ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTISE ABOUT PROCESSED SNACK FOOD AMONG ADOLESCENT OF SELECTED SCHOOL OF DHARAN, NEPAL.

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Assessment of knowledge, attitude and practice about processed snack food among adolescent of selected schools of Dharan, Nepal

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Approval Letter

This dissertation entitled ***Assessment of knowledge, attitude, and practice about processed snack food consumption among adolescent of selected school of Dharan*** presented by Nomita Bhattarai has been accepted as the partial fulfillment of the requirements for the bachelor's degree in science in Nutrition and Dietetics.

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Abstract

The aim of this research work was to access the knowledge, attitude and practice about packaged snack foods among selected schools of Dharan municipality A cross sectional qualitative study was carried out among 192 adolescents of age group 10-19 years of two different schools with structured questionnaire to access the knowledge, attitude, and practice of processed snack foods among adolescents of Dharan municipality. The schools and adolescents were selected on the basis of simple random sampling. The knowledge section comprised of 5 questions, attitude section comprised of 8 questions and practice section comprised of 9 questions. Knowledge, attitude and practice were categorized as adequate and inadequate on the basis of value lying below and above the median. Anthropometric measurements were used to determine BMI z-scores. Microsoft excel and IBM SPSS version 26 software were used for data entry and analysis. Chisqare was used to establish relationship between different variables under study.

The mean age of respondent was 13.72 ± 1.80. The study revealed that 57.3% of the study participants were male and 42.7% were Female. The study revealed that 41.7% had adequate knowledge whereas 58.3% had inadequate knowledge, 47.9% had positive attitude whereas 52.1% had negative attitude, 49% had good practice whereas 51% had bad practice regarding processed food consumption. The main factor driving the processed snack food consumption was its taste. The main consideration while buying processed snack food was its taste. The most preferred processed snack food was noodles. There was no significant association between knowledge score and practice score. There was no significant association between knowledge score and attitude score. Despite adequate knowledge and positive attitude every student practiced processed snack food consumption. More than half students had inadequate knowledge, negative attitude and bad practice which shows that there is lack of awareness about processed snack foods among adolescents. So, the government and schools should collaborate in creating awareness programs about processed snack foods to minimize consumption.

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List of abbreviations

Abbreviation	Full form
WHO	World Health Organization
PFC	Processed Food Consumption
DM	Diabetes Mellitus
RD	Registered Dietitian
KAP	Knowledge attitude practice
TFBs	Translational food and beverages

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Part I

1.Introduction

1.1 General Introduction

Adolescence is the period of development that begins at puberty and ends in early adulthood. It is characterized by rapid pace of growth that is second only to that of infancy. Adolescence is a significant period of physical, social, and emotional development, and is characterized by prominent neurobiological changes in the brain. Adolescents are nutritionally vulnerable due to their high requirements for their growth, eating patterns and their susceptibility to environment influences. Inadequate nutrition in adolescence can potentially retard growth and sexual maturation. Inadequate nutrition also puts adolescent at high risk of chronic disease although the detrimental effects appear after a long time. Adolescent diets are typically characterized by low intake of fruits and vegetables and higher intake of energy dense nutrient rich foods including sweet and salty items, sugar sweetened beverages and fast foods (Das, Salam *et al*., 2017) (Christian and Smith, 2018). Processed snack foods are generally energy dense food with high amount of refined sugar, white flour, trans-fat, polyunsaturated fat, salt, numerous additives and low nutrient value in terms of protein, fiber, vitamin, and mineral content (SD *et.al*., 2017). Foods commonly considered processed snack foods include Noodles, Chips, Donuts, Pastries, Cold drinks, biscuits and ice cream. Consumption of poor-quality diet including packaged snack food is associated to a higher risk of obesity, heart disease and stroke, digestive issues, diabetes, cancer, and early death (Subedi, Nayaju *et al*. 2020). A study by Paul Johnson and Paul Kenny at the Scrips Research Institute in 2008 suggested that processed snack food consumption alters brain activity in a manner similar to addictive drugs like cocaine and heroin.

Poor nutrition and eating habits at any stage of the adolescence can have lasting consequence on an adolescent's cognitive development, resulting in decreased learning ability, poor concentration, impaired school performance, stunting, thinness, micronutrient related deficiency, obesity and increased risk of chronic lifestyle disease in the future, which can have lasting impact on adolescents' future. Adolescent Nutrition survey in Nepal 2014 revealed that 71% of male adolescents and 59% of female adolescent were undernourished

and majority of adolescents (94%) reported that they usually eat packaged or processed food (Aryal *et al*., 2016).

1.3 Statement of problem and justification

Globally, processed snack foods are popular stuff, and consumption is increasing constantly. Traditional foods have been nearly replaced by food items that can be found in a state of ready to eat, in canned form, and preserved for a longtime (Preuss and Bagchi ,2020). Packaged food consumption and its consequences has become a major public health concern globally because of its deteriorating health consequences and surging prevalence. Though its adverse health consequences are widely prevalent in all age groups, children and adolescents are more at risk (Bohara, Thapa *et al*. 2021). Energy dense processed snack foods can have a detrimental effect on levels of energy and mental wellbeing and keep adolescents at high risk of chronic disease according to WHO. Consumption of large quantities of packaged ready to eat snack food is associated with drastic reduction in consumption of nutritious foods such as milk, fruits and vegetables (Laxer and Janssen, 2014).

Adolescence is the only time following infancy when the rate of physical growth increases. This sudden growth spurt is associated with hormonal, cognitive, and emotional changes that make adolescence an especially vulnerable period of life. First, there is a greater demand for calories and nutrients due to the dramatic increase in physical growth and development over a relatively short period of time. Second, adolescence is a time of changing lifestyles and food habit changes that affect both nutrient needs and intake. Third, adolescent drive for individuation means more opportunity to assert food choices and expand or narrow healthy options. Poor nutrition during adolescent period can have lasting consequences on an adolescent's cognitive development, resulting in decreased learning ability, poor concentration, and impaired school performance (Das, Salam et al. 2017).

Despite the socioeconomic condition of the family, packaged ready to eat snack food consumption has been emerging worldwide due to quick consumption, ready to eat, inexpensive, and of good taste (Gulati and Misra, 2017). The important factors to packaged food consumption are nuclear family, advertisement, working mother, socioeconomic status

and easy access to fast-food shop, food taste, variety of choice and quick service in the shop (Subedi, Nayaju et al. 2020).

In different surveys conducted in various parts of Nepal it was found that almost every school going student practiced processed food consumption (Subedi and Nayaju, 2020) (Das and Salam, 2017). Increasing prevalence shows there is some fault in knowledge, attitude and practice of energy dense processed food consumption. Hence, this study aims to identify the gaps between knowledge, attitude, and practice of packaged snack food consumption to create awareness among people and policy makers. This study will assess the correlation between knowledge and practice and find the gap between them. So that it helps in strategy making at a policy level to prevent complication due to processed snack food consumption among adolescents.

