MAKERERE UNIVERSITY

COLLEGE OF AGRICULTURAL AND ENVIRONMENTAL SCIENCES

SCHOOL OF FOOD TECHNOLOGY, NUTRITION AND BIO ENGINEERING

DEPARTMENT OF FOOD TECHNOLOGY AND NUTRITION

TELEVISION MARKETING OF UNHEALTHY FOODS AND FOOD CHOICE AMONGST PRIMARY SCHOOL-AGE CHILDREN IN KAMPALA

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A SPECIAL PROJECT REPORT SUBMITTED TO THE DEPARTMENT OF FOOD TECHNOLOGY AND NUTRITION IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF BACHELORS OF SCIENCE IN HUMAN NUTRITION OF MAKERERE UNIVERSITY

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DECLARATION

I, **WONTANGA EMMY** hereby declare that this special project is my original work and has never been published or submitted to any institution(s) for the any award.

Signature: .....

Date : 04/09/2019

APPROVAL

This special project report has been submitted for examination and award of a Bachelor's Degree in Human Nutrition of Makerere University with my approval as the supervisor.

Signature: .....

Date : 7/9/19

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DEDICATION

To my mother, Auma Mary Theresa, for all the amazing love and hope you have given to me.

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I thank the almighty God for His great love and care that has enabled me to complete this final story of my academic journey. For the spiritual support, I greatly thank my pastors Franklin Mucunguzi and his wife Deborah Mucunguzi. Thank you to the Flames Church Wandegeya for all the spiritual support.

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ACRONYMS AND ABBREVIATIONS

BMI	Body Mass Index
HFSS	High in saturated fats, sugar and salt
TV	Television

OPERATIONAL DEFINITIONS

Child: Any individual (child) aged 10 to 14 years old

Coercion or pester power: Ability to influence their parent(s) into buying a certain product or brand.

Food choice: The preference of one food over another.

Unhealthy food: A food or drink high in saturated fats, sugar and salt (HFSS).

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ABSTRACT

Background:

There majority of television adverts targeted to children are for unhealthy foods. The increased time spent by children watching television increases their exposure to unhealthy food adverts which is associated with increased preference for unhealthy foods. Most studies on the association between unhealthy food advertising and child food preference have been conducted in developed countries. Unhealthy food adverts on television are associated with children's food preferences.

Objective:

This study aimed at finding out the knowledge of Ugandan children about unhealthy food marketing on television, the most popularly advertised foods and the influence of television food marketing of unhealthy foods on children on their food choices.

Methods:

This was a cross sectional study. Primary school-age children (n = 86) aged 10 to 14 years from Nakasero Primary School were included in this study. Children's knowledge of television food adverts, food preference and television viewing habits were assessed using a self-administered questionnaire. Knowledge of television food adverts was scored by children's recall of food adverts, the nature of adverts they found appealing. Food preference for unhealthy foods was assessed using a likert scale with smiley faces. Both the amount of time spent watching television as well as watching television beyond 9:00 pm were recorded to determine television viewing habits. Random sampling was done in the three streams of primary six class. Assessment of nutritional status was done anthropometrically (height and weight) to determine Body Mass Index. Chi-square tests and Independent sample t-tests were done to generate p-values.

Results:

The children were aged 10 to 14 years with a mean of the children was 11.59 years. Majority of the children were Ugandan (94.2%). Most of the children's mothers were businesswomen. The prevalence of underweight, overweight and obesity were 3.5%, 11.8% and 1.2 %, respectively. The mean score of knowledge of healthiness of diet was (5.44 ± 2.53). The preference for

unhealthy foods (19.13 ± 3.35) was higher than for healthier foods (15.09 ± 2.88). Both Length of watching television and watching television beyond 9:00 pm were found significantly associated with unhealthy food preference, $p < 0.05$. Location and availability also influence food preference as well as their consumption.

Conclusion:

The children were knowledgeable of the unhealthy food adverts on television and they could describe the nature of those adverts they found appealing. The popular food adverts were for ice cream, chips, pizza, soda and water. Both length of watching television and watching television beyond 9:00 pm were significantly associated with unhealthy food preference. Therefore, there is need for parental restriction of time children spend watching television especially to not go beyond 9:00 pm.

CHAPTER ONE: INTRODUCTION

1.1. Background of the study

Food choice is a complex human behavior determined not only by physiological and nutritional needs of an individual. In children, food choice is formed early in life through primary socialization (Fieldhouse, 1996) and influenced by other forces later. According to Yeomans (2007), human appetite influences food choice by ensuring that we are protected against nutrient shortage and are able to exploit scarce food supplies. It has been shown that people who have different food choice motives differs in preferences for selected food products (Wądołowska, Babicz-Zielińska, & Czarnocińska, 2008).

Studies have confirmed the strong influence of income on food choice with economic factors and satiety being main determinants among low income individuals (Dowler & Calvert, 1995; Ares , Machín, Girona , Curutchet, & Giménez , 2017), and convenience being main determinant of food choice among middle income individuals. Even among children, extensive food choice is available to individuals who have the necessary resources (Lang & Heasman, 2004). A lack of social support, limited access to healthful foods, a lack of cooking skills and of nutritional knowledge have also been reported to be among the main determinants of the eating patterns of low-income populations (Appelhans , Waring , Schneider , & Pagoto , 2014; Cortés , Millán-Ferro, Schneider , Vega , & Caballero , 2013). Nutrition facts label has been assumed to improve food choice but existing literature indicates that the nutrition label has little effectiveness on selecting healthy food (Helfer & Shultz, 2014; Elbel, Gyamfi, & Kersh, 2011).

