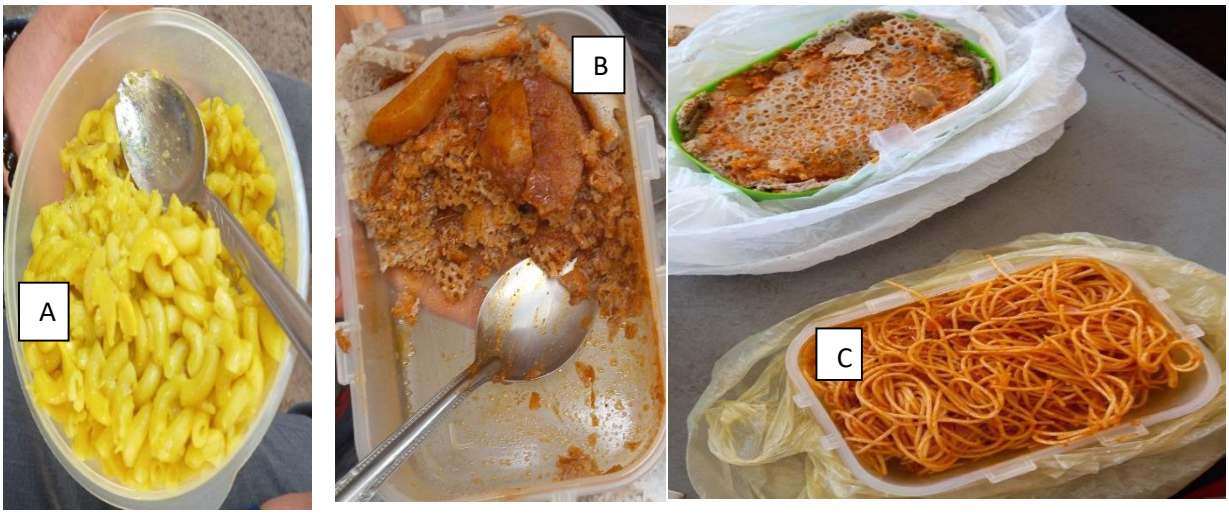

Figure 7

(A) Penne, (B) 'Injera', (C) Sphagetti

Figure 8 illustrates the foods mostly consumed by private school students during break and lunchtime, including samosas, ertb (a type of snack), and donuts.

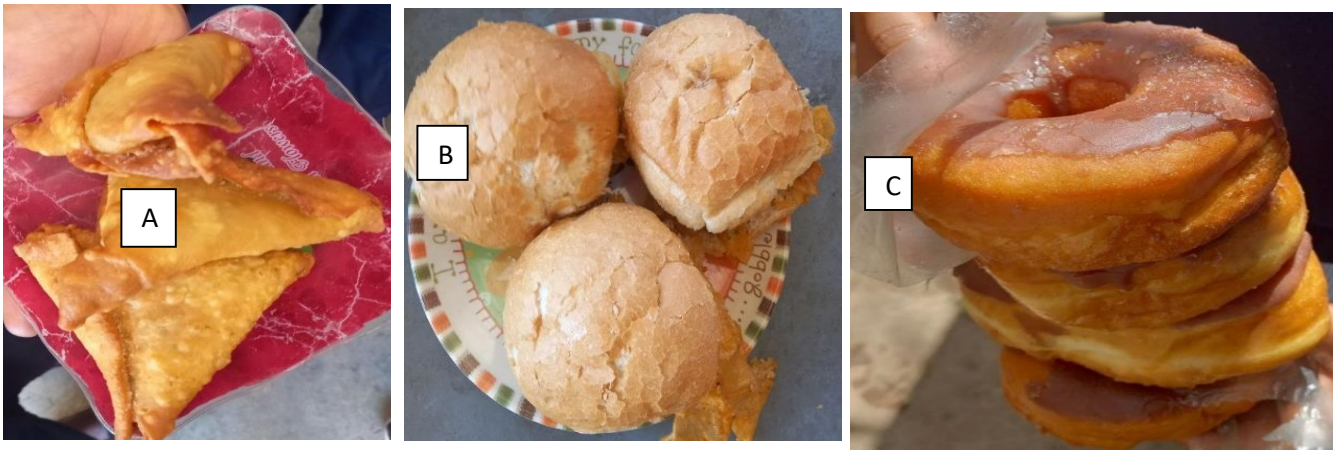

Figure 8

(A) 'Samosa', (B) 'Ertb', (C) Donut

5.3. Adolescents' perception of healthy and unhealthy diets

Adolescents in the focus groups perceived healthy diet in different ways. Fruits and vegetables, organic foods and homemade foods were mentioned as examples of healthy foods while inorganic foods, fast food, meat, packed foods, and alcoholic drinks were stated as unhealthy foods.

5.3.1. What does a healthy diet mean?

The students were asked to describe what a healthy diet means to them. Most students mentioned concepts such as moderation and balance, as well as eating nutrient-dense foods. A healthy diet was defined as:

A healthy diet means a balanced diet, just nutritious food, not eating the same food every day, just getting different types of food such as protein, vitamins, etc. on different days means a healthy diet. (Boy, PS, FG5)

Some private school students viewed a healthy diet as consumption of food that is suitable for the body:

For me, what I call a healthy diet is when we eat what suits one's own body, (the food) which one person likes, another person might not like, when we eat by choosing which works for us. (Girl, GS, FG8)

In the governmental school, some students defined a healthy diet as consuming clean food, while others mentioned the importance of eating on time. There are also others who defined a healthy diet as an energy providing diet:

It's good when we eat energy-giving food, we eat what we get but it is good if we try to eat by classifying food as energy giving and so on, I think for me, healthy diet means to eat selectively that gives energy. (Girl, GS, FG8)

Four private school students considered a healthy diet as one that includes foods beneficial for disease prevention. Interestingly, some students also perceived a healthy diet as aligning with their blood type and activity level:

If it is suitable for our blood type and suitable for our health, if it does not harm our health, we can eat all kinds of food, this is a healthy diet. (Girl, PS, FG6)

5.3.2. Perceptions about the healthiness of adolescent's diets

Most participants considered their current diet to be unhealthy, although two participants described having healthy dietary habits. Some teachers regarded the students' diet as healthy, especially when it involved home-cooked meals. However, seven teachers from various schools perceived the students' dietary habits as unhealthy, citing reasons such as the consumption of unclean foods, limited variety, and reliance on processed foods. One teacher from a private school provided the following description of the dietary practices:

Even outside the school they eat unclean food. In fact, as a private student, students from private schools often prefer better things that is what I know when I work elsewhere, but here, they like a slightly different diet, I don't know why (Teacher, PS, FG10)

One teacher mentioned the difference in dietary practices based on socioeconomic status as follows:

From the point of view of our school, you can divide their eating habits in three ways. There are some who come from families with good socioeconomic status and are properly cared for. They bring food which has variety, and which is prepared appropriately. There are some who didn't bring food, but they bring money so that they can buy food in the school……., they often buy candy or biscuits and eat that, and then there are those who don't have anything else to eat. Therefore, most of the children who come to us are those who are not able to afford it. If they are the children of the rich, they study in private schools. As I said earlier, as I tried to explain, they come with better food, and they come with money if they were from high socio-economic status families. They buy and use a student cafe in the school. (Teacher, GS, FG9)

5.3.3. Sources of information

Most of the study participants mentioned family, google, and social media as sources of information for making dietary choices. A governmental school student described:

I think that the first source is the family. When the first child is born, people come and tell do this and do this. It is from them that we can get the first source. I think they are the source. (Boy, GS, FG7)

Another student from private school stated her source of information as:

Thanks to modern technology, information can be found on many technology websites. Beyond that, there are magazines. (Girl, PS, FG6)

Broadcast media, such as TV and radio, friends, health professionals, and society, were also mentioned as potential sources of information. Four students stated that they did not have a specific information source and did not inquire about the food before consuming it. Schools and reading books were also mentioned by the students as sources of information. Additionally, one student highlighted previous experiences with food as an influential source of information:

For me, If I didn't try a food now, that is not healthy, or it is from my own experience (laughter). If I have tried it before, and if I became sick, I think it is not healthy (laughter), If I tried it and turns out to be good, it means I will continue using it. (Boy, PS, FG4)

5.4. Factors affecting adolescents' dietary habits.

5.4.1. Intrapersonal factors

The motivation for adopting a healthy diet was highlighted as being driven by the desire to sculpt one's body towards a desired self-image while also promoting overall wellness:

The first thing that motivates me to eat a healthy diet is my future self-image. When I see that I want to be this kind of healthy person in the future, when I see whether I will eat this food in the future, just when I think about the posture that I want to attain, these are the things that motivate me. (Girl, PS, FG4)

Feeling pain was mentioned as a motivator for having a healthy diet by two students from the governmental school:

Another thing is when you feel pain, it seems it is due to lack of food which suits you. When you are not having food on time, you feel you must choose. (Girl, GS, FG8)

In addition, various health benefits, such as disease prevention, boosting the immune system, and a longer lifespan, were cited as reasons for choosing a healthy diet and living a healthy life:

One (the benefit) is that it will increase our longevity. Ethiopia's people will die before they reach that age. If they eat a healthy diet, if they manage it properly from their childhood, they

will live longer, it means if there are no accidents in life. When we continue, it will help us to prevent disease. Now, when we are sick, (they say) this is necessary, drink this, eat this, etc. We will take care. And if we do that now, we will not be exposed to the disease from the beginning. Because it is possible to say eat this and this so that you don't get this disease. (Boy, GS, FG7)