1.3 Objectives:

1.3.1 General objectives:

a) To assess knowledge, attitude with practice of processed snack food consumption among adolescents.

1.3.2 Specific objectives:

a) To access the level of knowledge and attitude regarding processed snack food among adolescents.

b) To access the practice of processed snack food consumption among adolescent.

c) To find correlation between knowledge and practice of processed snack food consumption among adolescents.

d) To compare knowledge with attitude about processed snack food consumption among adolescents.

e) To find association between BMI and factors (Knowledge, attitude and practice).

1.4 Research questions

a) What is the level of knowledge, attitude and practice regarding processed snack food consumption?

b) What are the factors influencing processed food consumption among adolescents?

1.5 Significance:

a) The study may be useful to prepare a nutritional policy to improve the nutritional status of adolescents in school.

b) The study will help us to know the factors influencing processed snack food consumption.

c) The study will help us to know knowledge, attitude and practice regarding processed snack food.

d) The study will help us to know about the most preferred processed snack food.

1.6 Limitations:

a) Counselling and knowledge weren't provided.

PART II

Literature review

2.1. Adolescent

Adolescence is the phase between childhood and adulthood (10-19yrs). It roughly coincides with puberty. Adolescence can be divided into three stages. Early adolescence (11-14 years of age) is characterized by the onset of puberty and increased cognitive development. Middle adolescence (15-17 years of age) is characterized by increased independence and experimentation. Late adolescence (18-21 years of age) is a time for making important personal and occupational decisions (Salmela and Aro, 2011). Poor nutrition during any of these stages can have lasting consequences on an adolescent's cognitive development, resulting in decreased learning ability, poor concentration, and impaired school performance.

It is a significant period of physical, social, and emotional development, and is characterized by prominent neurobiological changes in the brain (Reichelt and Rank, 2017) Adolescence represents a key period of brain development underpinned by the ongoing maturation of the prefrontal cortex—a brain region involved in the regulation of behavior and cognition (Lowe and Morton, 2020).The maturational processes that occur in brain regions responsible for cognitive control and reward seeking may underpin excessive consumption of palatable high fat and high sugar foods during adolescence (Stuckler and McKee, 2012).

Adolescence is a window of opportunity to influence eating patterns and nutritional status, which can have a lasting impact on future health outcomes. Adolescent diets are typically characterized by low intake of fruits and vegetables and higher intake of energy dense nutrient foods including sweet and salty items, sugar sweetened beverages and fast foods (Keats and Rappaport, 2018) (Akseer and Al-Gashm , 2017). Poor eating habits during adolescence can lead to obesity and diet related diseases in later years.

2.2. Processed snack food

Processed snack food is a derisive slang term for food that is of little nutritional value and often high in fat, sugar, salt, and calories. Unhealthy processed snack foods typically contain high levels of calories from sugar or fat with little protein, vitamins or minerals (Pahari and

Baral, 2020). It is also known as HFSS (high fat, sugar or salt). The most consumed processed snack food items are bakery products, beverages, caffeinated drinks, chips, chocolates, noodles, pizza, soft drinks, and sugar sweetened drinks.

Globally, processed snack foods are popular stuff, and consumption is increasing constantly. Traditional foods have been nearly replaced by food items that can be found in a state of ready to eat, in canned form, and preserved for a longtime (Mukhopadhyay and Goswami, 2020). The consumption of processed snack food has peaked in developed countries; however, there is increasing trend in the developing countries of the world (Kearney *et al*., 2010), and this trend is most alarming in low-and-middle-income countries (Saha and Al Mamun, 2022).

Processing can result in modified structural properties of the food that lead to higher glycemic response and lower satiety signals and the use of certain industrial ingredients cn result in gut microflora dysbiosis, increased gut permeability and inflammation (Augustin and Riley, 2016).

Globally, it was found that 41 million children and adolescents were the victims of obesity as a result of processed food in 2016. PFC and its consequences have become a growing public health concern (Bohara and Thapa, 2021). There is growing evidence that PFC is a leading cause of preventable diet related diseases and untimely deaths (Vignola and Nazmi, 2021). Premature deaths and preventable illnesses from diet related non-communicable diseases have also increased substantially around the globe, including in Nepal (Gupta*et al*., 2018) (Neupane *et al.,* 2014). It has negative health consequences for people of all ages and school children and teenagers are particularly more vulnerable (Neupane *et al* .,2014). These days, young people's nutritional behaviors have shifted away from homemade staple foods to industrially processed food (Bohara and Thapa, 2021) (Upreti and Bastien *et al*., 2021). Particularly, unhealthy processed snack food has become a common snacking practice among SCA in Nepal (Neupane *et al*., 2014) (Poudel and Tiraphat, 2018) (SD 2017) (Upreti and Bastien , 2021).

2.3. Factors influencing processed snack food Consumption.

2.3.1. Taste:

A wide range of studies shows that food liking is one of the most important driver of food consumption (Tuorila and Huotilainen, 2008). Food liking includes liking of basic qualities (e.g., sweet, sour, bitter, salty, spicy and fat) (Tuorila and Huotilainen, 2008) (Keast and Costanzo 2015) (Running, Craig et al. 2015). Most processed food contains abundance amount of sugar, fat and sodium. Sugar, fat and sodium significantly impact the taste profile of food (Beauchamp and Cowart 1987) (Drewnowski *et al*., 1997) (Dötsch and Busch, 2009). In different studies conducted in different parts of Nepal it was found that main factor influencing processed food consumption was taste factor (Subedi and Nayaju, 2020) (Acharya and Pahari, 2021).

2.3.2. Time:

Processed snack food and fast food are all definitions that have been used to describe the quick, unhealthy, hunger satisfying foods, which are easy to make and easy to consume (Vinay Gopal and Sriram, 2012) (Dehdari and Chegni, 2013). Unhealthy processed snack food addiction is high because of its simplicity. They are easy to prepare and very tasty. People can save a lot of time when they are in hurry by consuming processed snack food.

2.3.3. Advertising:

There is strong evidences that food advertising influences children's food preference, purchase and consumption (Lotfi Mainbolagh and Rakhshani, 2012) (Scully, Wakefield et al. 2012). Processed snack food advertising promotes processed snack food products and utilizes numerous aspects to reach out to the public. Marketing strategies particularly target children's because they are easy and potential targets for unhealthy packaged snack food. Researchers at McMaster University, in Canada, accesses 17 studies that examined the effects of unhealthy foods and drinks marketing found that the ads increased the amounts of calories kids ate and their preference for unhealthy food shortly after they viewed the commercials. Similarly in different studies conducted in different parts of Nepal it was found that advertisement of processed snack food promoted its consumption (Gautam and

Sciences 2021) (Pahari and Baral, 2020) (Singh and Gautam, 2020) (Subedi and Nayaju, 2020) (Bohara and Thapa , 2021) (Upreti and Bastien,
2021) (Upreti and Acharya, 2022).