Bargiota et al. (2013) found that adolescents' concerns about their body image were an important contributing factor in choosing food. Studies that have evaluated food habits in adolescents have discovered low health concerns in adolescents' food choices ((Ree , Riediger , & Moghadasian, 2008; Striegel-Moore , Thompson , & Affenito, 2006; Bargiota, Delizona, Tsitouras, & Koukoulis, 2013). Ensaff et al. (2015) found that taste, appearance, personal food history, habits and familiarity were important influences on food choice. Girls have been found more likely than boys to make healthier food choices (Bargiota, Delizona, Tsitouras, & Koukoulis, 2013; Elbel, Gyamfi, & Kersh, 2011; Harnack , et al., 2008). Bouhlal et al. (2015) demonstrated that child gender may

influence mothers' food choices, as the caloric content of boys' meals was higher than girls' and this extra caloric difference was from the less healthy food category.

Guerrero et al. (2016) reported that the frequency of out of home meals with fathers were associated with consumption of unhealthy foods by the children. In addition, they found that when fathers ate breakfast with their children, sweetened beverage consumption decreased. A study by Scaglioni et al (2018) found that adolescents and children who joined in fewer family meals consume more unhealthy food. Indeed, a positive relation was found between frequent family meals and greater consumption of healthy foods (McIntosh, et al., 2011).

The downside to the extensive range of foods available in children's environments is that they are high in saturated fats, trans-fatty acids, added sugars and salt (Mercer, Johnstone, & Halford, 2015). There is argument on the definition of unhealthy foods, but most countries agree on it being high in saturated fat, trans-fatty acids, free sugars, and salt (World Health Assembly, 2010).

To make food choices, children have to consider what, how, when, where and with whom they will eat, as well as selecting and consuming foods (Lawrence & Barker, 2009).The price (Darmon & Drewnowski, 2015), taste and convenience of a food are also considered (Glanz, Basil, & Maibach, 1998). Sometimes children's food choice is influenced by the menu (Vanderlee & Hammond, 2013). Children's food choice is also determined by their nutritional knowledge. Although some studies have not shown an association between good nutritional knowledge and healthy food choices in children (Murphy, Youatt, & Hoerr, 1995; Gibson, Wardle, & Watts, 1998), others have found a positive relationship (Pirouznia, 2001; Bannon & Schwartz, 2006).

The single strongest factor affecting children's food choice on the societal level is television advertising (Risvas, Panagiotakos , & Zampelas, 2007; Cairns, Angus, & Hastings, 2009). There is increased selection (Halford, et al., 2017) and consumption of energy dense food when watching television. Children's liking of branded food is increased by watching television adverts (Boyland, Kavanagh-Safran, & Halford , Exposure to 'healthy' fast food meal bundles in television advertisements promotes liking for fast food but not healthier choices in children, 2015) with brand recognition increasing with age (Ueda , et al., 2012). Compared with other children, those who recall unhealthy branded food and beverage products have stronger preferences for such products (Cornwell & McAlister, Alternative thinking about starting points of obesity. Development of

child taste preferences. Appetite., 2011). Children's knowledge of unhealthy food and beverage products increases their obesity risk (Cornwell, McAlister, & Polmear-Swendris, 2014; Galbraith-Emami & Lobstein, 2013; Cairns, Angus, & Hastings, 2009).

1.2. Statement of the problem

Most research on food choice as well as television marketing of unhealthy foods have been carried out in developed countries. No study has been done to find out the most popular food adverts amongst Ugandan children and adolescents. There is no known study indicating whether or not Ugandan children even know this adverts yet there are numerous food adverts on television. Most importantly, the extent to which the children and adolescents apply the information about unhealthy foods they see on television is not known.

1.3. Objectives

i. To find out if Ugandan children's knowledge of unhealthy food adverts on television
ii. To find out the popular food adverts among Ugandan children and adolescents
iii. To find out the extent to which the unhealthy food adverts influence their food choice

1.4. Significance of the study

This study will add knowledge of what food adverts children are exposed to on television. The findings will also be a basis for determining the impact unhealthy food adverts have on the children's food choice in Uganda.

CHAPTER TWO: LITERATURE REVIEW

2.1. Food choice

A broad range of interrelated factors may be associated with food choices: personal factors (e.g. food preferences, taste, appeal of food, convenience, time constraints, cost), socio-environmental factors (e.g. family, home food availability, peers, school food environment, away-from-home eating) and behavioural factors (e.g. meal patterns) (Fitzgerald, et al., 2010).

Fitzgerald et al. (2010), found that while young people have a good understanding of what it means to eat healthily, nutritional knowledge may not be the main determinant of food choice. Rather, food preferences appear to be the central motivation for young people's food choices (Russell & Worsley, 2013). Qualitative studies found similar perceptions among young people and revealed that factors such as taste, texture, appearance and smell were more important than nutritional knowledge in influencing food choices (Fitzgerald, et al., 2010).

Children model themselves on their parents' eating behaviours, lifestyle, eating-related attitudes, and satisfaction or dissatisfaction regarding body image (Cuellar, Jones, & Sterrett, 2015). Children's ability of imitating the actions of the others and learning by observation in particular from their parents' and caregivers' could explain the kind of food styles developed (Zarychta, Mullan, & Luszczynska, 2016). Mothers also influence children directly during mealtimes; mothers of obese children may alter their feeding behaviour differentially based on food type (Mosli, et al., 2015). Maternal actions also act indirectly by shaping the behaviour of siblings that may act as caregivers and role models.

Early in life, most infants and children prefer sweet and salty flavours. Sweetness is a potent psychobiological stimulus for many animal species, particularly for humans of all ages. Sweetness clearly increases the palatability of foods and beverages, stimulating intake (Asano, Hong, & Matsuyam, 2016). Bitter flavours, such as those in some vegetables, are often rejected when first experienced, but accepted with increased exposure. Perception of taste may be varying between individuals depending on variations in taste receptors genes (Hetherington, et al., 2015).

2.2. Unhealthy foods

Evidence review illustrates that 'unhealthy diets' has been conceptualized and interpreted differently (Candari , Cylus , & Nolte , 2017). For example, definitions of unhealthy diets often refer to those high in specific nutrients such as saturated fats, salts or sugars, but growing evidence suggests that intakes of specific foods rather than macro- or micro-nutrients are most relevant for the development of chronic disease (Morgan , 2012; Mozaffarian , Appel, & Van Horn, 2011).