The private school students tried to link a healthy diet with confidence, which is good for the brain and gaining knowledge. Two female students extended the benefits of healthy diet to pregnancy and childbirth:

Healthy means that if she eats healthy, any woman will have more strength than anyone else, and no matter when she gives birth, whether she is pregnant, she will not suffer. If she has a healthy diet, even the bleeding during delivery might not affect her. (Girl, GS. FG2)

One student from a private school mentioned carelessness, which means not giving enough attention to food, as one difficulty in practicing a healthy diet. On the other hand, barriers such as lack of knowledge, time constraints, certain types of diseases, and personal preference towards a specific food were also mentioned. One private school student mentioned his personal preference as a barrier:

For example, the thing that can be a challenge for me is a food that I like, for example, now burger is a food that I like but when it is consumed repeatedly, it is harmful to me, and it can cause a lot of fat. When the thing that I like can be harmful. (Boy, PS, FG3)

The food habits were also mentioned as reasons for consuming certain types of foods. Private school students mentioned difficulty to persuade oneself to get rid of a habit as another factor. For instance, one student said:

I think it is a habit because we have seen it since childhood. A child will do what he saw being done, right? It is what we have seen our brothers, our father and mother do. That is what we are being told, that is what is being served and that is what we are eating. (Boy, PS, FG3)

Most participants noted a change in their dietary habits compared to what they used to eat a few years ago, which was considered to affect their dietary choices. A shift in their food preferences, due to the increased freedom to choose what they eat is stated as:

It has changed. To tell the truth, in the past, families used to choose for you. I mean, in the past, as a family, they took it as an obligation. They say, we must give (our child) this (food). But now you even go to your house and eat what you find…… It will be there, but most of it is not as it is chosen for you, but as you chose it. But in the old days It is chosen for you, and they prepare it by saying, it is better if it is like this and in such ways. It is not like that now. (Boy, GS, FG7)

Adolescents reported changes in food portion size as another aspect of their dietary habits. In addition, changes in the content of food and frequency of meals were also mentioned. One student described the change in food content as follows:

Now we eat different things than before, because we grew up, for example, we could eat samosa, chips, etc. (Boy, GS, FG1)

Teachers from both governmental and private schools mentioned lack of awareness and understanding both at student and parental level as an obstacle to practicing healthier dietary habits:

……. Sometimes we feel that only expensive things are important. Especially now, the effort made not to take things that are not needed for the body is less. It is our understanding. As it is said earlier, in the house where people think that eating foods from supermarket is a sign of modernity, they don't use foods that can be prepared easily at home which are useful to the body. They think that they will use what they find since they afford to pay, and the manufacturers do not offer what is useful rather they offer what is sweet and which may have unnecessary additives that the person who consume may have an impact on one's body and they don't understand this. They take as long as they can pay. I think that's the mistake. (Teacher, PS, FG11)

The preference to eat food outside home together with friends associated with laziness to prepare foods were also mentioned as barriers. One teacher from a government school stated that students working to support their family could also be considered as a barrier which might make them not take care of their diet, which was explained as:

…….there are those that support their families unfairly, for example, they try to help their families by doing different jobs; carrying different things, selling different types of secondhand

clothing, this might create pressure when they come here, it makes them not take care of themselves, it also prevents them from practicing a healthy diet and these reasons expose them to this kind of situation.(Teacher, GS, FG9)

5.4.2. Interpersonal factors

Most adolescent students considered family as a motivator of healthy diet by encouraging and giving advice on dietary choices. On the other hand, the familial economy was the most cited barrier to healthier dietary choices cited predominantly by government school students which results in unaffordability of the healthier dietary options. Students noted that lower economic status was the reason for not being able to afford healthier food options:

It means the inequality of income and expenditure; What comes in and what goes out are not the same. What we spend to eat a balanced diet which means what we want to buy is expensive, but the income is less. (Boy, GS, FG1)

Most students stated their food habits changed while spending time with their friends. Peer pressure was mentioned as both a motivator and a barrier to a healthy diet. For example:

There are many downsides which are barriers. Too often it's my friends who are my problem not to have a healthy life. My friends eat what they get, and I become just like them. We also make plans to eat those kinds of foods. (Girl, PS, FG4)

Burger, Pizza, cake, Ice-cream, 'ertb' and soft drinks were listed as the most common food choices while spending time with friends:

Because we find 'injera' at home, there are very few people who go out and eat 'injera' because it is found in everyone's home. We eat burgers, pizza, or ice cream, (Girl, PS, FG4)

The food choice change while eating with friends was emphasized as:

It's (it has been said), when one is at home and when one goes out, it is different with your friends. What you get when you are at home…… for example, when it is a school, the food in every house is different. Since our economy is different, we can eat different kinds of food. We can eat (outside home) what we don't have at home or what we can't find quickly. (Girl, GS, FG8)

Interestingly, one student from a governmental school mentioned that sharing food with friends at school made it easier to practice a healthy diet:

The easiness (of having a healthy diet) is more than the difficulty, because now we don't get that nutritious food by ourselves or the family. If we are in school, we will have different friends. Our friends may be better than us so we can have a balanced diet together. (Boy, GS, FG1)

There were students who mentioned healthcare professionals as motivators as they teach about the benefits of a healthy diet. Other students stated that they were motivated by obese individuals, mentioning that it reminded them to eat a healthy diet not to become obese, and to avoid the bullying commonly experienced by obese individuals. In contrast some private school students mentioned being motivated by fit individuals to consume a healthy diet:

What motivates me is when I see people on social media who are very fit people, when I see people who do exercise at gym, immediately we check their page, healthy life, about their dietary habit, whatever when I see these things I decide (Girl, PS, FG4)

Teachers mentioned the lack of appropriate parental care as an obstacle for students to practice a healthy diet. Additionally, governmental schoolteachers emphasized the low familial income level, which was also identified by the students as a barrier to making healthy dietary choices. One teacher described the economic issue as follows:

One of the things that can prevent people from having a healthy diet, as it is being said, is the economy. It is because of the low income of the parents; let alone balanced food, there are those who do not bring food to eat. That is a problem. Again, even those who bring balanced food; It is only the name, it has limitations on how much they can eat and the amount to eat from the different types. The main thing that makes them not eat balanced food is having low family income. (Teacher, GS, FG12)

Peer pressure was also mentioned as a barrier to a healthy diet by the teachers. A private school teacher explained it as:

Now, for example, if the lunch and breakfast that the children have is different from that of another friend. For example, when we stay at school, they leave without eating or they may

throw it in the basket. If they start saying they don't want to take (the food) when it is put in the lunch box at home, it might be due to the food that their friend brings. (Teacher, PS, FG11)

5.4.3. Organizational factors

Two students from the governmental schools mentioned that less emphasis is placed on nutrition in the educational system, which they see as a factor influencing their dietary choices. Other students mentioned unavailability as a reason that makes it difficult to maintain a healthy diet. The lack of healthy food options and the abundance of nearby street foods can be seen as obstacles. One student from a private school mentioned the unavailability of healthy food in the school environment as follows:

Now, for example, when we go out of school, there is no place where we can eat good food. Now here, as he says, there is only chips and the like (Boy, PS, FG5)

Unavailability of healthy diet at home was described by a private school student as:

It is difficult. I mean that since I am not a provider for the house currently, If I say more salad in the house or as it should be If I say I have to it healthy diet. I don't eat at all, No one can provide this for me. We eat what is served; we don't have an option. For example, if there are two different dishes. Either you eat both or you can eat one of them. I can't say I can't eat or eat something else…….. (Girl, PS, FG 4)

Some private school students found it easy to maintain a healthy diet. They mentioned that accessing healthy foods was convenient, which facilitated their ability to adhere to a healthy diet:

If it's for me, it is healthy and we can get what we want, but if we think like most people, it's not healthy. Everyone there is who doesn't get, who doesn't eat one time just that is not healthy if it is mine, it is healthy, I can get what I want.it is like that. (Boy, PS, FG5)

A student from a private school mentioned that the unappetizing coldness of the food in the lunch box as barrier to eating a healthy diet at school level. Additionally, another barrier cited was food safety; for instance, the risk of consuming expired foods when they buy packed foods from shops was mentioned as a hindrance to making healthier food choices:

For example, things that prevent us from having a healthy diet, such as expired foods, may not be healthy when we use them. (Girl, GS, FG2)

Advertising was stated to motivate most adolescents to buy what is being advertised. Some students mentioned that advertisements make them eager as it is interesting. For example:

……..as everyone has said, it has more effect, because like now in this country in Addis Ababa, when it is called Chicken Hut, we saw it in an advertisement before we went in person, right? Then we decide to go and eat, even if you see on the menu, we choose food based on how it looks on the picture. we kind of say this is pretty stuff. Advertisements have an impact. (Girl, PS, FG6)

Those who mentioned advertisements as not influencing their dietary choices were just as many as those who were motivated by them. There were also others who considered advertisements to be just a source of information about the product. Interestingly, three students stated that the community had a low acceptance of advertisements.

Teachers from different schools emphasized the unavailability of healthy food options and advertisement in the school food environment as possible obstacles for students' food choice. The school food environment in private school was described by one teacher as:

There are shops opened around the school, there are things to be sold, it is student-centered not from the point of view of health, but the merchant does it from the point of view of income, so the sweet things are sold very much. The frequency, even if it is a good thing when it is eaten repeatedly, the healthiness of the food is reduced. So sweet things are sold in high amounts near the school. I think that it has more impact. Even if students try hard at home, the things they find outside will have an impact on their health. (Teacher, PS, FG11)

Observation to the school food environment by the master's student revealed possible barriers to practicing healthy dietary options in most of the schools. Fruits and vegetables were found nearby only in one of the four schools while in the remaining schools, fast foods, soft drinks, and sweets were mainly available and placed in attractive ways to catch the eyes of the students.