2.3.4. Cost:

The cost is less as compared to healthy food. Less cost is also a big reason of the popularity of processed snack food. It is accessible to all classes of population due to its low and attractive price range.

2.3.5. Variety:

Processed snack food has crunchiness, juiciness and creamy textures, as well as flavors that include salty, sweet and 'umami '(a special flavor described as salty), which provides a wide variety of stimulating and pleasurable sensations in the mouth of those who consume it (Jacobs and Richtel, 2022).

2.4. Harmful effects of Processed snack food

2.4.1. Obesity

Overweight and obesity are defined as abnormal or excessive fat accumulation that presents a risk to health. A body mass index (BMI) over 25 is considered overweight, and over 30 is obese. The issue has grown to epidemic proportions, with over 4 million people dying each year as a result of being overweight or obese in 2017 according to the global burden of disease. From 1975 to 2016, the prevalence of overweight or obese children and adolescents aged 5–19 years increased more than four-fold from 4% to 18% globally according to WHO (WHO, 2024).

Obesity in childhood is associated with a wide range of serious health complications and an increased risk of premature onset of related illnesses. Studies have found that without intervention, children and adolescents with obesity will likely continue to be obese into adulthood according to WHO (WHO, 2024).

Several dietary factors inherent to processed snack food may cause excessive weight gain such as massive portion size, high energy density, palatability (appealing to primordial taste

preferences for fats, sugar, and salt), high content of saturated and trans-fat, high glycemic load, and low content of fiber (Monteiro et al., 2010).

A population-based study in Korea showed that fast food consumption was linked to metabolic syndrome in adolescents. The study demonstrated that sweet dietary habits were positively related to metabolic syndrome, and those under processed snack food consumption were more likely to be overweight. Processed foods are found to be associated with obesity due to their high energy content and the amount of fat present or free sugar, chemical additives, and sodium with the presence of a low number of micronutrients and fiber. Among processed foods, intake of sweetened beverages is in close relationship with weight fluctuations as it can increase food intake through decreasing satiety mechanisms. High consumption of Junk Foods contributes to the overweight among School-aged children in India from 9.7% to 13.9% over a decade (Ranjani and Mehreen , 2016).

Studies conducted in different parts of Nepal found that processed food consumption and sedentary lifestyle linked to overweight and obesity among children (Karki and Shrestha, 2019) (Poudel and Sciences, 2018).

2.4.2. Diabetes mellitus

Diabetes is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces resulting in high blood sugar. Insulin is a hormone that regulates blood glucose. Diabetes mellitus is of two types, Type-I (insulin-dependent) and Type-II (non-insulin dependent). The international federation report 2017 suggested that 451 billion adults globally had diabetes mellitus in 2017, and 693 million individuals are expected to suffer from diabetes mellitus by 2045. The world health organization estimates that more than 19% of the world's total population will suffer from DM by the year 2030 (WHO, 2024).

Processed snack foods are usually high in calories, fat, sugar, salt and low in useful nutrients such as vitamins, fiber, minerals and protein. As processed snack foods are low in fiber and high in carbohydrates, their glycemic index is high which means they provide a quick rise in blood sugar. Frequent spikes in blood sugar may be a contributing factor in

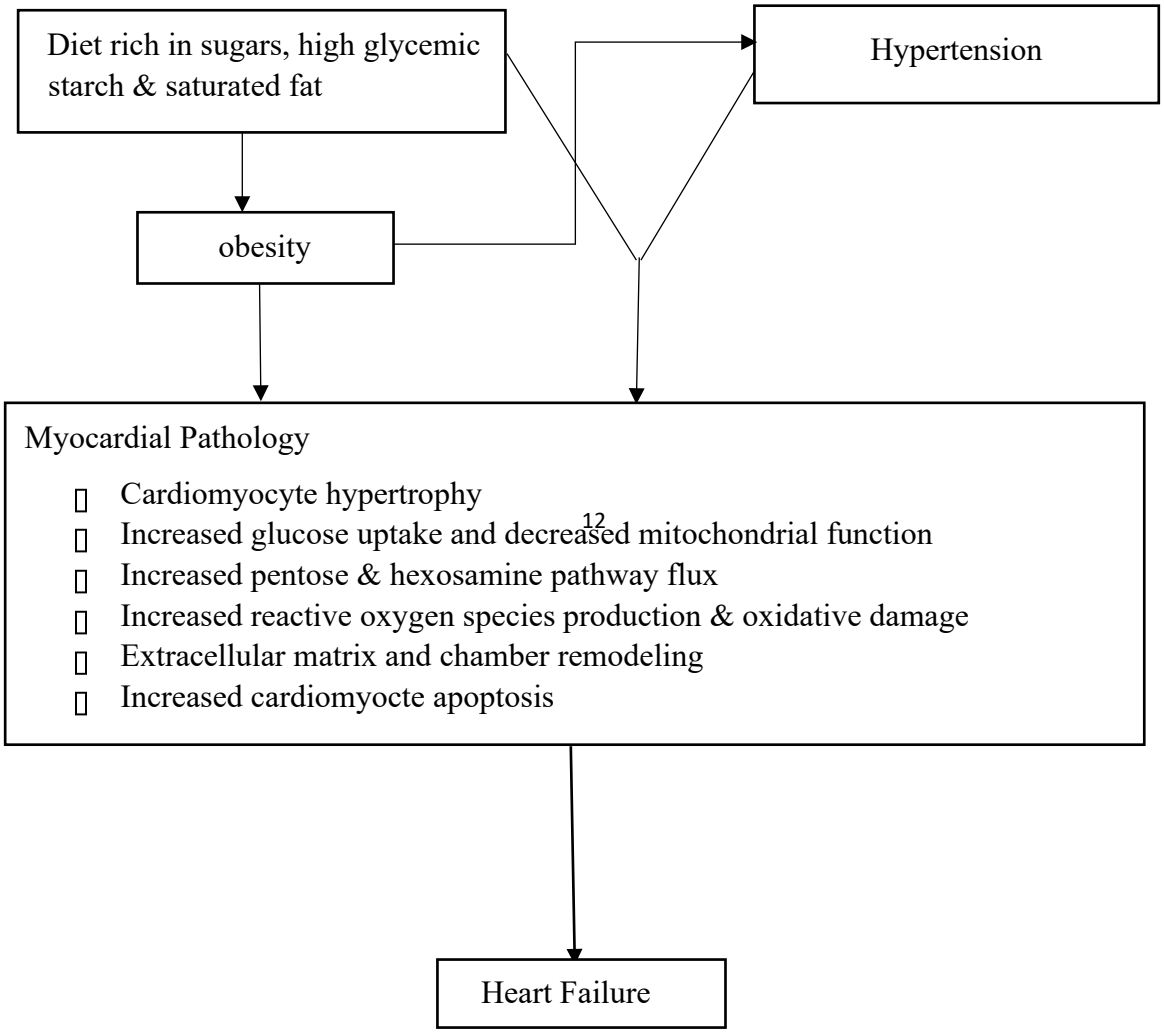
the development of insulin resistance and type 2 diabetes. As processed snack foods are low in fiber and protein it doesn't provide satiety, so people need to consume more amount in order to feel satiated which leads to consumption of more calories in small volumes Excess calorie consumption leads to obesity. The cellular and physiological mechanisms responsible for obesity and diabetes mellitus are complex. Obesity causes insulin resistance through adipose organ dysfunction and altered metabolic processes and leads to diabetes mellitus (Wondmkun and Obesity, 2020) (Ahmed and Sultana, 2021).