Healthiness of a diet may be identified and defined based on recommended intakes of selected food groups. This is illustrated by Micha et al. (2015), who described optimal consumption levels of selected food groups, based on probable or convincing evidence about the association of intake levels and the risk for coronary heart disease, stroke, type II diabetes and certain cancers. An unhealthy diet can be defined as one that does not meet the recommended intake levels of selected food groups. Even with this approach there remains the problem of how to score different levels of deviation from optimal intake. In this study, 'unhealthy food' refers to food high in saturated fats, sugar and salt (HFSS).

There is little information available on the places where energy dense snack foods and energy-dense drinks are consumed, although home and school seem most common (Briefel , Wilson , & Gleason , 2009; Kerr , McCrorie , & Rennie , 2010). Some studies have reported the most commonly consumed types of energy dense snack foods and energy-dense drinks, but their results are hard to compare due to differences of categorization (Kerr , Rennie, & McCaffrey , 2009). Access to healthy and unhealthy food affects the nutritional choices available to a community. Currie et. al. (2010) found that having a fast food restaurant located within one tenth of a mile increased child obesity rate. Davis and Carpenter (2009) also found that having fast food restaurants within one-half mile reduced consumption of fresh fruits and vegetables while consumption of soda increased with children more likely to be overweight or obese.

According to Sproesser et. al. (2015), there is a positive self-bias when people are asked about their perceived unhealthiness of diets. When asked to choose probable diets, people chose healthier foods for themselves and more unhealthy foods for others indicating a bias for 'self' over 'others'.

Thus people hold themselves to different standards compared to others within different eating situations.

Children from low socio-economic backgrounds have been found to be at risk for high energy dense snack foods and energy-dense drinks consumption (Craig , McNeill , & Macdiarmid , 2010; Totland , Lien , & Bergh, 2013).

2.3. Television advertising

Children are more vulnerable, less able to understand the persuasive technique of advertisement, their recognition of bias and deception in advertising and have least cognitive defenses towards television advertisement (Sakthipriya & Ramesh, 2016). It has been reported that food promotion had a direct effect on children's nutritional knowledge, preferences, purchasing behaviors, consumption patterns and diet-related health (Cairns, et al., 2012). Exposure to food advertising can favorably influence product evaluations, enhance the desire to consume advertised products and increase perceptions of their social acceptability (Pettigrew, et al., 2013).

Television (TV) advertising during children's viewing hours predominantly promote foods high in sugar, fat and/or salt (Huang et al., 2012). TV marketing of these foods employed highly persuasive techniques to encourage regular consumption and repeat purchases (Hebden, King, & Kelly, 2011). Moreover, the impact of TV food advertising has extended to other products in the same product categories (Andreyeva, Kely, & Harris, 2011).

Food and beverage companies use product placements to market directly to children (Federal Trade Commission, 2012). This technique raises additional concerns when aimed at children and adolescents, as the persuasive intent of the message is disguised (Rozendaal , Lapierre , & van Reijmersdal , 2011)**.** Product placements will likely remain a significant marketing tool for reaching young people as time-shifted viewing, mobile devices and the Internet enable young viewers to increasingly avoid traditional advertising (Nielsen, 2015) and as tools for retrospectively inserting branded content into programming arise (Mirriad, 2015)**.** Placements in movies also continue and have been highlighted in previous research (Federal Trade Commission, 2012; Harwell , 2015). Companies use brands to convey product attributes, generate loyalty and credibility, and connect with buyers on an emotional level. (Healthy Eating Research, 2015). Such

branding may affect children as young as 3 years of age (Tatlow-Golden , Hennessy , & Dean, 2014).

When resources are limited, TV and low cost snacks may be more available options for family time compared with a trip to the movie theatre (Haines , O'Brien , & McDonald, 2012). According to the Federal Trade Commission (2012), most children's television advertising exposure occurs in the afternoons and evenings, far more than Saturday mornings, the stereotypical domain of young children's cartoon shows. Half of children's television food advertising exposure comes from children's shows, in which children are at least 50 percent of the audience.

Children's exposure to healthy foods in their early years helps set the stage for healthy eating, and parents play a critical role in modeling and enforcing good habits at home (Harris , Brownell, & Bargh, 2009). There is limited research on the relationship between television adverts, unhealthy foods and food choice in Uganda. Where studies were done, mostly younger children were in included. There is also limited research on places where children eat unhealthy foods. Therefore, this study will add more literature in the mentioned areas.

2.4. Relationship between food choice and food adverts

Children's exposure to advertising for calorie-dense nutrient poor foods is associated with increased overall consumption of the unhealthy food categories commonly advertised to children (Andreyeva, Kely, & Harris, 2011; Ford, Ward , & White , 2012). Advertising has a modest, direct effect on children's food choices and a larger but unquantifiable indirect effect on children's food preferences, consumption and behavior (Garde, Davies, & Landon, 2017). Pester power, defined as 'a child's ability to pester their parents into buying a certain product or brand' (Goldstein, 2016), is increased by television advertising. A 2016 European-wide study into pester power showed an increased likelihood of children who asked for items seen on television being overweight (Huang, 2016). Moreover, parents from households of a lower socio-economic group can be more susceptible to pester power (Aznar, et al., 2016).

According to Federal Trade Commission (FTC) (2012), viewing large amounts of television during childhood has been associated in multiple studies with unhealthy dietary habits and high body

mass indexes later in life**.** Although many factors affect children's diets and food preferences, several studies have found that food advertising has a specific effect separate from those factors.

According to Uganda Bureau of Statistcs (UBOS), (2017), 4.9 % and 2.6% of males and female children under 5 years of age are overweight when weight-for-height z-scores are used for classification of nutritional status. Overall, 3.7% of children under five were overweight in Uganda in 2016. There is moderate evidence that advertising affects the usual, day-to-day eating habits of two to five year-olds, and weak evidence that this is so for six to eleven year-olds (Federal Trade Commission, 2012). Overweight and obesity contributes to the global burden of death and disability from non-communicable diseases e.g. type II diabetes, cardiovascular disease (de Onis, et al., 2012) and certain types of cancer.