Figure 9

Food environment of governmental school

Figure 10

Food environment of private schools

5.4.4. Community factors

The community's attitude towards dietary practice and food habits were factors that affect the students' dietary choices. Private school students described the community's attitude as:

But what prevents me from eating often is that it is common in our society that everyone eats what they have. If you say No, I don't eat I am on diet. People make fun of you, and you look like a pick me, and since we were kids, we've been told to eat what we got at home, so that's what we grew up eating, so we still don't choose what we eat (Girl, PS, FG4)

Interestingly, one student from a governmental school raised the lack of a birth limit which leads to increased number of children in the household as a possible obstacle to healthy dietary practices by affecting the economic situation of the family:

It is my opinion that people do not have a birth limit. Now, for example, how can one have six children in the house, and provide them with a balanced diet. Without being able to manage, it is better if one does not have children or not to marry someone else. (Boy, GS, FG1)

5.4.5 Macro level factors

The cost of living, which can be related to income level and affordability, was mentioned as a barrier to a healthy dietary choice. One private school student described the cost of living as:

If we look at the foreigners, they can get a lot with less money. For lunch, they can eat whatever, like a burger if they want for four dollars. Like, there are discounts, like eating the whole day for ten dollars, and with ten birrs here let alone the whole day there is no chips, chips are not even ten birrs, it is fifteen birrs. Therefore, it means that if a person if it is like the countries abroad, a person can choose what he wants, he will eat what is healthy, but if it is like this, he eats what he gets, there is also who doesn't eat so (Boy, PS, FG5)

Teachers observed changes in the food preparation methods. They explained that previously, ingredients, especially spices, were prepared at home, whereas now they are being bought from the market. The changes in the production towards more processed foods were explained as:

……. diet has changed a lot now. Natural things are disappearing, more and more things are processed in factories. So, when something goes in and out of a factory, there are different ingredients that are added. It's not those ingredients. Even when you take medicine it has its own side effects. There is an effect caused by the added ingredients, chemicals, so they are unnatural. Every time while eating unnatural things, you may encounter many students with inappropriate body weight. In the past days even if (there is) a problem of not having enough income, A person can get milk easily, natural milk, for example, there is milk that is given by cows that eat grass,

and now there is a diet that cattle eat, which has its own contribution to the result. Most of the time we see processed things. For example, even when we get milk the butter is already removed from it and it has its own thing, we lose what we must get when it comes out from the factory. I think that our diet has changed in many ways. (Teacher, PS, FG11)

Other teachers mentioned political instability and internal migration as possible obstacles for students to practice a healthy diet:

There are also some who migrate from other regions of the country due to political instability There are (students) who live with relatives, and when you see those children, when you teach them, they might attend actively the first and the second periods until the break. After that, they don't want to stay, or they might sit in the sun. They say that they are cold and hungry……. (Teacher, GS, FG9)

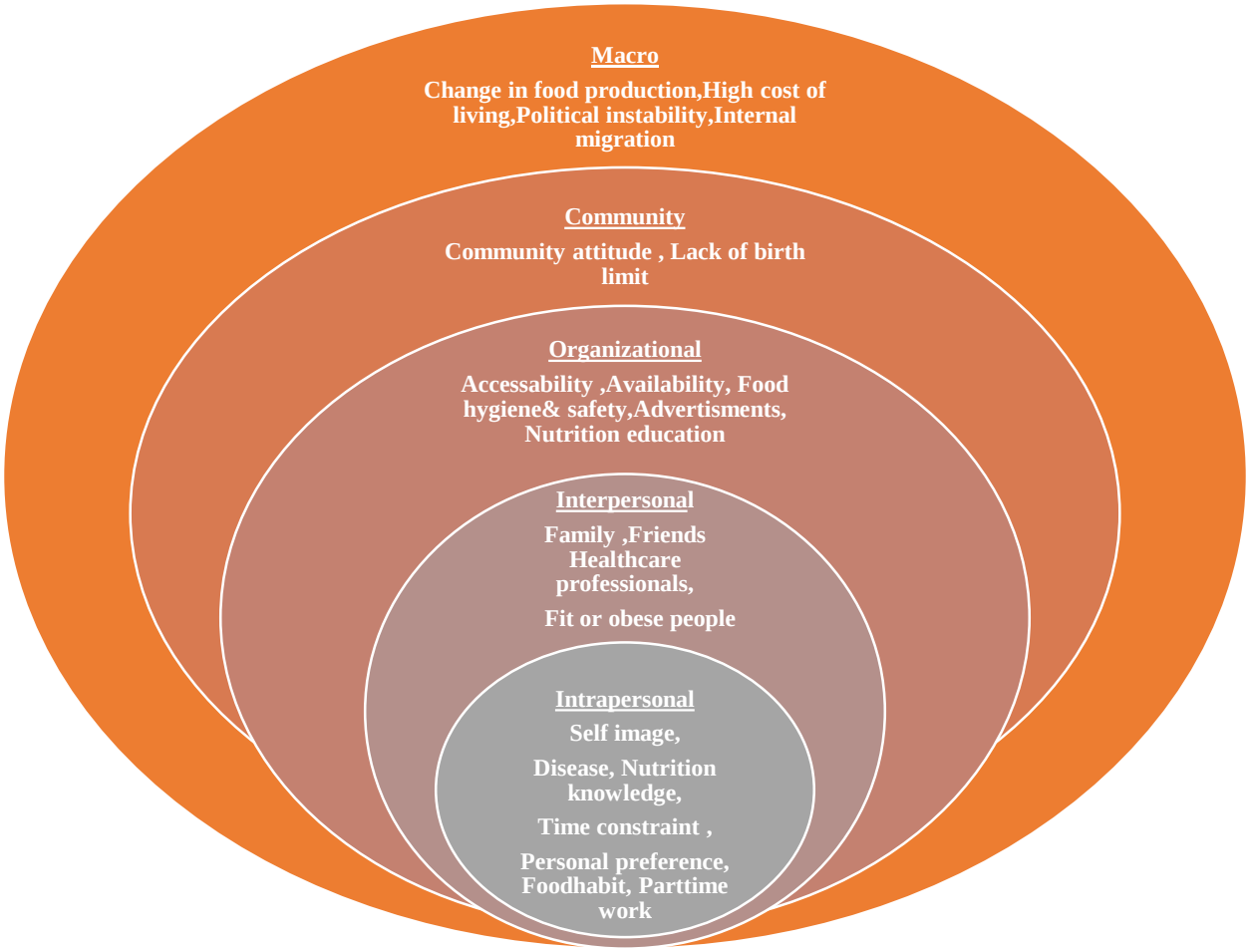

Figure 11

Factors influencing dietary habits among adolescents in Addis Ababa using the socioecological model.(Bronfenbrenner, 2005)

Note. This model was produced by Bronfenbrenner in 1970's identifying individuals affect and are affected by a complex range of social influences and nested environmental interactions. From "Socio-Ecological Model of Correlates of Double Burden of Malnutrition in Developing Countries" (Mahmudiono et al., 2019).

5.5. Possible solutions to improve unhealthy dietary practices.

Raising awareness was listed as one method of improving the dietary choices of the students. This could be accomplished by integrating nutrition courses with formal education, providing training, or developing motivational messages:

Just like they said, awareness is the biggest thing. for example, in my home, meat is a luxury life. I don't think it's just us, I think it's for many people. Eating meat, getting anything, especially eating things related to animal products, is considered as a luxury life and why is it like that? I don't know. There is something assigned for meat. There is a name assigned to both, I don't know why, but I know that since I was a child, and that is what my mother knows, and the ones before are like that as well, so I think it would be right if it is worked on creating awareness (Girl, PS, FG4)

Governmental school students mentioned that healthy food options should be made available, and they highlighted the establishment of a school feeding program as a supportive measure, citing an example of one that is already practiced in primary schools. Working to correct the current economic situation of the country was another solution that was considered by the students:

The first thing that should be done is that what is offered to us should be affordable or If the supply is more, and the purchase price is lower, and if it is accessible to all, it would be great as a country and as an individual. (Boy, GS, FG1)

Sharing food was also stated as a possible solution by private school students:

That is the problem of the country; You can't change the fact. Even if he doesn't have a healthy diet, we can at least make him eat daily. Personally, if we share what we have, it will be easy. (Boy, PS, FG5)

Students had to repeatedly practice healthy dietary patterns to make them a habit. One private school student considered taking the barriers of a healthy diet as a possible source of encouragement:

I say it is easy and hard for me. It is up to us to decide. We can make it easy when we can convince ourselves, and (it is) hard when we can't convince ourselves and act accordingly. So, if we can convince ourselves, I believe it is very easy, there is nothing we can't do. Every time we see our obstacles. I think that anything that we think difficult will be easy if we can think of our obstacles as encouragement and not as obstacles. (Girl, PS, FG 6)

Most teachers mentioned increasing awareness as a possible solution to improve the current dietary practices of the students. Integrating nutrition lessons into the school curriculum was considered as one way to increase knowledge about foods and how to prepare healthy diets based on the income level. The teachers emphasized that nutrition training and sessions should not be limited to students alone but should also involve their families. This would enable parents to control their children's dietary habits based on knowledge. A private school teacher described about nutrition education as:

Health experts in the Ministry of Health should raise awareness in schools at different times, not only giving (nutrition education) once and run away, but also (doing it) at different times, awareness of the nutritional status, the benefits of nutrition, how to prevent disease, how to fight disease..... (Teacher, PS, FG 10)

Both governmental and private school teachers agreed on making the school food environment healthy for the students. Urban agriculture and farm to school programs were also considered for addressing the issue of availability. The school meal program was another way of providing healthy meals mentioned by three governmental schoolteachers:

The second option is that our school is large and if there is a feeding program, one can plant vegetables in the school compound which can provide (balanced) food that might adjust the dietary habit. Second, it's possible to buy cows in our school and to provide milk for the students, it is also possible to breed chickens as we have a large yard in the school compound. (Teacher, GS, FG 9)

Reducing the workload on the children and working hard to improve the economic situation could help to alleviate the problem. Interestingly one teacher from a private school raised reconciliation of the current and past dietary habits as an important working point:

Yes, I think it is to reconcile the two. Now it is to reconcile the diet of this era and the diet of the past. Sometimes there are times when children guide, for example, I have valid knowledge about nutrition, but if I listen to my child, there is a child's need and an adult's knowledge, and work must be done to reconcile the two. (Teacher, PS, FG11)

Dietary rules and regulations were also mentioned as important measures to improve current dietary habits:

A knowledge-based solution is needed; a general guide is needed; a food safety guide; Advertising guide is required. If you have seen it now, on the advertisement they eat a biscuit and do acrobats something, so if you say to your child, don't eat it (that biscuit) what he sees and hears will be different.so advertisement law is needed. The law says about the safety and quality of manufactured products, but it is not implemented, or the executive body does not do that. (Teacher, PS, FG11)

In general, collaboration among all responsible stakeholders, including health professionals, non-governmental organizations, investors, and the agriculture sector was proposed as a solution to improve students' diets. Private school teachers suggested the holistic change should involve students and the consumers at the individual level:

I don't expect from the top, from what every individual, students, everyone should save themselves, but everyone will grow together to work like from the top when the politics improves; when agriculture improves otherwise There is no place for nutrition to shine and be improved. because these are related things…….. (Teacher, PS, FG 11)

6.Discussion

In this chapter, the findings regarding the perception and factors affecting dietary habits among adolescents are discussed. The discussion is structured around the socioecological model, which recognizes the complexity and multi-level nature of dietary behavior and its determinants. Bandura's social cognitive theory, which emphasizes the reciprocal interactions between personal, behavioral, and environmental factors, is integrated into this framework to provide a more comprehensive understanding of the factors that influence healthy dietary choices specifically among adolescents. This is followed by a discussion of the methods used, trustworthiness, strengths, and limitations of the study.

6.1. Discussion of results

This study was conducted to explore perception of a healthy diet among adolescents in Addis Ababa, Ethiopia. The perception of a healthy diet was examined in private and governmental schools. The teachers' perceptions towards the adolescents' diet were also explored. The findings of this research provide insight on factors influencing healthy dietary choices among adolescents which will help to design interventions for improving their dietary habits.

Intrapersonal factors

In this study most students perceived a healthy diet as eating balanced meals including food items from the different food groups. This perception aligns with previous studies (Tiedje et al., 2014; Correa et al., 2017) as well as the definition of healthy diet provided by the WHO (World Health Organization (WHO), 2020) and the recommendations outlined in dietary guidelines (Dietary Guidelines for Americans [DGA], 2020; Ethiopian Food Based Dietary Guidelines [EFBDG], 2022). Students recognized the importance of disease prevention, nutrient adequacy, and not harming health in relation to a healthy diet, which aligns with the definition of a healthy diet outlined by the United Nations Food Summit (Neufeld et al., 2023). However, both teachers and students have identified a lack of knowledge and awareness as a barrier to making healthy dietary choices. This indicates the need for nutrition education to further enhance their understanding of the specific components and dietary composition of a healthy diet.

There was a distinction in the perception of a healthy diet between governmental and private school students. Governmental school students placed emphasis on food safety, perceiving a

healthy diet as consuming clean food. This emphasis may be attributed to the poor hygiene of the school dining area and the students' living conditions. Similarly, in another study conducted among Ethiopian adolescents, food safety such as food cleanliness and hygiene were also identified as a factor influencing dietary behavior (Trübswasser et al., 2021). In contrast, private school students associated a healthy diet with eating according to their blood type and activity level. The concept of eating based on blood type lacks scientific support and empirical evidence, indicating alternative and non-scientific approaches to health and nutrition (Wang et al., 2018). This finding underscores the importance of promoting evidence-based dietary recommendations and education in private schools to counter the dissemination of misinformation and foster healthy dietary habits. Nutrition literacy, which includes both obtaining and implementing nutritional knowledge, has also been found to be significantly correlated with adolescents' food habit (Taylor et al., 2019; Koca & Arkan, 2020).

In our study, the participants identified fruits, vegetables, organic foods, and homemade foods as examples of healthy foods, while inorganic and fast foods containing high fat and oil, meat, packed foods, and alcoholic drinks were identified as unhealthy foods. These findings are consistent with those reported by adolescents from various countries (Tiedje et al., 2014; Sedibe et al., 2014; Correa et al., 2017; Beck et al., 2019) and align with dietary guidelines (Dietary Guidelines for Americans [DGA], 2020; Ethiopian Food Based Dietary Guidelines [EFBDG], 2022). Despite occasionally using non-scientific justifications, such as a blood type-based diet, adolescents demonstrate the ability to distinguish between healthy and unhealthy foods. They have baseline nutritional knowledge, which can be improved through proper nutritional education. However, according to both social cognitive theory and the socio ecological model individual or personal level factors are one but not the only determinants to bring the desired dietary behavior change among adolescents (Anderson et al., 2010; Mahmudiono et al., 2019).

There was a distinction in food choices between private and governmental school students. Most private school students expressed a preference for junk foods such as burgers, pizza, cake, ice cream, and soft drinks when spending time with their friends. On the other hand, government school students mentioned a preference for foods like French fries and "ertb" which might be due to the affordable price of these options. This preference aligns with findings from other studies in lower-income countries, which indicate that households with high socioeconomic

status (SES) may have greater access and financial means to procure processed, fatty, and sugary foods and beverages (Gebrie et al., 2018). In contrast, within governmental schools, there were students who had limited food options and resorted to drinking water or purchasing candy when they felt hungry. This disparity can be explained by the social inequality in nutrition, where food distribution is uneven, and food security is influenced by factors such as patterns of socioeconomic progress of the country (D'Odorico et al., 2019).

Understanding the benefits of a healthy diet is crucial as it motivates adolescents to make healthier food choices. In this study, participants identified that a healthy diet could enhance immunity, prevent diseases, and contribute to a longer life. These findings are consistent with a study conducted among Indian adolescents (Correa et al., 2017). This study also highlighted the long-lasting effects of a healthy diet during pregnancy and childbirth. These findings underscore the importance of designing dietary interventions that align with adolescents' understanding and perceptions of healthy eating, while addressing any misconceptions and improving dietary practices. It is crucial to acknowledge that nutritional knowledge and perception are among the many factors that should be considered in these interventions.

Despite having knowledge about healthy diets, the students were not able to put it into practice. Most of them consumed meals that consisted of only one or two food groups and often consumed unclean foods from food vendors. These observations align with a previous study conducted among Ethiopian adolescents (Trübswasser et al., 2021). In our study, we noticed that vegetables were occasionally consumed by the students, while fruits were completely absent during the observation period. Teachers also acknowledged this situation and noted that students consistently brought food items that lacked vegetables and fruits, making it difficult to consider their diet as balanced. Several factors contribute to this condition, including the unavailability, lack of access and unaffordability of certain foods. These elements fall under the category of organizational factors, which influence dietary behavior. Environmental factors, including interpersonal, organizational, and community-level factors, have a significant impact on adolescents' dietary choices, as explained by Bandura's social cognitive theory (Bandura, 2004).

Skipping meals, particularly lunch, was identified as an unhealthy dietary habit prevalent among governmental schools. Students preferred to skip lunch rather than bringing lunchboxes to school. This dietary practice was primarily attributed to peer pressure, which is one of the

environmental factors influencing dietary behavior in Bandura's social cognitive theory. Students mentioned that they don't bring lunch boxes because their friends and seniors do the same thing. In another study, skipping breakfast among Ethiopian adolescents has been identified, with the inaccessibility of prepared foods in the morning cited as a common reason (Agedew et al., 2022). Additionally, a study on Brazilian adolescents has shown that skipping meals is associated with body weight perceptions, where a negative body image increases the risk of engaging in unhealthy dieting and developing disordered eating patterns (Madalosso et al., 2020). Although body perception was also mentioned as an influencing factor among our respondents' skipping meals is mainly due to lack of access and peer pressure which differs from the reasons identified among Brazilian adolescents.

Interpersonal factors

The participants of this study mentioned family, including parents and siblings, as a motivator to have a healthy diet where their support was mainly by giving advice and encouragement. This resembles the findings of other studies conducted among adolescents where perceived parental support influenced their eating behavior positively (Correa et al., 2017; Wrobleski et al., 2018; Madalosso et al., 2020). If parents focus on building a positive relationship with their children earlier in life, they have the potential to become role models who can positively influence their children's dietary habits (Mahmood et al., 2021). This is especially important during adolescence, as this age group is highly susceptible to the negative influence of those around them (Tomova et al., 2021).