2.4.3. Heart Diseases

Heart disease describes a range of conditions that affect the heart.

Processed snack food diet is a major cause of heart disease, myocardial infraction, and severe heart failure due to plaque formation in arteries. Most clinicians recognize that peocessed snack food consumption is associated with premature heart disease. The consensus is that this relationship can be explained by the saturated fats in these foods increasing obesity, diabetes and hyperlipidemia risk and the high salt content raising blood pressure. A positive relationship between sodium intake and blood pressure (BP) has been documented in hypertensive and normotensive individuals (Bhaskar and Therapeutics, 2012). A typical processed snack food diet triggers multiple steps that eventually converge to accelerate the onset of heart failure (Abel and Litwin, 2008). Excess calorie intake results in obesity that is closely linked to myocardial structural and functional changes. For e.g.: increased left ventricular mass, that frequently results in heart failure. A large community-based study found that obesity is an independent risk factor for the onset of heart failure. There is also a robust relation between obesity and the development of hypertension, that is increased sympathetic activity plays a crucial role in obesity induced hypertension and could raise arterial pressure by causing peripheral vasoconstriction and by increasing renal tubular sodium retention (Rahmouni and Correia, 2005). Hypertension itself is also an independent risk factor for the onset of contractile dysfunction and heart failure. A high glycemic load enhances myocardial glucose uptake by increasing insulin and lowering plasma free fatty acids, which may stimulate re flux through the hexosamine and pentose pathways, and generation of reactive oxygen species and oxidative damage (Chess and Stanley, 2008) (Chess *et al*., 2008). A Higher rate of cardio myocyte apoptosis

in healthy rats fed a high fat diet composed of saturated fatty acids compared with a diet rich in mono saturated and polyunsaturated fats (Okere and Chandler 2006). Consumption of high glycemic / high saturated fat diet by hypertensive individual may thus further exacerbate pathological processes in the myocardium causing systolic and diastolic dysfunction and triggering the progression to heart failure. The picture below shows multiples step that accelerate the onset of heart failure.



2.4.4. Central nervous system

Some properties of processed snack food including its energy density, glycemic index and fatty acid composition induces hyperinsulinemia and development of insulin resistance both peripherally and centrally. Hyperinsulinemia is a primary initiator of insulin resistance, which may be in part responsible for leptin resistance. This promotes reduced energy expenditure and continued food consumption which may be in part responsible for leptin resistance. Leptin acts on receptors in the lateral hypothalamus to inhibit hunger and the medial hypothalamus to stimulate satiety. So, leptin resistance causes brain to miss this signal and ultimately leads to obesity (Isganaitis and Lustig, 2005).

A robust literature demonstrates the involvement of mesolimbic and mesocortical dopamine transmission in the responses to food consumption and food related behaviors. In particular DA transmission shows an adaptive response to highly palatable food consumption preferentially in the Nucleus Accumbens shell (NACS) a palatable a mesolimbic dopaminergic terminal area. Furthermore, other neuronal systems and homeostatic homeostatic hormonal and non-hormonal signs are involved in the modulation of rewarding or incentive properties of food and most of them seem to converge on the mesolimbic dopaminergic system (Bassareo and Gambarana, 2019).

The potential capability of sugar to induce addiction like behaviors has been well described and analyzed. The authors illustrated their elegant animal model for sugar addiction satisfied many of the criteria for "substance use disorder" reported in the diagnostic and statistical manual of mental disorders, fifth edition. According to the model rats develop a binge like pattern of sugar intake and show behaviors similar to those observed in response to drugs of abuse i.e. Craving and withdrawal signs and other neurological similarities was observed between rat's dependent on drugs of abuse and sugar, supporting the hypothesis that highly palatable foods hijack the systems that control responses to rewards, similar to what drugs abuse do.(Wiss, Avena et al. 2018). Dr. Nicole Avena who is the professor of Princeton university did experiment titled "Sugar; Bienging in rats " along with her two other friends . In the experiment she gave sugar water instead of water to the rats. She found out that the stress levels in rats increased and they also started to consume 3 to 4 times more sugar water compared to normal water. After the interval of a few days, she again gave them normal water instead of sugar water. When rats were given normal water, they refused to take normal water and also showed withdrawal symptoms similar to alcohol and drug withdrawal syndrome. After the interval of a few days when they were reintroduced to sugar water, they started to consume more water than before (M. Avena and Rada, 2006). Like Sugar, Processed snack food diets can also modify several aspects of motivated behaviors such as food seeking and consumption. In rats, 6 weeks of junk food exposure disrupted the ability to choose which food on the basis of expected value and availability predicted by conditioned cues. The authors hypothesize that rats given extensive junk food exposure acquire a persistent expectation of having access to junk food and this influences decision making about other food seeking actions.

They concluded that repeated junk food consumption induces long lasting impairments of behavioral control system that regulates energy balance and nutrition diversity, which contribute to overweight and obesity in humans (Kosheleff and Araki, 2018).

2.5. Anthropometry

Anthropometric measurements include height, weight, skin-fold thickness, and circumference etc., could detect the change of body composition to assess the nutritional status in specific population groups, including newborn, children under age of five and adults (Shrivastava *et al.*, 2014).