CHAPTER THREE: METHODOLOGY

This chapter includes the methodology that was used for the study. It describes the study area, research design, population involved in the study, subject selection/samples/sampling, data collection procedures, data collection tool and the instruments and data analysis.

3.1. Area of the study.

The study was conducted in Nakasero Primary School, primary school in urban Kampala due to the higher household television ownership in urban compared to rural areas i.e. 33.3% and 14% respectively (The Collaboration on International ICT Policy for East and Southern Africa (CIPESA), 2018). Kampala is the capital city of Uganda, located in central Uganda.

Nakasero Primary School is located in Kampala along Kyadondo road. It is a government aided primary school with pupils of both sexes.

3.2. Study design

The study was cross sectional involving collection of data at one given point of time.

3.3. Methodology and sampling

One class- Primary six – was included in the study. Children were selected randomly from the three streams of primary six.

3.4. Target population

The study included pupils aged 10 to 14 years from an urban primary school in Kampala. This age group has been excluded in most studies who focused on younger children. Also, children in this age group are more literate and able to fill questionnaires. The class included was Primary six as this has children of the desired age group.

3.5. Sample size

The following formula (Daniel, 1999) was used:

$$n = \frac{Z^2 P(1-P)}{d^2}$$

Where;

n = sample size,

Z = Z statistic for a level of confidence,

P = expected prevalence or proportion

d = precision

Using 95% confidence interval,

Z = 1.96

The prevalence of children who watched television was unknown thus the prevalence of urban households that own televisions was used.

P = 33.3%

P = 0.333

The precision used was 10 percent due to limited resources.

d = 10%

d = 0.1

Therefore,

$$n = \frac{(1.96)^2(0.333(1-0.333))}{(0.1)^2}$$

$$n = 85.3261$$

$$n \approx 86$$

Therefore, the sample size was 86 pupils

3.6. Tools

The study was done using a self-administered questionnaire, under the guidance of the researcher. The questionnaire had the following sections: i) demographics and self-reported food preference, ii) food preference of healthy and unhealthy foods, iii) knowledge of healthy diets, iv) television advertising and v) anthropometry.

3.6.1. Assessment of knowledge of unhealthy food marketing

The children's knowledge of healthy foods was assessed to determine whether they could differentiate between healthy and unhealthy advertised foods. A section on knowledge of healthy diets was included in the questionnaire. This section listed nine pairs (Table 2) of foods or drinks. The healthier choice of each pair was assigned a value of '1' and the other food or drink, '0'. The scores were summed to form a scale from 0 (Lowest knowledge score) to 9 (highest knowledge score). The higher the score one got, the more knowledge one had of what foods were healthier

During administration of the questionnaire, the preference section came before the section on healthiness of food to prevent response bias.

3.6.2. Assessment of the most popularly advertised foods

Participants were required to list foods they had seen on television in a section of the questionnaire. This assessed the food adverts they had been exposed to. Children were also asked to describe the nature of the food adverts in terms of the marketing technique employed. Use of cartoons, celebrity

endorsement, music and appearance of food (palatability) were listed as options to assess the marketing techniques employed. The questionnaire is attached at the appendix.

3.6.3 Assessment of the influence of unhealthy food adverts

I. Influence of unhealthy food adverts on food preference

The children were asked to list the foods they would like their parent(s) to purchase for them to capture the children's self-reported food preference. The frequency of the foods were summed to rank the foods in terms of frequency. The most popular foods of preference were later compared with the most popular food adverts to see if there were any similar foods.

II. Influence of food adverts on knowledge of healthy and unhealthy foods.

The influence of television adverts on food preference was measured by including a section on food preference for healthy and unhealthy foods, in the questionnaire. The preference section was adapted from a food preference questionnaire developed by McGuerty (2014). Fewer food groups were used and some of the food items included by McGuerty were replaced. This section measured both healthy and unhealthy food preference using a likert scale. The foods were grouped in terms of healthiness (Table 1). Word description of a child's preference to a food was accompanied by smiley faces. A child was required to select only one smiley face The following values were assigned to the smiley faces: '1' for 'Not interested', '2' for 'Not sure', 3 for 'Interested' and '4' for 'Very interested'. There were six questions each for healthy and unhealthy food preference with a maximum score of 24 for either after summation.

The questionnaire also assessed television ownership and amount of time spent watching television to determine any influence on food choice. Influence of adverts on food choice in the form of purchase by child or purchase requests made to the parent were also assessed using the questionnaire. Television audience and the most popular locations of consumption of the foods advertised on television were assessed

Table 1: Groupings of food included in the preference section

Energy-dense foods	**Energy-dilute foods**	**Sugar-sweetened beverages**	**Unsweetened beverages**
Chips	Cabbages (raw or cooked)	Jolly Jus or Pop drink	Water
Donut	Carrots	Soda	Tea with no sugar
Cookies	Yellow banana	Tea with sugar	Porridge with no sugar

Table 2: Food pairing included in the knowledge of healthy food section

Classification	**Unsaturated fat**	**Added sugar**	**Salt**
Examples of food paring	i) Rollex (chappati and fried eggs) and boiled egg	Soda and water	Avocado with salt and Avocado eaten with no salt
	Ice cream and Boiled Fresh Cow milk	Mango and Biscuit	Gorrillos attack and Roasted Groundnuts
	Muchomo (Roasted meat) and Meat cooked at home	Mandazi and Boiled Cassava	Snack Attack and Boilled maize

3.6.4. Measurement of nutritional status

Anthropometry was done. The anthropometric indicator, Body Mass Index (BMI), was used to classify obesity and overweight. BMI relates weight and height. The indicator requires a population specific cut-off (de Onis & Lobstein, 2010). By April 2011, Uganda had adopted the WHO Child Growth Standards (de Onis, et al., 2007; de Onis M. , 2013) which was used in this study. The determination of BMI was be done using standardized techniques for measuring weight and height (Lohman, Roche, & Martorell, 1991).