Peer pressure is another factor which greatly influences the dietary habits of adolescents. In this study friends were perceived both as motivators and barriers to a healthy diet. The discussion about health and body building issues with friends was taken as an enabling factor towards healthy dietary choices which is also supported by previously conducted studies (Corkins et al., 2016; Wrobleski et al., 2018). In contrast, if peers engaged in unhealthy dietary practices, the adolescents expressed that there was a strong likelihood of being influenced by them. This has also been observed in a study conducted in a similar setting (Trübswasser et al., 2021). The fact that adolescents are highly susceptible to the influence of their immediate environment can be viewed positively. By understanding the influence of peers and family factors on adolescent eating behaviors, interventions can be tailored to target these specific factors. A peer-led

nutrition education program as well as family-based cooking classes could be effective in promoting healthy dietary behaviors among adolescents in cases where organizational level factors do not cause constraints. Additionally, peer support and modeling can be utilized to encourage healthy eating habits.

Healthcare professionals were recognized in this study as motivators for promoting healthy dietary practices. They occasionally teach and encourage students about their dietary choices, particularly in schools. Both healthcare professionals and parents can collaborate to enhance adolescents' dietary habits, acting as motivators to counteract peer pressure that may lead students towards unhealthy choices (Trübswasser, et al., 2021). Apart from family and friends, the most common sources of dietary information were Google, and various social media platforms, followed by broadcast media. Understanding this helps determine where to provide information to increase the nutrition literacy of adolescents. Given that social media is a popular source of information, it would be appropriate for health professionals to utilize the most widely used social media platforms in Ethiopia to reach adolescents. Additionally, physically fit individuals can serve as motivators and be employed as promoters of healthy diets. For instance, they can endorse healthy snacks on their social media platforms, exerting a positive influence on the dietary choices of adolescents. This helps to use the media for the promotion of healthy food choices and dietary habits rather than presenting image-related content which may lead adolescents to a higher body dissatisfaction, dieting/restricting food and overeating (Knauss et al., 2007; Rounsefell et al., 2020)

Eating away from home is a common practice stated in this study often done with friends and can contribute to unhealthy food consumption. This trend of obtaining food from sources beyond the home, including restaurants, fast-food chains, cafeterias, street vendors, and other establishments, is not limited to high-income countries but is also prevalent in Asia, Africa, Latin America, and the Caribbean. In LMICs, a significant portion of energy intake comes from ready-to-eat food sold by street vendors (Fanzo & Davis, 2021). Understanding how adolescents perceive and make dietary choices in the context of this increasing reliance on external food sources is crucial for addressing health and nutrition challenges in this population.

Another common dietary behavior observed among the students was sharing their food instead of eating alone. They believed that sharing food allowed them to balance different types of food

within the group, which they considered a way to maintain a healthy diet. They mentioned that even if they couldn't access nutritious food individually, having supportive friends made it easier to manage. Research literature supports the idea that family meals (for young individuals) and shared meals (for adults) are associated with improved dietary intake (Fulkerson et al., 2014). In this study sharing food with friends helps to eat balanced and in variety from the different food groups which was difficult for some students to practice.

Organizational factors

Food security, encompassing accessibility, affordability, and availability of food, plays a significant role in influencing dietary choices (Food and Agriculture Organization (FAO), 1996). This study identified that a lack of healthier food choices within the school food environment were obstacles to maintaining a healthy diet. Affordability was also mentioned as a barrier, which is directly linked to individuals' economic status and the cost of living. Similar findings have been observed in other studies conducted among adolescents in low- and middle-income countries (Silva et al., 2015; Correa et al., 2017; Trübswasser et al., 2021). These factors can be attributed to the broader issue of social inequality in the nutrition system, where low- and middle-income countries face challenges in achieving food security at the individual level, in contrast to more prosperous countries (D'Odorico et al., 2019; Issahaku & Alhassan, 2021)

Even if the availability and affordability issues were mentioned in all schools, it was predominantly in governmental schools where inadequate food intake was mentioned as a barrier to healthy eating habits among students. When the governmental school students mention unavailability as a factor, it might mean hunger and lack of food as was stated clearly by their teachers. Clarifying this is important because dietary initiatives like balanced and varied school feeding meals and farm to school programs can help to improve the real burden that adolescents face.

Private school teachers identified school food environments that promote excessive consumption of unhealthy food options as potential barriers to healthy eating. The study found that the school food environment was primarily characterized by fast food and other unhealthy snacks, in terms of food safety. These findings are also supported by other studies conducted on school food environment (Dia et al., 2021; Trübswasser et al., 2022). Nutritious food options were also lacking, and while fruits and vegetables were available in one of the four school food

environments, they were only sold by the kilogram, making them too expensive for most students who could not purchase them in smaller portions. This indicates that teaching about healthy diet alone cannot change the dietary behavior, but the planned intervention should relate all the personal, behavioral, and environmental factors to reach the desired outcome.

Food marketing and advertising exert a significant influence on the dietary choices of children and adolescents, particularly adolescents who are especially vulnerable to the immersive and ever-changing digital marketing landscape that promotes unhealthy food and beverage products (Kraak et al., 2016). Both students and teachers perceived advertisements as a barrier to practicing healthy dietary habits, as they encourage the purchase of advertised products. Unfortunately, these advertisements often promote unhealthy and processed foods, targeting adolescents as independent consumers (Fox & Timmer, 2020). In the 21st century, where adolescents are exposed to numerous advertisements on various social media platforms, promoting and enforcing advertising laws and regulations is crucial (World Health Organization [WHO], 2010). This can help mitigate the influence of environmental factors that lead them towards unhealthy dietary practices.

Urgent interventions are needed to improve the accessibility and affordability of healthy diets (Kaleab & Kalle, 2020). In this study, urban agriculture, farming to school and school meal program are identified as possible solutions to improve the current dietary habits of adolescents. Making the school food environment healthy can have a positive impact on dietary habits. By ensuring that healthy food options are available, affordable, and easily accessible near the school, it can encourage students to make healthier choices. This can also help in reducing the consumption of unhealthy food options, which can contribute to the development of obesity and other diet-related diseases (Correa et al., 2017; Trübswasser, et al., 2021).

Enhancing nutrition literacy and education goes beyond addressing the intrapersonal factors of the individual. It also helps strengthen healthy dietary practices by promoting nutrition knowledge within families and among peers, which were identified as significant factors influencing healthy dietary intake in this study. Furthermore, integrating nutrition education into the national education curriculum and providing it to students can reduce peer pressure towards unhealthy diets. By understanding nutrition and food, individuals with higher socioeconomic status can reevaluate the belief that pre-packaged and supermarket-sold food is the healthier

option. At the same time, individuals with lower socioeconomic status strive to learn how to prepare nutritious meals using affordable and accessible ingredients. This is supported by the recognition of food and nutrition literacy as fundamental tools to address Africa's considerable challenges, including malnutrition and food insecurity (Mohsen et al., 2022).

Community factors

Community norms can be considered a significant factor influencing dietary habits, as they can either promote or hinder adolescents' dietary practices (World Food Program [WFP], 2018). In this study, community norms are identified as a barrier for adolescents to adopt a healthy diet, as they restrict their ability to make independent dietary choices. This obstacle can be overcome by educating adolescents to resist being easily influenced by norms and instead make informed dietary decisions based on nutritional knowledge.

The absence of birth limits was identified as a barrier to maintaining a healthy diet. With a large family size, there can be a decrease in individual care and support for each child, along with an increased financial burden (Berhe et al., 2019; Handiso et al., 2021). Consequently, the autonomy of children in choosing their desired food is hindered, as they are compelled to consume what is served and available. Moreover, adolescents also mentioned a lack of autonomy in their food choices, as they are not the primary providers in the household. Improving the family's economic conditions can help address this issue and make it easier to accommodate the food choices of all family members. To effectively convey the importance of family planning to parents and supplement their nutritional education, it is crucial to emphasize the connection between family planning and nutrition.

Macrolevel factors

Food prices are closely tied to both affordability and availability, playing a significant role in shaping food consumption patterns. Price-induced dietary changes can have detrimental effects on dietary diversity and quality, increasing the risk of malnutrition and adverse health outcomes (Fanzo & Davis, 2021). The high cost of living, combined with inflation in food items, affects the problems of availability and affordability, which were identified in all schools. As a result, adolescents may be compelled to make unhealthy dietary choices despite having the requisite knowledge. Subsidizing the cost of nutritious foods and implementing higher taxes on unhealthy

options are considered as potential methods to promote the consumption of healthy diets and reduce the consumption of unhealthy food choices (Smith et al., 2018).

Both the students and teachers agreed on the change in food preferences over time where the teachers perceived a shift in students' food preferences towards processed, high-sugar, and fried foods, which contrasts with what was practiced a few years ago. The students' current dietary habits was perceived as a combination of Ethiopian traditional foods and western diet, indicating the initial phases of the nutrition transition (Fanzo & Davis, 2021). The study being conducted in an urban setting may explain the eating pattern. The fact that urbanization is related with the nutrition transition and adolescents are highly engaged in unhealthy dietary behavior which is also supported by studies conducted in different countries (Stamoulis et al., 2004; Scott et al., 2019; Vilar-Compte et al., 2021). This change can also be attributed to globalization, where adolescents are influenced by celebrities and adopt Western dietary habits. This highlights the significant scope of the problem. While it is not feasible to prevent globalization, providing necessary nutrition education can empower adolescents to maneuver in a new food environment. Additionally, the development of national food policies and regulations can help mitigate the impact of globalization on healthier dietary practices.