	Cutoffs	Indicator	
		Height for age	BMI for Age
Z- score range	Below -3 SD	Severely stunted	Severely thin
	-3 SD to -2 SD	Moderately Stunted	Moderately thin
	-2 SD to 1 SD	Normal	Normal
	+1 SD to +2 SD	Normal	Overweight
	+2 SD to +3 SD	Normal	Obese
	Above +3 SD	May be abnormal	Severely Obese

2.6. Trends on processed food consumption

Basic food processing has played an important role in human nutrition since the use of fire began between 1.5 and 2 million years ago (Cordain and Eaton, 2005) (Pollan *et al*.,2014) (Ulijaszek, Mann *et al*. 2012). The conversion of foraged and cultivated foods into more palatable, safe, nutritious and durable forms through for example, heating, cutting, grinding, drying, salting, fermenting and smoking enabled hunter gatherers to thrive across many ecological zones. The processing of food as practiced by hunter gatherer in itself is not detrimental for health. Advances in food processing have helped to improve worldwide food security by reducing the perishability of foods (Augustin and Riley, 2016). Since, the since the establishment of World Trade Organization in 1990s many countries have unilaterally liberalized their economics become more integrated into the global economy and this deregulatory Markets. This has accelerated the globalization of food systems by reducing barriers to the movement of finance and technologies. Production capacity, raw materials and final products across borders, especially enabling transitional food and

beverage cooperation, to easily enter and drive consumption within emerging markets and connect these markets to global supply chains (Hawkes *et al*., 2005) (Hawkes *et al*., 2006, Thow and Hawkes 2009, Baker and Kay, 2014). Some TFBCs had presence in Asia for over a century. For example, Coca-Cola entered the Philippines in 1912. Many domestic markers have been targeted with the Vigor since the 1980s. Given their high economic growth rates, rapid. Urbanizing lifestyle, young and growing populations and adoption of export laid growth strategies favorable to foreign market investment (Baker and Kay, 2014, Baker and Friel, 2016).

A shift towards processed food consumption can also be termed as nutrient transition. A "nutrition transition" has been identified in many low and middle income countries where by as nation experience economic growth diet patterns tend to move away from traditional diets towards Westernized diets including high intake of animal sourced food, added sugars, fats and refined carbohydrates (Popkin and Adair, 2012). Research shows that ultra processed food intake and beverage sales have rapidly increased in central and East Asia, North Africa and the Middle East and South and Southeast Asia regions where per capita income has rapidly grown in recent decades (Baker and Friel 2014, Baker and Kay, 2014). In Nepal, the process of nutrient transition began in 1980s following urbanization and the reason to open the economy of globalization and agricultural trade liberalization (Khadka *et al*., 1988, Pingali *et al*.,2007). The key driving factors of nutrients transition are rapid urbanization, growing number of women participating in formal work, integration into global economy, super marketization of the region, mass media advertising and tourism (Subedi and Marais, 2017, Baker and Machado, 2020).

In context of Nepal history, Him Shree food claims to be the first company to manufacture Instant noodles. Out of all the SAARC countries in 1979. Its most popular brand, Rara, is a white floor stand noodle, a staple widely distributed throughout the world under various brand name. Chowdhary group in 1984 introduced wai- wai which was the copy of Thailand based brand meaning Fast, fast in Thai, created by Thai preserved food factory (contributors 2023). The Coca cola was introduced to the Nepalese market in 1973 by importing from India . In 1979 the local production of Coca Cola started in Nepal. As of 2020, the production is run by publicly listed company, bottlers Nepal (Contributors, 2023).

2.7. Literature review on knowledge, attitude, and practice of processed food

Studies similar to this current study were done and aimed at evaluating the knowledge attitude and practice about Junk food. The KAP study on Junk Food Consumption in a random sample of 367 student studying in different educational institution showed that around half (45.2%) had poor level of knowledge, and only 19.1% of respondents had adequate knowledge regarding harmful effects of junk food consumption. All respondents had practice of junk food consumption (Subedi *et al*., 2021).

A descriptive cross-sectional study entitled "Awareness and practice of junk food consumption among secondary level students" was conducted among 237 adolescents of secondary level. The findings showed that 679% had moderate level of awareness, 24.1% had inadequate level and few (8.0%) had a high level of awareness. 50.6% of respondents had a low practice of consuming junk food whereas nearly half (49.4%) had a high practice of consuming junk food (Sapkota & Neupane, 2018).

A study entitled "Effect of education intervention program regarding knowledge, attitude, and habits of junk food among primary school students in Egypt showed that 83% had unsatisfactory knowledge and 17% had satisfactory knowledge, 67% had negative attitude whereas 33% had positive attitude, 92% had inadequate practice whereas 8% had adequate practice post intervention regarding junk food (Elbastawey *et al*., 2022).

A study entitled "knowledge, attitude, and practice of junk food consumption among university students of Delhi/ NCR India was done which showed that 50.4% had inadequate knowledge, 49.6% showed adequate knowledge, 52.3% had poor attitude and 47.4% had good attitude regarding junk food consumption (Tanveer and Tuba, 2020).

PART III

Materials and Methods

3.1. Study area

The study was carried out in Dharan municipality. Dharan is a sub-metropolitan city in sun sari district of Koshi Province, Nepal. Dharan has an estimated city population of 173,096 living in 34,834 households as per the 2021 census.

3.2. Study population

Adolescent of 10-19 years of age studying in private schools of Dharan, Nepal.

3.2. Selection Criteria

a) Inclusion criteria:

- Adolescents studying in private school Dharan municipality of age between 10-19 years of age were included in the study.

b) Exclusion criteria:

- Adolescents who were not fit physically and mentally.
- Adolescents who were not available at school during the time of survey.
- Those unwilling to participate in the survey.

3.4. Research design

A cross-sectional survey was conducted to assess the knowledge, attitude and practice associated with processed snack food consumption among adolescents studying in two selected private schools of Dharan municipality which includes:

a) Semi structured questionnaire

b) Anthropometric measurements of the population: Height, weight, BMI

3.5. Sampling Technique

- The schools was selected by simple random sampling.
- All the students studying in grade 6-10 of two schools were selected for the survey.

3.6. Sample Size

The calculation of sample size was calculated by using the statistical formula: Sample size(N)

$= z2 \times p(1-p)/d2$

Where, z =confidence interval at 95 % (standard value of 1.96)

p =estimated prevalence junk food consumption in project area

d=margin of error (7.5%)

Assuming the prevalence rate of processed snack food

consumption to be 50%

i.e. p=0.94, (1-p) =0.5

Now, N= (1.96)*2 x 0.5 x 0.5 /(0.075)*2= 170.73 ~ 171

Then, adding nonresponse rate of 10%, sample size was calculated to be 189.

3.7. Research Instrument

The study questionnaire was designed based on extensive literature review of previously published studies (Saeed and Janardhanan, 2020) (Subedi et al., 2021) (Sapkota & Neupane, 2018). The questionnaire is comprised of 3 sections.

The first section included 5 questions regarding knowledge and responses were based on Yes and No. An "incorrect" or "no" answer was given 0 point and 1 point was awarded for correct answer, giving a possible score ranging from 0 to 5. Using the measures from other study (Saeed and Janardhanan, 2020) knowledge was categorized as adequate and inadequate on the basis of value lying above median and below median.

The second section comprised 8 questions to evaluate students' attitudes towards junk food. The response to each item was indicated on a five point Likert scale as follows: Strongly agree (5 point), Agree (4 point), Neutral (3 point), Disagree (2 point) and strongly disagree (1 point) ; thus possible score ranged from 20-35. Using the measures from other study (Saeed and Janardhanan, 2020), overall attitude was classified as positive and negative attitude on the basis of value lying above and below the median.