Weight

This was measured using a weighing scale. The weighing scale was borrowed from the school of Food technology, Nutrition and Bio-Engineering.

Procedure for measuring weight

i. The weighing scale was placed on a firm, flat surface-the classroom floor.
ii. The participant was requested to remove any coats, heavy sweaters, shoes, keys or heavy pocket contents.
iii. The participant was then asked to stand in the middle of the scale's platform with the body weight equally distributed on both feet.
iv. The participant weight was measured in kilograms to the nearest 0.1 kg (100 grams).

Height

This was measured using a height board. The child was measured while standing. The height board used was borrowed from the school of Food technology, Nutrition and Bio-Engineering.

The measurement of stature requires a vertical board with an attached metric rule and a horizontal headboard that can be brought into contact with the most superior point on the head. The combination of these elements is called a height board.

Procedure for measuring height

i. The participant was requested to remove their shoes.
ii. The participant then stood with heels together, arms at sides, legs straight, and shoulders relaxed.
iii. It was ensured that the participant's heels, buttocks, and shoulder blades and head were in contact with the vertical board. For participants who could not place all four body parts against the board, it was ensured that at least the buttocks and heels or buttocks and head were touching the board.
iv. The participant's head was positioned so that the eyes were looking straight forward, without lifting their chin.
v. Just before taking the measurement, the participant was reminded to keep his or her shoulders relaxed.
vi. The headboard was lowered to the highest point of the head, making sure that the hair was compressed. If the participant had thick braids, as accurate a measurement as possible was made.
vii. The height was measured to the nearest 0.1 cm. The researcher made sure that their eyes were level with the headboard when recording the measurement

3.7. Data collection

Data for this study was collected by use of self-administered questionnaires, that is, the children were guided to fill them

Procedure for collecting data

The data collection was done at the school i.e. Nakasero Primary School, at the beginning of the second term of primary school academic calendar, that is on 29th May, 2019. The questionnaires were distributed to the children in classrooms and filled with guidance of the instructor.

The weight and height of the children were measured on the same day.

3.8. Statistical analyses

Data was entered using the Statistical Package for Social Science (SPSS version 16.0, 2007 SPSS Inc.; Chicago, USA). Chi-square tests and independent student t-tests were done to generate p-values. Univariate analyses were conducted to obtain summary statistics (frequencies, means and standard deviations) and associations between variables of nutritional status and knowledge of unhealthy food adverts on television, food preference and knowledge of healthy diets. A *p* value of 0.05 was used as level of significance.

3.9. Ethical consideration

Participation in the study was voluntary. Consent was obtained from the school head teacher for child recruitment into the study. It was made clear to the children that they totally had the right not to participate. Children were asked for verbal consent as well as written consent. They were also made to know that the study would not affect their school academic scores. Names of children were not be collected and rather identification numbers were generated. Reporting was done in groups without names.

3.10. Funding

The study was self-funded.

CHAPTER FOUR: RESULTS AND DISCUSSION

4.1. Results

This chapter contains results of the study with key consideration of the significant results. The demographics and key variables are summarized in Table 3.

4.1.1. Participant demographics and other characteristics

All the participants were aged 10 to 14 years, with more than half being male, majority of who were Ugandan (94.2%) and Baganda (41.9%). More than half (64%) reported their mother's occupation as being businesswomen. All participants reported having televisions (TV) at home with 79.0% having watched TV the day of the study or within that same week. About 71.7% reported watching TV beyond 9:00 pm, 94.4% reported ever seeing food(s) or drink(s) on TV, 93.3% of whom liked the advertised food(s) or drink(s).

Only 11.8% and 1% of the participants were overweight and obese respectively.

More than three-quarters of the participants watched TV for more than two hours, with more than half (56.1%) reporting coercing a parent to purchase advertised food (Table 3).

4.1.2. Children's knowledge of unhealthy food adverts on television

This study found that not only have Ugandan children been exposed to unhealthy food adverts on television but also that they know their nature. Majority (96.4%) reported having ever seen a food advert on TV. Participants who reported liking TV food adverts described their nature as looking nice and yummy in appearance (56.4%), having a nice song (52.6%), a cartoon (39.7%) and having a nice appearance of boys or girls in the advert (26.9%). Only one child (2.6%) reported liking the food adverts for other reasons. The child stated that the footballers, Messi and M. Salah, were the reason for his liking the food advert. This indicates the appealing nature of TV adverts utilizing famous people. The participants' scores on knowledge of healthy diets ranged from 0 to 9, (5.44 ± 2.53).

Table 3: Frequency distributions of socio-demographic variables among the participants in the study (n = 86)

Variable	Frequency (%)
Demographic variables	
Sex	
Gils	45.3
Boys	54.7
Age in years	
10	38.4
11	23.3
12	20.9
13	15.1
14	2.3
Nationality	
Ugandan	94.2
Kenyan	4.2
Others	4.7
Other (Nationality)	
Sudanese	1.2
Rwandese	3.5
Tribe	
Muganda	41.9
Mutoro	12.8
Munyankole	11.6
Others	31.3
No response	3.5
Job of mother	
Businesswoman	64
Office Worker	22.1
Other	11.6
Non response	2.3
Have a television at home	
Yes	100
NO	0
Last time since watching Television	
Today	52.3
This week	26.7
This month	9.3
More than a month ago	9.3
Never	2.3
Time taken watching TV (n = 82)	
Less than 30 Minutes	3.7
30 minutes to 1 hour	14.6
More than 1 hour	6.1
More than 2 hours	75.6
Watching TV beyond 9:00 pm (n = 83)	
NO	22.9
YES	77.1
Seen a TV food advert (n = 84)	
NO	3.6
YES	96.4
Liked food advert (n = 82)	
NO	6.1
YES	93.9
Influence of food advert on Children (n = 82)	
Did nothing	22.0
Buy the food	17.1
Asked mom or dad to buy food(s) or drink(s)	56.1
Other	4.9
ANTHROPOMETRY (n = 85)	
BMI-for-age	
Underweight	3.5
Normal	83.5
Overweight	11.8
Obese	1.2

4.1.3. The most popular food adverts on television

Chip (55.8%), chicken (54.7%), ice cream (53.5%), pizza (23.3%) and rice (23.3%) were the top five self-reported foods of preference. The five most popular TV food adverts were for ice cream (40.2%), chips (36.6%), pizza (35.4%), soda (29.3%), and water (26.8%). Thus ice cream, chips and pizza were among the top five self-reported foods of preference and five most popularly advertised.