6.2. Discussion of methods

Trustworthiness of the study

In this last section, aspects related to trustworthiness will be discussed. Trustworthiness is used as quality criteria in qualitative research. Multiple definitions and criteria are available for evaluating trustworthiness, with credibility, transferability, dependability, and confirmability being widely recognized (Korstjens & Moser, 2017).

Credibility assesses whether the research findings accurately reflect plausible information derived from the participants' original data, ensuring a correct interpretation of their original perspectives (Korstjens & Moser, 2017). In this research, efforts were made to establish credibility through persistent field work, ensuring a match between the findings and reality. Additionally, the researcher accurately recorded the focus group discussions to obtain detailed description of the situation. Another method used to assure credibility was the persistent

observation of the data, where the researcher read and reread the data during the transcription, translation, and coding.

Triangulation is a method used to strengthen a study by combining different methods which can be done in various ways. Methodological triangulation involves using multiple methods to study a single problem or program while data triangulation refers to the use of a variety of data sources in a study (Patton, 2015). Both methodological triangulation (focus group discussion and observation) and data triangulation (focus group discussion with teachers and students) were employed to enhance the validity of this study.

Transferability is the extent to which research findings could be transferred to other settings and context (Korstjens & Moser, 2017). To ensure the transferability of the findings, rich and thick description of focus group discussion among students and teachers were provided in the study including where the research was carried out, its setting, sample, sample size, sample strategy, demographic, socio-economic, and clinical characteristics, interview procedure and topics.

In qualitative research, the term 'dependability' is closely equivalent to reliability in quantitative research (Bashir et al., 2008). Dependability refers to the stability of findings over time while confirmability is the extent to which other researchers can confirm the findings of the research study (Korstjens & Moser, 2017). To enhance the dependability and confirmability of this study, a comprehensive and rational portrayal of the study's perspective, the researcher's involvement, the informant's stance, and the location where data was gathered, the research design, data collection methods, data analysis techniques has been provided.

Consistency in data collection is another method to ensure dependability (Korstjens & Moser, 2017). The researcher improved the interviewing skills and made necessary adjustments to the interview guide after conducting a pilot study. Prior to the actual study, focus group guide and observation guide were created and tested. The translation of Amharic to English language was done using Google Translate to minimize errors during translation. The translated interviews were carefully checked to ensure that they did not include any noticeable errors before and after being transferred to NVivo. Additionally, the researcher shared the training and reflexive practices concerning interpretive procedures and coding methods to improve dependability.

Strengths and limitations of the study

This thesis aimed to explore healthy dietary practice using two different methods: focus group discussion and participant observation. The focus group discussions were conducted with both teachers and students which helped to describe dietary practice from different points of view. Additionally, observation of the school meals and the school environment were conducted. The use of triangulation, combining different data sources and forms of data collection can be considered a strength of this project.

Another strength of the study is the utilization of two different school settings: private schools, where most of the students come from high socioeconomic backgrounds, and governmental schools, which is predominantly attended by students from families with lower socioeconomic status. By including these two settings, the researcher was able to explore the influence of social inequality on dietary choice which has been identified as a theoretical factor in other settings. This is relevant because if social inequality is found to have an impact in the real world, it can aid in the planning of prevention programs and school-based interventions that hold meaning for the study participants and the community.

There are several limitations to this study. Firstly, it would have been beneficial to include quantitative data which is the best way to assess the predictors and the magnitude of unhealthy dietary practice. Using mixed methods would have been more relevant and important (Bowling, 2014). Secondly, during the analysis process, this study identified factors affecting dietary choices including parents. Therefore, it would have provided a more comprehensive understanding if this study had explored parental perceptions and attitudes as well as the perspectives of the responsible governmental officials. This would have helped in gaining a holistic view of the subject. Another limitation is the absence of collaboration with other stakeholders who could have worked alongside the primary investigator to develop possible solutions for alleviating the identified problems.

The focus group discussions were of shorter duration than recommended due to the short attention span of adolescents and the high workload of teachers, which is a possible limitation. Additionally, the transcripts were not sent back, and the results were not presented to the participants for member checking, which is a concept used to ensure credibility (Korstjens &

Moser, 2017). The absence of member checking can also be considered as a limitation of this study.

7.Conclusion and Recommendations

The study aims to explore perception of healthy diet, dietary habits and factors affecting dietary choice among adolescents in Addis Ababa, Ethiopia. The students expressed a range of perceptions regarding what constitutes a healthy diet, with considerations for disease prevention, and even blood type and activity level. Many students viewed a healthy diet as synonymous with a balanced diet and the consumption of nutrient-dense food. Most students perceived their current dietary habit as unhealthy, which is also witnessed during observation of students consuming a single or two food groups during breakfast and lunch meal.

There is a change in dietary habits when students compare their current diet with the one, they had a few years back. Teachers noticed the change of dietary habits towards more processed foods which is in line with the current global nutrition challenge that is the nutrition transition.

The school food environment is more conducive for unhealthy dietary habits due to the availability and promotion of unhealthy food options such as French fries, biscuits, and 'ertb' and soft drinks. Conversely, there is a lack of fruit and vegetables near the school compound. Although these items are present in one school environment out of four schools, they are sold in bulk (Kilo) rather than individual pieces, making them inaccessible for the students.

Knowledge and time constraints, certain types of diseases, personal preference of junk foods, peer pressure, economic problems, unavailability of healthier food options, advertisement, community attitude towards healthy diet and lack of birth limit in a family are identified as possible barriers to eating a healthy diet. Body building decisions, family, peer pressure and health care professionals were the motivators to practice healthy diet by the students.

Raising awareness can be done by integrating nutrition courses in the education curriculum, and initiating farming to school and urban agriculture programs. Moreover, building a healthy school food environment, working on the implementation of dietary rules and regulations, and improving the current economic situation are the solutions to improve the dietary habits of adolescents. In general, to correct this situation a holistic change is required with the involvement of all stakeholders.

This study was conducted among urban students and may not represent the entire adolescent population. It is recommended that further studies be conducted to obtain a more complete picture of the factors affecting healthy dietary practices, especially in rural settings.

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9. Appendices

Appendix A Research approval from NSD

Sikt

Notification form / Perception of a healthy diet among adolescents in Addis Ababa,... / Assessment

Assessment of processing of personal data

Reference number
140722

Assessment type
Standard

Date
07/07/2022

Project title
Perception of a healthy diet among adolescents in Addis Ababa, Ethiopia

Data controller (institution responsible for the project)
OsloMet – metropolitan university / Faculty of Health Sciences / Department of Nursing and Health Promotion

Project leader
Marianne Morseth

Student
Mekdes Mekonnen Kifle

Project period
01/09/2022 - 31/12/2023

Categories of personal data
General

Legal basis
Consent (General Data Protection Regulation art. 6 no. 1 a)

The processing of personal data is lawful, as long as it is carried out as stated in the notification form. The legal basis is valid until 31.12.2023.

Notification Form

Comment
ABOUT OUR ASSESSMENT
Data Protection Services has an agreement with the institution where you are carrying out research or studying. As part of this agreement, we provide guidance so that the processing of personal data in your project is lawful and complies with data protection legislation.

We have now assessed the planned processing of personal data. Our assessment is that the processing is lawful, as long as it is carried out as described in the Notification Form with dialogue and attachments.

TYPE OF DATA AND DURATION
The project will be processing general categories of personal data until the date documented in the Notification form.

LEGAL BASIS
The project will gain consent from data subjects to process their personal data. We find that consent will meet the necessary requirements under art. 4 (11) and 7, in that it will be a freely given, specific, informed and unambiguous statement or action, which will be documented and can be withdrawn.

The legal basis for processing general categories of personal data is therefore consent given by the data subject, cf. the General Data Protection Regulation art. 6.1 a).

PRINCIPLES RELATING TO PROCESSING PERSONAL DATA
We find that the planned processing of personal data will be in accordance with the principles under the General Data Protection Regulation regarding:
• lawfulness, fairness and transparency (art. 5.1 a), in that data subjects will receive sufficient information about the processing and will give their consent
• purpose limitation (art. 5.1 b), in that personal data will be collected for specified, explicit and legitimate purposes, and will not be processed for new, incompatible purposes
• data minimization (art. 5.1 c), in that only personal data which are adequate, relevant and necessary for the purpose of the project will be processed
• storage limitation (art. 5.1 e), in that personal data will not be stored for longer than is necessary to fulfill the project's purpose

THE RIGHTS OF DATA SUBJECTS
As long as the data subjects can be identified in the data material, they will have the following rights: access (art. 15), rectification (art. 16), erasure (art. 17), restriction of processing (art. 18) , data portability (art. 20).

We find that the information that will be given to data subjects about the processing of their personal data will meet the legal requirements for form and content, cf. species. 12.1 and art. 13.

We remind you that if a data subject contacts you about their rights, the data controller has a duty to reply within a month.

FOLLOW YOUR INSTITUTION'S GUIDELINES
We presuppose that the project will meet the requirements of accuracy (art. 5.1 d), integrity and confidentiality (art. 5.1 f) and security (art. 32) when processing personal data.

To ensure that these requirements are met you must follow your institution's internal guidelines and/or consult with your institution (ie the institution responsible for the project).