The third section comprised 9 questions to evaluate students' practice towards junk food. Responses for 8 questions were based on yes, no, sometimes. Practice scores ranged from 1 to 3. Score were given for positive question as yes (3 point), sometimes (2 point), no (1 point),

whereas negative questions were ranked as yes (1 point), no (3 point) and sometimes (2 point). Response for 1 question was based on everyday (1 point), 5 times a week (2 point), 3 times a week (3 point), once a week (4 point). Using the measures from other studies (Saeed and Janardhanan, 2020), overall practice was categorized as good practice and bad practice based on value lying below and above median score.

The tools and equipment used for conducting the survey are:

a) Weighing Machine: - Crown classic weighing machine with the capacity of 130 kg and having the least count of 0.1Kg was used (1 piece).

b) Height measuring scale (Stadiometer): - The wooden plank stadiometer with the maximum capacity of 197cm and having the least count of 0.1cm was used (1 piece).

c) Questionnaire: - A well designed structured and pretested set of questionnaires was used .

3.8. Study Variables

3.8.1. Independent Variables

i) Socioeconomic and demographic variables: Chronological age, ethnicity, religion, marital status, occupation, education, parity, family size, income

3.8.2. Dependent Variables

i) Knowledge: Knowledge is an awareness of facts, a familiarity with individuals and situation or a practical skill.

ii) Attitude: Attitude is a summary evaluation of an object or thought.

iii) Practice: Practice refers to action rather than thought or ideas.

3.9. Pretesting

Pretesting of questionnaire and equipment's was conducted among a few students to determine whether the tool was efficient and viable. Following pretesting, any confusing, deceptive, and incorrectly understood questions were removed, and questionnaires were updated in accordance with the findings of pre-testing.

3.10. Validity and Reliability

The degree to which the data gathering tools will measure what they were intended to measure is referred to as validity. The questionnaire was developed after extensive review of different literature on a similar topic. The guide teacher was asked to validate the questionnaire. Pilot survey was done on subset of the study population. By comparing the data produced by the weighing balance with standard weights, the validity of the weighing balance was determined. To verify the data, the instruments were checked and reset each day.

Reliability is a term for the quality assurance test of the gathered data. In order to assess the validity of the questionnaire's content, a pretest was conducted before data collection. Daily checks were made to ensure the questionnaire was accurate, consistent, and understandable to respondents. To check whether different tools consistently produced the same findings, the trial method was employed.

3.11. Data collection technique

Data on the month of December 2022, was gathered in 2 steps. Prior to data collection, the respondents were greeted first and an informed consent was obtained after explaining the purpose of study. The respondents were first explained about the questions regarding socio demographics, knowledge, attitude and practice and were asked to fill up the questionnaire by themselves in presence of researcher, teacher and research assistants. Anthropometric measurement was filled up by researcher and research assistant after individually measuring height and weight of the study participants.

3.12. Data Analysis

The questions were reviewed at the end of each day to make sure they were accurate and clear to respondents following each interview. Data were coded manually and entered into SPSS Statistical analysis was performed using spss version 26 and 29. Descriptive statistics was used for calculation frequencies, means and percentages. Correlation, regression and chi-square was used to establish association between dependent and independent variables.

3.13 Logical and ethical consideration

Permission to conduct survey in two different schools was obtained from the principal of two schools i.e. Navodaya vidya mandir and Mount Moriah high school. Verbal and written consent from all the participants was obtained and the objective of the study was explained lucidly to them. Privacy and confidentiality of collected information was ensured at all level.

PART IV

Result and Discussion

The cross-sectional study involving 192 students aged 10-19 years who resided in Dharan was carried out to access the level of knowledge, attitude and factors among them using semi structured questionnaires. The results are explained under the following headings.

4.1. Demographic and socioeconomic characteristics

The information on socioeconomic and demographic characteristics is shown below.

4.1.1. Age distribution of population

The average age of respondents was 13.72 ±1.80, with half (50.5%) belonging to age group 13-16 years followed by almost half (45.3%) belonging to age group 10-13 years and remaining 8% belonging to age group 16-19 years. Distribution of study population by age is shown in Table 4.1.

Table 4.1: Shows the distribution by the age of the respondents (n=192)

Variables	Frequency	Percentage
Age		
11-13	87	45.3
14-16	97	50.5
17-19	8	4.2

4.1.2. Religion and caste distribution of population

Hindus comprised 77.6% of the total study participants (149) followed by Buddhists with 7.8% (15), Christian with 3.1% (6), Muslim with 0.5% (1), others with 10.9% (21). On the other side, Jana Jati had the biggest percentage of the ethnic group, accounting for 76.0% (146) of the total, followed by Chhetri 9.9% (19), Brahmin by 8.3% (16) and Dalit by 5.7% (11). Distribution of the study population by ethnicity and religion is shown below in Table 4.2.

Table 4.2: Distribution by the religion and ethnicity of the respondents.

Factors	Frequency	Percentage
Religion		
Hindus	149	77.6
Buddhist	15	7.8
Christianity	6	3.1
Muslim	1	0.5
Other	21	10.9
Ethnicity		
Jana Jati	146	76.0
Chhetri	19	9.9
Brahmin	16	8.3
Dalit	11	5.7

4.1.3. Sex of the study population

57.3% of the study population were male and 42.7% were female. The distribution of population by sex is shown in below in Table 4.3.

Table 4.3: Distribution of population by sex.

Variables	Frequency	Percentage
Sex		
Male	110	57.3%
Female	182	42.7%

4.1.4 Socioeconomic status of the population

In this study, it was found that 30.2% (58) of study participants mother completed Secondary level education followed by 26.6% (51) completed primary level education, 19.8% (38) were general literate, 16.1% (31) completed higher secondary education, 5.7% (11) Completed bachelor and above. Similarly, 34.9% (67) of study participants Father Completed secondary level education followed by 21.4% (41) Completed Higher secondary education, 15.1% (29) completed primary level education ,15.1% (29) completed general education and 12% (23) completed Bachelor and above. The socioeconomic status of the population is given below in Table 4.4.

Table 4.4: Distribution of population by socioeconomic status

Variables	Frequency	Percentage
Mothers' education		
General literate	38	19.8
Primary education	51	26.6
Secondary level education	58	30.2
Higher secondary education	31	16.1
Bachelor and above	11	5.7
Fathers' education		
General literate	29	15.1
Primary education	15.1	15.1

Secondary level education	34.9	34.9
Higher secondary education	21.4	21.4
Bachelor and above	12.0	12.0
Monthly income		
5000-15000	11	5.7
15000-25000	68	35.4
25000-45000	69	35.9
More than 45000	44	29.9
Fathers' occupation		
Farming	20	10.4
Business	37	19.3
Labor	13	6.8
Abroad	48	25.0
Teacher	15	7.8
Other	59	30.7

35.9% (69) of the study participants family income was between 25000-45000 followed by 35.4% (68) family's income was 15000-25000, 29.9% (44) family income was more than 45000 and 5.7% (11) family income were between 5000-15000. In addition, 25.6% (48) fathers' job was abroad followed by 19.3% (37) fathers' job was business, 10.4% (20) Fathers job was farming, 7.8% (15) Fathers job was Teaching and 30.9% (59) Fathers job was other.