4.1.4. The influence of unhealthy food adverts on food choice

The mean score for unhealthy food preference was higher (19.13 ± 3.35) than that of healthy food preference (15.09 ± 2.88). The scores ranged from 10 to 23 and 9 to 24 for healthy and unhealthy food preference respectively. There was no significant difference by gender, $p > 0.05$.

Whereas having seen a food advert did not significantly influence unhealthy food preference in this population, length of TV exposure did significantly increase unhealthy food preference, $p < 0.01$. More than three-quarters (75.6%) watched TV for two or more hours.

Participants who watched TV beyond 9:00 pm had significantly higher unhealthy food preference (19.72 ± 2.89) than those who didn't (17.16 ± 4.29), $p < 0.05$, (Table 4).

Table 4: Selected characteristics of respondents (n = 83)

Characteristic	N	Mean	p-value*
Mean "Score of unhealthy Food Preference" by watching Television beyond 9:00 pm			0.022
NO	19	17.16	
YES	64	19.72	
Mean Body Mass Index by ever seeing a food(s) or drink(s) on television			0.037
NO	3	20.12	
YES	80	17.39	

**p-values were generated from independent sample t-tests.*

More than half (56.1%) of the participants reported coercing their parents to buy them advertised food with about 22% reported not being influenced by the adverts (Figure 2). Some of the children (17.1%) reported purchasing the advertised food(s). About 4.9% of the children reported other influences the adverts had on them which included emotionally feeling bad due to the adverts, increased salivation. Thus food adverts may not only influence purchasing choices but also children's emotions and physiology.

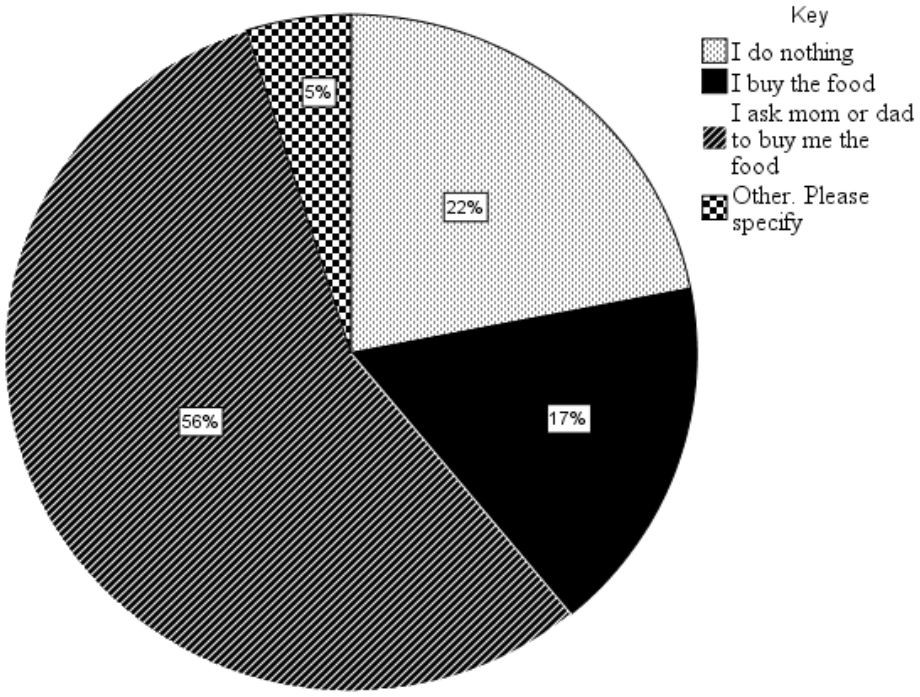

Figure 1: Influence of Television Food Adverts on Food choice

Participants who had reported ever seeing a food advert on TV indicated consuming the advertised food(s) mostly at home (63.0%), followed by restaurant (54.3%), school (8.6%) and Street (2.5%). About 1.2 % reported not consuming the advertised food(s). About 22.2% reported consuming the advertised foods in other locations which included beaches, parties, bars and relatives' homes.

It was found that those who had ever seen a television food advert had significantly lower Body Mass Index (17.39 ± 2.17) than those who had not seen a television food advert (20.12 ± 3.15), $p < 0.05$ (Table 4).

About 14.5% of participants had watched TV alone prior to the day of the study whereas more than three-quarters (85.5%) had watched TV with someone else (Table 5). Of the latter, more than half had watched TV with a sibling i.e. a sister (57.7%) or a brother (50.7%)). The impact of television advertising might be on more than one child in a family. Children watched TV with more mothers (49.3%) than fathers (29.6%). More mothers than fathers, are therefore likely to offer guidance on TV food adverts to children. About 14.1% reported watching TV with other people who included relatives and neighbors. Only 9.9 % reported watching TV with a house girl (maid).

Table 5: Audience when child watched Television (n = 71)

Individual with whom child watched television	Frequency (%)
Sister	57.7
Brother	50.7
Mother	49.3
Father	29.6
Friend	29.6
Other	14.1
Maid	9.9

4.2. DISCUSSION OF RESULTS

4.2.1. Children's Knowledge of unhealthy food marketing on television

This study showed that Ugandan children have considerable knowledge of food advertising on TV i.e. they know the nature of TV food adverts and those they find appealing. Television advertising's influence of increasing knowledge of unhealthy food adverts found in this study has been reported in other studies (Cairns, Angus, & Hastings, 2009; Boyland, et al., 2016). Much as knowledge of healthiness of diets was not assessed, it could not be determined if it was adequate to make health food choices.