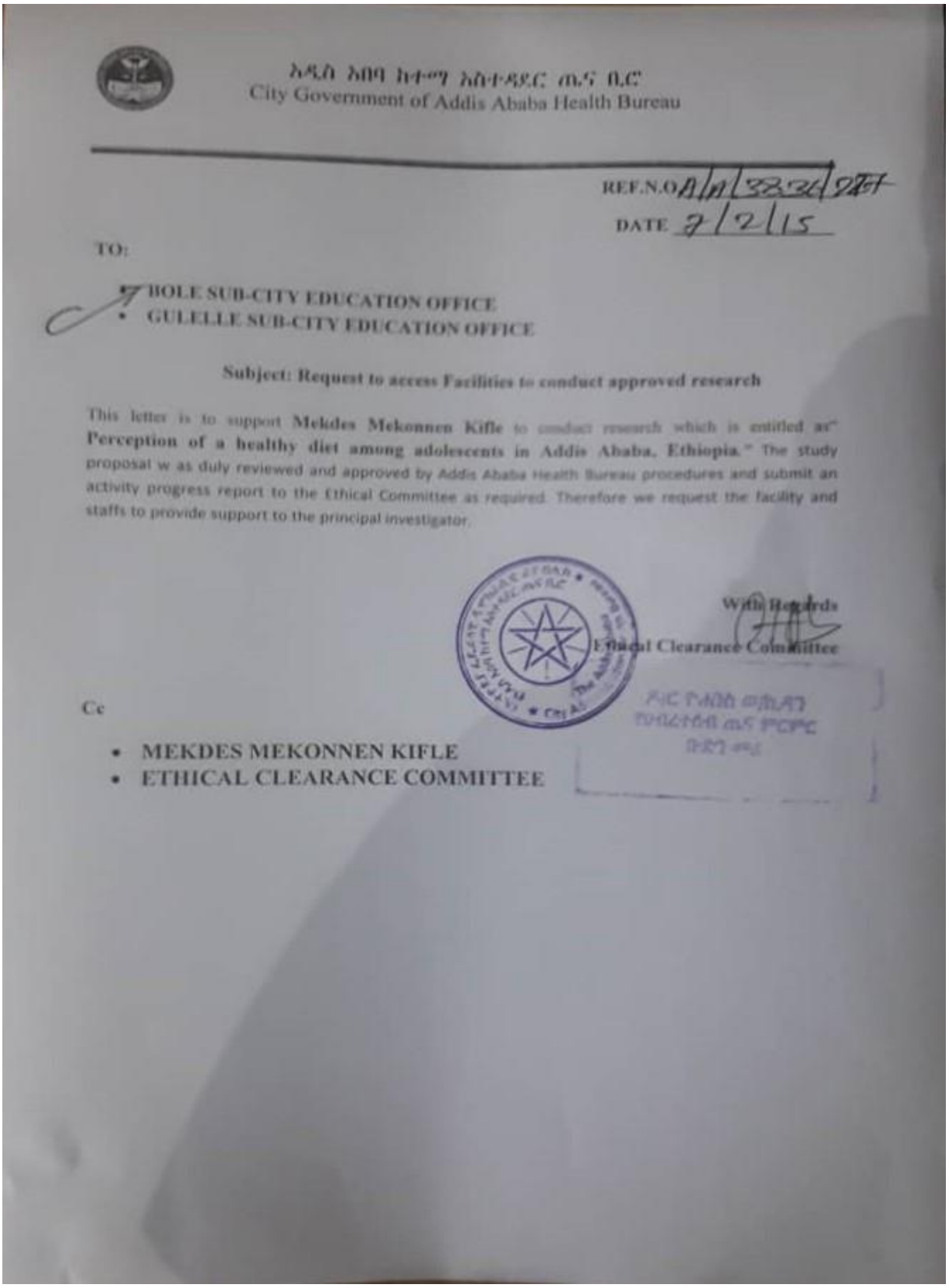
NOTIFY CHANGES
If you intend to make changes to the processing of personal data in this project it may be necessary to notify us. This is done by updating the Notification Form. On our website we explain which changes must be notified: https://www.nsd.no/en/data-protection-services/notification-form-for-personal-data/notify-changes-in-the-notification-form

Wait until you receive an answer from us before you carry out the changes.

FOLLOW-UP OF THE PROJECT
We will follow up the progress of the project at the planned end date in order to determine whether the processing of personal data has been concluded.

Good luck with the project!

Appendix B Research approval from Addis Ababa health bureau



አዲስ አበባ ከተማ አስተዳደር ጤና ቢሮ
City Government of Addis Ababa Health Bureau

REF.NO A/A/3832/9[illegible]
DATE 7/2/15

TO:

- BOLE SUB-CITY EDUCATION OFFICE
- GULELLE SUB-CITY EDUCATION OFFICE

Subject: Request to access Facilities to conduct approved research

This letter is to support **Mekdes Mekonnen Kifle** to conduct research which is entitled as" **Perception of a healthy diet among adolescents in Addis Ababa, Ethiopia.**" The study proposal w as duly reviewed and approved by Addis Ababa Health Bureau procedures and submit an activity progress report to the Ethical Committee as required. Therefore we request the facility and staffs to provide support to the principal investigator.

With Regards

Ethical Clearance Committee

Cc

- MEKDES MEKONNEN KIFLE
- ETHICAL CLEARANCE COMMITTEE

Appendix C Letter of Acceptance from the four schools

በአዲስ አበባ ከተማ አስተዳደር በጉለሌ ክፍለ ከተማ የመድኃኒዓለም አጠቃላይ 2ኛ ት/ቤት
BULCHINSA MAGAALAA FINFINNEE, KUTAA MAGAALAA GULLALLEETTI MANA BARUMSAA OLAANAA SADARKAA 2FFAA MADIHAANAALEMI
ADDIS ABABA CITY GOVERNMENT GULLELE SUB CITY MEDHANEALEM COMPREHENSIVE SECONDARY SCHOOL

ቁጥር መመሠ/084/1+-10
Ref.No
ቀን 11-2-2022
Date

To: - Oslo Metropolitan University

Oslo

Letter of Acceptance

As per the request to conduct a qualitative study with the title "perception of healthy diet among adolescents in Addis Ababa" "Medhanialem General Secondary School" is delighted to work with Dr Mekdes Mekonnen and this letter of acceptance is written to announce our willingness to allow the school for the data collection done by focus group discussion and observation among students aged 16-19 years of age and teachers with in our school.

Best regards

ሳሙኤል ዲነጋ ኦሴና
Samuel Dinega Osena
ርዕሰ መምህር
Principal

በቦሌ ክፍለ ከተማ አስተዳደር ት/ጽ/ቤት ቦሌ አጠቃላይ ሁለተኛ ደረጃ ት/ቤት

WAAJJI A BARNOOTA BULCHIINSA KUTAA MAGAALAA BOOLEETTI MANA BARUMSAA SADARKAA LAMMAFFAA BOOLEE

BOLE S/CITY ADMNISTRATION EDUCATION OFFICE BOLE HIGHER SECONDARY SCHOOL

Date 26/10/2022

Letter of Acceptance

To: - Oslo Metropolitan university

As per the request to conduct a qualitative study with the title "perception of healthy diet among adolescents in Addis Ababa", Bole high school is delighted to work with Dr Mekdes Mekonnen and this letter of acceptance is written to announce our willingness to allow the school for the data collection done by focus group discussion and observation among students aged 16-19 years and teachers with in our school.

Best regards

Taju Mohammed Amdihun

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Ethio-Parents' School

We Strive For Academic Excellence

Date: Oct'26,2022
Ref: ERS/117/25-22

Letter of Acceptance

To: - Oslo Metropolitan university

As per the request to conduct a qualitative study with the title "perception of healthy diet among adolescents in Addis Ababa" Ethio-Parents school is delighted to work with Dr Mekdes Mekonnen and this letter of acceptance is written to announce our willingness to allow the school for the data collection done by focus group discussion and observation among students aged 16-19 years of age and teachers with in our school.

Best regards

Yoseph Yilma Kebede
School Director

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Kgn. Andarge W/Giorgis Memorial School

Ref. No. 51/73/2015
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Date: 28/10/2022
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Letter of Acceptance

To: - Oslo Metropolitan University

As per the request to conduct a qualitative study with the title "perception of healthy diet among adolescents in Addis Ababa" "Kegn Azmach Andarge Memorial School" is delighted to work with Dr Mekdes Mekonnen and this letter of acceptance is written to announce our willingness to allow the school for the data collection done by focus group discussion and observation among students aged 16-19 years of age and teachers with in our school.

Best regards

The School

Appendix D Information sheet to students

Information Sheet

Perception of healthy diet among adolescents in Addis Ababa, Ethiopia

Dear Student

My name is Mekdes Mekonnen, and I am the researcher and Master of Public Health Nutrition Student at Oslo Met –Oslo Metropolitan university in Norway, Europe. As Part of my Master' degree I am conducting a study on Perception of healthy diet among school adolescents in Addis Ababa, Ethiopia.

This is an inquiry about participation in this research project. In this letter we will give you information about the purpose of the project and what your participation will involve.

Purpose of the project

This project is conducted for my master' thesis where the general objective is to explore the perception of healthy diet among adolescents. In my study I want to interview both students and teachers.

Who is responsible for the research project?

Oslo Met-Oslo Metropolitan University, a university in Norway is the institution responsible for the project. My supervisors are Marianne Morseth (mmorseth@oslomet.no) and Laura Terragni lterragn@oslomet.no .

Why are you being asked to participate?

You are attending one of the schools selected for the project; you are in the appropriate age group and your input is valuable to the topic of the study.

What does participation involve for you?

If you choose to participate in the project, this will involve that you take part in focus group discussion. This means that 4-6 people will gather and participate to a common conversation about the perception of adolescents towards healthy diet. It will take approximately 60 minutes. The focus group discussion includes questions about your perception towards healthy and

unhealthy diet. Your answers are audio recorded and I will take notes. The focus group discussion is conducted in the school.