4.2. Knowledge level of the study population

99% (191) knew about junk food whereas 0.5% (1) did not knew about processed snack food. 99.5% (191) Agreed with standard definition of processed snack food compared to 0.5% (1) who did not agree on that. Students were asked to give examples of processed snack food and almost everyone gave correct examples of processed snack food. 44.3% (85) used to read nutritional labeling of processed snack food compared to 55.7% (107) who did not read. In addition, 88.5% (170) know about harmful effects of processed snack food whereas 11.5%

(22) did not know about it. In conclusion we can say that 41.7% had adequate knowledge regarding processed snack food consumption whereas 58.3% had Inadequate knowledge about processed snack food. The study findings correlate with the study conducted among university students of Delhi where it was found that 49.6% had inadequate knowledge whereas 50.4% had adequate knowledge about junk food (Tanveer, Tuba et al., 2020). The Knowledge level of the respondent is shown below in Table 4.5.

Table 4.5: Knowledge level of the population

Variables	Frequency	Percentage
Know about Processed snacks.		
Yes	191	99.5
No	1	0.5
Meaning of Processed snacks		
Yes	191	99.5
No	1	0.5
Examples of Processed snacks		
Correct answer	192	100%
Incorrect answer	0	0%
Harmful effect of processed snack food		
Yes	169	88.0
No	23	12.0
Read Nutrition labeling.		
Yes	84	43.8
No	108	56.3

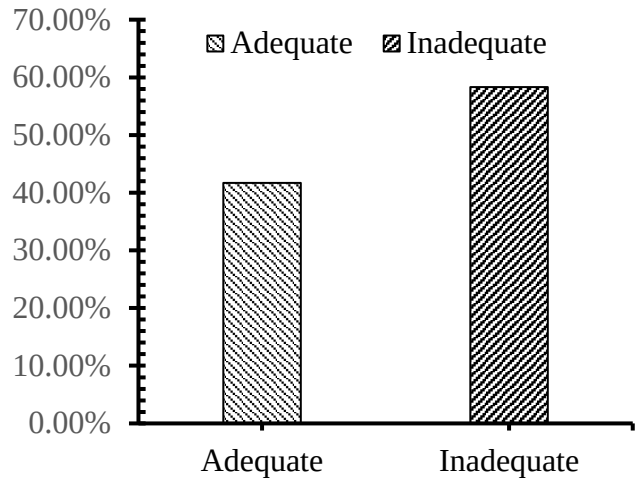


Figure 4.1: Bar graph representing knowledge level.

4.3. Attitude regarding Processed snack Food

47.9% had positive attitude towards junk food consumption and 52.15% had negative attitude towards junk food consumption. The study findings somewhat correlate with the study conducted among university students in Delhi where 52.3% had poor attitude and 47.4% had good attitude regarding junk food consumption (Tanveer, Tuba et al., 2020).

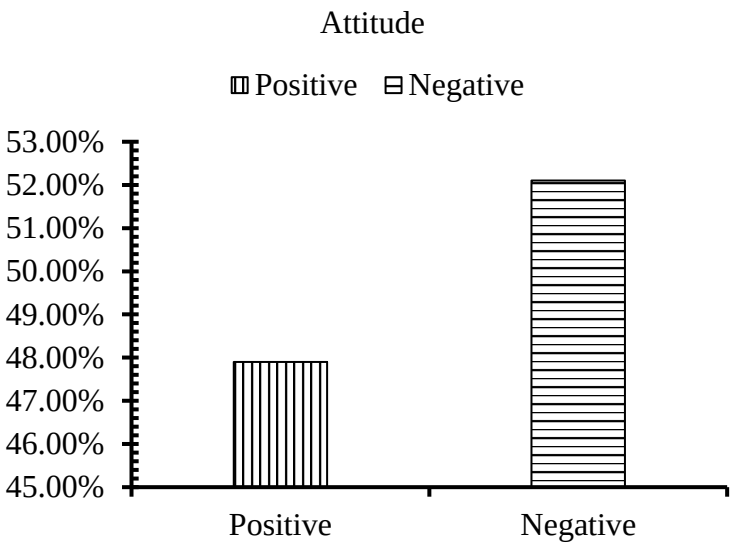


Figure 4.2: Bar graph representing attitude level

4.3.1. Agreement on obesity regarding Processed snack food Consumption

30.7% (59) stated they had no idea regarding obesity related to processed snack food consumption followed by 29.2% (56) Who completely agree that they become obese if they eat processed snack food, 27.1% (52) Agree, 8.3% (160) disagree, and 4.7% (9) completely disagree. The agreement on obesity regarding processed snack food consumption in given below in Table 4.6.

Table 4.6: Agreement on obesity regarding processed food consumption

Variables	Frequency	Percentage
Completely Disagree	9	4.7
Disagree	16	8.3
No idea	59	30.7
Agree	52	27.1
Completely Agree	56	29.2

4.3.2. Agreement on processed snack food gives you pleasure

37.0% (71) stated they had no idea regarding consumption of processed snack food giving pleasure to them, followed by 33.3% who agreed processed snack food consumption give them pleasure, 19.8% (38) who completely agree, 7.3% (14) Who did not agree and 2.6% (5) who did not completely disagree. The agreement on processed snack foods giving pleasure is given in Table 4.7.

Table 4.7: Agreement on processed snack food giving the pleasure.

Variables	Frequency	Percentage
Completely Disagree	5	2.6
Disagree	14	7.3
No idea	71	37.0
Agree	64	33.3
Completely Agree	38	19.8

4.3.3. Agreement on processed snack food tastes very good

46.4% (89) stated they agree processed snack food tastes very good, followed by 44.8% (86) who completely agree, 5.2% (10) who had no idea, 2.1% (4) who disagree, 1.6% (3) who completely disagree. The agreement on processed snack food tastes very good is given below in Table 4.8.

Table 4.8: Agreement on processed snack food tasting very good.

Variables	Frequency	Percentage
Completely Disagree	3	1.6
Disagree	4	2.1
No idea	10	5.2
Agree	89	46.4
Completely Agree	86	44.8

4.3.3. Agreement on processed snack food saves your time

45.3% (8) agreed junk food saves time followed by 22.9% (44) who had no idea, 16.1% (31) completely agree, 10.4% (20) disagree, 5.2% who completely disagree. The agreement on processed snack food saves your time is given below in Table.