There was a higher use of cartoons (39.7%) found in this population than that found by Kelly, et al. (2010) which was 23%. The difference may be due to less strict regulation cartoons for child targeted food advertising in the country. Palatability which comprises of the nice and yummy appearance of food (56.4%) was the most prominent persuasive marketing technique higher than the value (54.5) reported by Hebden, King, & Kelly (2011). Therefore, it is possible that palatability as a marketing technique is much more employed in Ugandan food advertising than in others. Much as Kelly et al. (2010) and Hebden et al. (2011) analyzed recorded television thus more accurate, this study measured actual recall of food adverts which may have contributed to the higher reported utilization of the marketing techniques - cartoons and palatability of food - in the study population .

4.2.2. The popular unhealthy food adverts on television

This study found that some of the most popularly advertised foods were also the children's self-reported foods of preference. This seems to indicate the influence of television food advertising on child food preference, which has also been found by other researchers (Garde, Davies, & Landon, 2017; Cairns, et al, 2012).

The popular TV food adverts were for foods or drinks high in saturated fats, salt and sugar. Mercer, Johnstone, & Halford (2015) also found that the majority of advertised foods were unhealthy in composition. It has been shown that, children in other populations have also been exposed to more TV advertising for unhealthy than healthy food items (Boyland, Harrold, Kirkham, & Halford, 2011). This study adds to growing literature supporting that argument and recommending

improvement of the quality of foods and drinks advertised to children. Increased exposure to unhealthy food adverts in this population therefore might have contributed to the most popular foods being those high in saturated fats, salt and sugar.

Different studies on the popularly advertised foods have utilized different food categorizations making them hard to compare. Rovirosa et al. (2017), in their study on the most popularly advertised foods, found products different from the ones found in this study. However, much as they used a different classification, they concluded that the popularly advertised foods were mostly unhealthy, a conclusion shared by this research. Therefore, future studies may find that the most popular food adverts are for products different from the ones reported here due to introduction of new food items or difference in geographical location. Though new product will arise or the same products are advertised, they may still be found to have unhealthy nutritional compositions.

4.2.3. The influence of unhealthy television food adverts on food choice

Unhealthy food preference in this population was increased by length of watching TV as well as watching TV beyond 9:00 pm, both of which may be attributed to increased exposure to food adverts. Hare-Bruun et al., (2011) also found that unhealthy food preference was influenced by length of watching television. Abideen & Salaria (2009) have also reported the dependence of the magnitude of TV influence on the duration of TV watching. This study add to growing literature recommending restriction of time children spend watching television.

This study showed that a Ugandan child is twice more likely to coerce a parent to buy a food seen on TV than buy it on his or her own. However, the options ‘coercion’ and ‘purchase’ used in this study were mutually exclusive thus it is possible that a child could both coerce a parent and buy a food item themselves. Goldstein (2016) and Huang (2016) have also reported the coercive effect of TV food adverts. The television influence on child purchases found in this study have also been reported by Abideen & Salaria (2009).

Ugandan children are more likely to consume the advertised foods at home rather than away from home, be it in a restaurant or at school. Thus, Ugandan children might consume advertised foods when they are available at home or when a parent is around to buy the food. Home was also found as one of the most common locations for consumption of unhealthy foods among children by other

researchers (Briefel , Wilson , & Gleason , 2009; Kerr , McCrorie , & Rennie , 2010). Much as Briefel et al. (2009) found home and school as the two most popular locations for consumption of unhealthy foods amongst children, this study found home followed by restaurant to be the most popular locations. This difference might indicate the lower purchasing power of Ugandan children compared to their American counterparts while at school. Powell & Nguyen (2013) and Robson et al. (2016) have reported the association between out-of-home eating and poor dietary impacts on children. Li et al. (2018) found that the choice of restaurants for family, especially low-quality full-service restaurants influenced body mass index. Li et al. (2018) further reported the increased need for public awareness of the importance of family restaurants as well as the potential unhealthiness of full-service restaurants. The findings of this study suggest need to understand the out-of-home consumption patterns and restaurant choices of Ugandan families. Overall it is shown in this population that the influence of television food advertising on child food choice may depend on availability of advertised food and location of food consumption, as indicated by Fitzgerald et al. (2010).

A study by Australian Communications and Media Authority (2015) found a correlation between the presence of an adult in the audience and the age of a child—adult supervision was 40% or fewer when a child was aged 10 years or older. Thus Ugandan children are more likely to watch TV with a mother (49.3%) as the adult in the audience, much more than their Autralian counterparts. Mothers might be able to offer guidance their children since they may be available during screentime. Also, they may be the ones to regulate screentime for children.

It could not be determined whether the children's knowledge of healthy diets was adequate to make healthy food choices. Even when children have the knowledge and desire to maintain a healthy diet, they may not make healthy food choices (Fitzgerald, et al., 2010). Mothers might be able to offer children nutritional knowledge.

In this study, those who reported ever seeing a TV food advert had a significantly higher Body Mass Index than those who did not. This is contrary to other studies (Huang, 2016; Bora et al., 2014; Costa, Horta, & dos Santos, 2012) and may be due to the small sample size in this study.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1. CONCLUSION

Ugandan children are knowledgeable of the unhealthy food adverts on television. The most popularly advertised foods on Ugandan television are ice cream, chips, pizza, soda and water. Therefore, most of the popularly advertised foods are unhealthy. The television adverts employ the same marketing techniques used in other populations. The techniques include use of cartoon characters, celebrity endorsement, music and the palatability (appearance) of the food. The most utilized marketing technique is cartoon characters followed by the palatability portrayed in the food adverts.

Watching television beyond 9:00 pm and length of watching television have both been found to be significantly associated with unhealthy food preference in this population. The location of consumption of food and availability of advertised foods have also been found to be associated with the consumption of the advertised foods. Most of the consumption of the advertised foods occurred at home and in restaurant. The most reported influence of television food advertising was coercion of parents to buy a food. Purchase of the advertised foods came second. Mother more than fathers are likely to watch television with a child thus may be more effective targets for interventions such as restriction of screen time and guidance of children when making food choices.