Participation is voluntary

Participation in the project is entirely voluntary. If you chose to participate, you can withdraw your consent at any time without giving a reason. The data you have provided will not be included in the study results. There will be no negative consequences for you if you choose not to participate or later decide to withdraw. This will not in any way affect your relationship with your school.

Your personal privacy – how we will store and use your personal data.

We will only use your personal data for the purpose(s) specified in this information letter. We will process your personal data confidentially and in accordance with data protection legislation (the General Data Protection Regulation and Personal Data Act).

The researcher (Mekdes Mekonnen), the supervisors (Marianne Morseth) and (Laura Terragni) all from Oslo Metropolitan university will have access to your personal data.

The collected data will be stored on a research server, encrypted, and locked away to ensure that no unauthorized persons are able to access the data. Participants will not be recognizable in publications, as all data will be anonymous. The publications will contain some of the statements made in the interviews, but it will be generalized to give insight to the readers.

What will happen to your personal data at the end of the research project?

The project is scheduled to end on 20/07/2023. Your personal data, including any digital recordings will at the end of the project be destroyed and deleted.

Your rights

If you can be identified in the collected data, you have the right to:

- access the personal data that is being processed about you.
- request that your personal data is deleted.
- request that incorrect personal data about you is corrected/rectified.
- receive a copy of your personal data (data portability), and

- send a complaint to the Data Protection Officer or The Norwegian Data Protection Authority regarding the processing of your personal data

What gives us the right to process your personal data?

We will process your personal data based on your consent. Based on an agreement with Oslo Metropolitan University, Data Protection Services has assessed that the processing of personal data in this project is in accordance with data protection legislation.

Where can I find out more?

If you have questions about the project, or want to exercise your rights, contact:

- Oslo Metropolitan university via the researcher Mekdes Mekonnen Kifle s360181@oslomet.no , supervisor Marianne Morseth mmorseth@oslomet.no and Laura Terragni lterragn@oslomet.no
- Our Data Protection Officer: Ingrid Jacobsen at OsloMet, Oslo Metropolitan university
- Data Protection Services, by email: (personverntjenester@sikt.no) or by telephone: +47 53 21 15 00.

Yours sincerely,

Student (if applicable) researcher

Mekdes Mekonnen Kifle

Appendix E Information sheet to teachers

Information Sheet

Perception of healthy diet among adolescents in Addis Ababa, Ethiopia

Dear Teachers

My name is Mekdes Mekonnen, and I am the researcher and Master of Public Health Nutrition Student at Oslo Met –Oslo Metropolitan university in Norway, Europe. As Part of my Master' degree I am conducting a study on Perception of healthy diet among school adolescents in Addis Ababa, Ethiopia.

This is an inquiry about participation in this research project. In this letter we will give you information about the purpose of the project and what your participation will involve.

Purpose of the project

This project is conducted for my master' thesis where the general objective is to explore the perception of healthy diet among adolescents. In my study I want to interview both students and teachers.

Who is responsible for the research project?

Oslo Met-Oslo Metropolitan University, a university in Norway is the institution responsible for the project. My supervisors are Marianne Morseth (mmorseth@oslomet.no) and Laura Terragni lterragn@oslomet.no .

Why are you being asked to participate?

You are teaching in one of the schools selected for the project and your inputs are valuable to the topic of the study.

What does participation involve for you?

If you choose to participate in the project, this will involve that you take part in focus group discussion. This means that 4-6 people will gather and participate to a common conversation about the perception of adolescents towards healthy diet. It will take approximately 60 minutes. The focus group discussion includes questions about perception towards healthy and unhealthy

diet, factors influencing adolescents' dietary choice. Your answers are audio recorded and I will take notes. The focus group discussion is conducted in the school.

Participation is voluntary

Participation in the project is entirely voluntary. If you chose to participate, you can withdraw your consent at any time without giving a reason. The data you have provided will not be included in the study results. There will be no negative consequences for you if you choose not to participate or later decide to withdraw. This will not in any way affect your relationship with your school.

Your personal privacy – how we will store and use your personal data

We will only use your personal data for the purpose(s) specified in this information letter. We will process your personal data confidentially and in accordance with data protection legislation (the General Data Protection Regulation and Personal Data Act).

The researcher (Mekdes Mekonnen), the supervisors (Marianne Morseth) and (Laura Terragni) all from Oslo Metropolitan university will have access to your personal data.

The collected data will be stored on a research server, encrypted, and locked away to ensure that no unauthorized persons are able to access the data. Participants will not be recognizable in publications, as all data will be anonymous. The publications will contain some of the statements made in the interviews, but it will be generalized to give insight to the readers.

What will happen to your personal data at the end of the research project?

The project is scheduled to end on 20/07/2023.Your personal data, including any digital recordings will at the end of the project be destroyed and deleted.

Your rights

If you can be identified in the collected data, you have the right to:

- access the personal data that is being processed about you
- request that your personal data is deleted
- request that incorrect personal data about you is corrected/rectified
- receive a copy of your personal data (data portability), and

- send a complaint to the Data Protection Officer or The Norwegian Data Protection Authority regarding the processing of your personal data

What gives us the right to process your personal data?

We will process your personal data based on your consent. Based on an agreement with Oslo Metropolitan University, Data Protection Services has assessed that the processing of personal data in this project is in accordance with data protection legislation.

Where can I find out more?

If you have questions about the project, or want to exercise your rights, contact:

- Oslo Metropolitan university via the researcher Mekdes Mekonnen Kifle s360181@oslomet.no , supervisor Marianne Morseth mmorseth@oslomet.no and Laura Terragni lterragn@oslomet.no
- Our Data Protection Officer: Ingrid Jacobsen at OsloMet, Oslo Metropolitan university
- Data Protection Services, by email: (personvernтjenester@sikt.no) or by telephone: +47 53 21 15 00.

Yours sincerely,

Student (if applicable) researcher

Mekdes Mekonnen Kifle

Student (if applicable) (Researcher)

Appendix F Assent form for students

Informed assent form for students

Title of the Research

Perception of healthy diet among adolescents in Addis Ababa, Ethiopia

Name of Researcher

Mekdes Mekonnen Kifle, Oslo Metropolitan University, Norway

Assent form

I have received and understood information about the project "Perception of healthy diet among adolescents towards healthy diet in Addis Ababa, Ethiopia" and I have been given the opportunity to ask questions. I understand that I am free to withdraw from studying at any time. I hereby participate in this study under the following conditions.

I understand that the focus group discussion will be audio recorded, pictures of my school lunch will be taken by the researcher, my teacher will give information regarding my dietary practice and that my data will be processed until the end of the project approximately June 20, 2023.

Do you want to participate in this study? Yes…… No…….

Participant code……....

Participant signature……

Date……

Appendix G Consent form for teachers

Informed Consent form for Teachers

Title of the research

Perception of healthy diet among adolescents in Addis Ababa, Ethiopia

Name of the researcher

Mekdes Mekonnen Kifle, Oslo Metropolitan University, Norway

Consent and conditions of Consent

I have received and understood information about the project and have been given the opportunity to ask questions. I understand that I am free to withdraw from the study at any time. I hereby give consent to participate in this study in the following conditions.

I consent to the Focus group discussion to be audio recorded. Yes …… No……...

I consent to be quoted (without name) in the publications based on the research. Yes ……...
No……

I consent for the data to be processed until the end of the project approximately June 20, 2023.

Yes……... No……

Participant code……

Participant signature……...

Date……...

Appendix H Focus group guide for students

Focus group discussion guide for students

1. How do your meals look like?

-How many times do you have a meal in a day usually?

-What foods and beverages do you eat usually?

-Why do you think that is?

-What foods do you eat when you are with your friends?

-what do you think, other influence on what you eat?

2. Do you think your dietary practice changed from the past?

- How? Why?

3. What does the term "healthy diet "mean to you?

-Which foods do you consider as healthy and unhealthy why?

4. Where do you get information about healthy diet?

5. Is there anything or anybody that motivates you to healthy diet?

-What are these? (Individual, peers, family, society)

6. Is there anything or anybody that is barrier for having healthy diet?

-What are the barriers? (Individual, peers, family, society)

7. Is it easy or difficult to have healthy diet for adolescents? Why?

8. What are the benefits of healthy diet to adolescents?

9. Do you think advertisements have an influence on dietary practice?

-How does it affect you? How do you feel about that?

-what kind of advertisements influences unhealthy diet, why?

10. What do you think can be done for adolescents to eat healthier diet?

Appendix I Focus group guide for teachers.

Focus group discussion guide for teachers

1. What type of foods and beverages is consumed by the students most of the time?
2. What do you think about the food they eat and drink?
3. Are there barriers to students consuming a healthy diet? What are the barriers?
4. What do you think influences what they eat?
5. Do you think the dietary practice as adolescent changed currently from your time?
6. What do you think should be done for students have healthy dietary practice?

-what kind of interventions is important for students to practice a healthy diet?

7. Do you have any last comment?

Appendix J Observation guide

Observation guide

1, What are the foods consumed by the students for the breakfast?

-Does it contain vegetables, fruits?

-What are the drinks being consumed

-Do they consume fast foods?

-Do they bring food for breakfast from home or use from canteen?

2, What are the foods consumed by the students for lunch?

-Does it contain vegetables, fruits?

-Do they bring food for lunch from home or use from canteen?

-What are the drinks being consumed

-Do they consume fast foods?

3. Where does the students eat their lunch and breakfast?

4. What foods are available in the school canteen?

5. What are the foods available in the school environment?