5.2. RECOMMENDATIONS

There is need for parental restriction of child screen time, especially not to go beyond 9:00 pm.

Parents need to be encouraged to give in to their children's purchase requests in moderation.

5.3. Limitations to the study

This study faced certain challenges. Access to participants was granted by the school for only one class-primary six. This prevented analysis on the basis of education level i.e. across classes. The sample used was limited to 86 children, from only one urban school in the whole of Kampala.

Thus the findings may not be generalized to other regions of the country. The school included in the study was a government aided school, which may have different results from private schools, especially socio-economically.

The exposure of children to food adverts from other sources such as billboards, were not taken into consideration.

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APPENDIX: QUESTIONNAIRE

TELEVISION MARKETING OF UNHEALTHY FOODS AND FOOD CHOICE AMONGST PRIMARY SCHOOL-AGE CHILDREN IN KAMPALA.

School: ……..

Identification Number	

Hello, I am Wontanga Emmy, a student of Makerere University. I'm conducting a study on how you watch television and how it affects your choice of food.

I have got permission from your teachers. I am asking for your permission to be part of this study. You are free to leave the study at any time. Your name will not be shared as all data will be reported as a group. This exercise is not a test and will not affect your grades.

CONSENT:

Do you agree to take part in this study? Put a circle around your response

1. NO, I do not agree to be part of this study
2. YES, I agree to be part of this study

Answer as honestly as you can. There is no wrong answer.

A. **DEMOGRAPHIC AND SELF REPORTED FOOD PREFERENCE**

a. How old are you?
   1. 10 years old
   2. 11 years old
   3. 12 years old
   4. 13 years old
   5. 14 years old

b. I am a
   1. Boy
   2. Girl

c. I am a
   1. Ugandan
   2. Kenyan
   3. Tanzanian
   4. Other. Please Specify ……

d. Tribe: ……..

e. I am in

1. Primary four	2. Primary five	3. Primary six	4. Primary seven

f. Job of parent (Mother)……

g. Name the food(s) or drink(s) you would like your mom and dad to buy for you today.
   1. ……
   2. ……
   3. ……
   4. ……
   5. ……

B. FOOD PREFERENCE					
Please put a tick on the face of your appropriate response					
How interested are you in eating or drinking the following foods or drink?					
	FOOD	Not interested	Not sure	Interested	Very Interested
1	**Raw or cooked cabbages with no oil**				
2	**Chips**				
3	**Jolly Jus or Pop Drink**				
4	**Water**				
5	**Yellow Banana**				
6	**Soda: Coca cola, Fanta, Mirinda**				
7	**Donut**				
8	**Cookies**				
9	**Carrots**				

10	**Porridge with no sugar**				
11	**Tea with sugar**				
12	**Tea without sugar**				

C. KNOWLEDEGE ON HEATHINESS OF DIET

For the pair of foods or drinks ("a" to "I"), indicate which food you think is good for your health.

A good food for your health is what doctors tell you to eat or drink.

Please, circle the food of your choice.

a.	1. Mango	2. Biscuit
b.	1. Soda	2. Water
c.	1. Yoghurt	2. Cake
d.	1. Gorillos or snack attack	2. Roasted Groundnuts
e.	1. Boiled maize	2. Snack attack
f.	1. Boiled egg	2. Rollex (Chapatti and fried eggs)
g.	1. Ice cream	2. Boiled Fresh Cow Milk
h.	1. Avocado eaten with salt	2. Avocado eaten with no salt
i.	1. Meat cooked at home	2. Muchomo

D. TELEVISION (TV) EXPOSURE, POWER AND EFFECT

a. Do you have a TV at home?

1. NO 2. YES

b. When was the last time you watched TV?

1. Never
2. Today
3. This week
4. This month
5. More than a month a go

IF RESPONSE TO QUESTION **b** IS **'NEVER'**, MOVE STRAIGHT TO SECTION **E**.

c. For how long do you watch TV?

1. Less than 30 minutes
2. 30 minutes to 1 hour
3. More than 1 hour
4. More than 2 hours

d. Do you ever watch TV beyond 9:00 pm? 9: 00 pm is time for news like NTV at 9, NBS at 9.

1. NO 2. YES

e. Remember the last time you watched TV. Who did you watch TV with?

1. Alone
2. With someone

IF RESPONSE TO QUESTION **e** IS **'ALONE',** SKIP QUESTION **f**

f. With whom did you watch TV the last time? (Please select all that apply)

1. With my brother	2. With my sister	3. House girl (Maid)
4. With my mother	5. With my father	6. With my friend(s)
7. Other. Please specify…….		

g. Have you ever seen food or a drink appear on TV?

1. NO 2. YES

IF RESPONSE TO QUESTION **g** IS **'NO',** MOVE STRAIGHT TO SECTION **E**

h. What food(s) or drink(s) did you see on TV? List as many as you can remember
   1. ……
   2. ……....
   3. ……
   4. ……
   5. ……

i. Did you like the food(s) or drink(s) you saw on TV?

   1. NO 2. YES

   IF RESPONSE TO QUESTION **i** is **'NO'**, SKIP QUESTION **j.**

j. What did you like about the food(s) or drink(s) you saw on TV? (Select all that apply)
   1. There was a cartoon with the food
   2. There was a nice looking boy or girl in the advert
   3. There was a nice song when I saw the food
   4. It looked nice and yummy
   5. Other, Please specify…….

k. What do you do when you see food or a drink on TV?
   1. I do nothing
   2. I buy the food
   3. I ask mom or dad to buy me the food
   4. Other. Please specify…….

l. Where do you usually eat the food or drink you see on TV? (Select all that apply)

   1. Home 2. On the street
   3. School 4. Other. Please specify……....
   5. Restaurant 6. I never eat the food or drink I see on TV

E. ANTHROPOMETRY.

	Measurement 1	Measurement 2
1. Weight (kilograms)		
2. Height (metres)		

Thank you for your participation in this study