Table 4.9: Agreement on processed snack food saving time.

Variables	Frequency	Percentage
Completely Disagree	10	5.2
Disagree	20	10.4
No idea	44	22.9
Agree	87	45.3
Completely Agree	31	16.1

4.3.4. Agreement on processed snack foods is very cheap and easy to consume

43.8% (84) agree followed by 25.0% (48) who have no idea, 16.7% (32) who disagree, 13.5% (26) completely agree and 1.0% (2) completely disagree. The agreement on processed snack food is cheap and easy to consume is given below in Table 4.10.

Table 4.10: Agreement on processed snack food are very cheap and easy to consume

Variables	Frequency	Percentage
Completely Disagree	2	1.0
Disagree	32	16.7
No idea	48	25.0
Agree	84	43.8
Completely Agree	26	13.5

4.3.5. Agreement on processed snack foods is good for health

45.3% (87) agree processed snack foods are good for health followed by 31.3% (60) who completely agree, 14.1% (27) said they had no idea, 5.2% (10) completely disagree, 4.2% (8) who completely disagree. The agreement on processed snack foods is good for health is given in Table below 4.11.

Table 4.11: Agreement on processed snack foods are good for health

Variables	Frequency	Percentage
Completely agree	60	31.3
Agree	87	45.3
No idea	27	14.1
Disagree	8	4.2
Completely disagree	10	5.2

4.3.6. Agreement on Taking processed snack food depends on emotion

35.9% (69) agree taking processed food depends on the emotion followed by 32.8% (63) who had no idea, 16.7% (32) disagree, 12.0% (23) completely agree and 2.6% (5) completely disagree. The agreement on taking processed snack food depends on emotion is given below in Table 4.12.

Table 4.12: Agreement on taking processed snack food depends on emotion.

Variables	Frequency	Percentage
Completely Disagree	5	2.6
Disagree	32	16.7
No idea	63	32.8
Agree	69	35.9
Completely Agree	23	12.0

4.3.7. Agreement on processed snack food causes harmful effects on health

40.6% (78) completely agree processed snack food causes harmful effects on health followed by 37% (71) who agree processed snack food causes harmful health effects, 9.9% (19) had no idea, 6.3% (12) disagree and 6.25% (12) completely disagree. The agreement on processed snack food causes harmful effects on health is given below in Table 4.13.

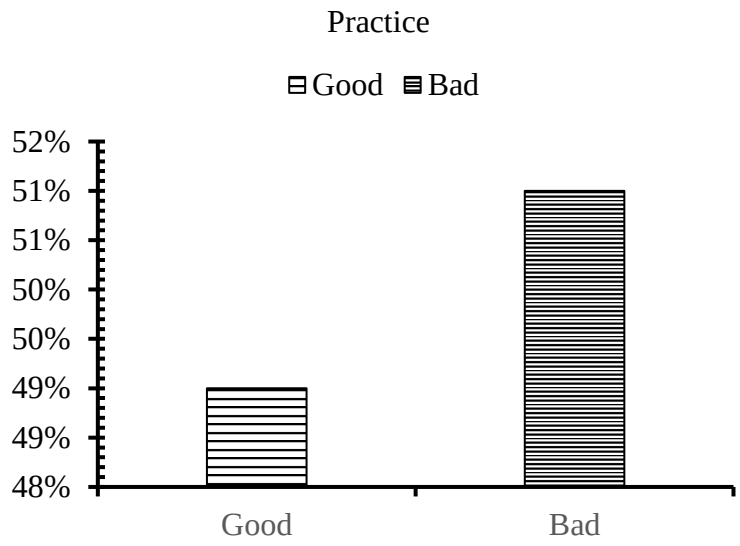
Table 4.13: Agreement on processed snack food causes harmful effects on health

Variables	Frequency	Percentage
Completely agree	12	6.25
Disagree	12	6.3
No idea	19	9.9
Agree	71	37.0
Completely agree	78	40.6

4.4. Practice on processed food

All students practiced processed food consumption. 49% had good practice about processed food consumption whereas 51% had bad practice about processed food consumption. In the study conducted by Subedi et al., (2021) it was found that every student practiced junk food consumption.

Fig 4.3: Shows practice level of study population



4.5.1. Family member consumes processed snack food

83.3% (160) family members consume processed snack food occasionally, 10.4% (20) family members consume processed snack food on regular basis, 6.3% (12) family member do not consume processed snack food. The table 4.14 given below shows processed food consumption pattern of family members.

Table 4.14: Processed snack food consumption pattern of family members

Variables	Frequency	Percentage
Regular	20	10.4
Never	12	6.3
Occasional	160	83.3

4.5.2. Processed snack food as snack on school

56.3% (103) students consume processed snack food as snack on school on regular basis followed by 40.6% (78) consume occasionally and 5.7% (11) do not consume processed snack food. The table 4.15 given below shows consumption of processed snack food as snack on school.

Table 4.15: Consumption of processed snack food as snack on school by study participants

Variables	Frequency	Percentage
Regular	103	53.6
Never	11	5.7
Occasional	78	40.6

4.5.3. Go outside home for dinner

68.2% (131) used to go outside home for dinner occasionally followed by 26.6% (51) who did not go and 5.2% (10) used to go outside home for dinner. The table 4.16 given below shows pattern of students going outside home for dinner.

Table no 4.16: Pattern of going outside home for dinner by study participants

Variables	Frequency	Percentage
Regular	10	5.2
Never	51	26.6
Occasional	131	68.2

4.5.4. Nutritional information influence decision to buy processed snack food

56.3% (108) reported that nutritional information did not influence them to buy processed snack food followed by 23.4% (45) who were influenced occasionally by nutritional

information to buy processed snack food and 20.3% (39) were influenced by nutrition information to buy processed snack food. Table 4.17 given below shows influence of nutrition information on decision to buy processed snack food.

Table 4.17: Nutrition information on decision to buy processed snack food

Variables	Frequency	Percentage
Regular	39	20.3
Never	108	56.3
Occasional	45	23.4

4.5.5. Checking expiry date while buying processed snack food

57.3% (110) used to check expiry date while buying processed snack food regularly followed by 23.4% (45) who used to check expiry date occasionally and 19.3%
(37) did not used to check expiry date while buying junk food. The table 4.18 given below shows study participants habit of checking expiry date while buying processed snack food.

Table 4.18: Habit of checking expiry date while buying processed food.

Variables	Frequency	Percentage
Regular	110	57.3
Never	37	19.3%
Occasional	45	23.4

4.5.6. Advertisements influence to buy processed snack food

36.5% (70) reported advertisements influenced them to buy processed snack food occasionally followed by 35.4% (68) who bought processed snack food due to advertisements and 28.1%

(54) did not buy junk food on influence of advertisement. The Table 4.19 given below shows advertisements influence on study participants to buy processed snack food.

Table 4.19: Advertisements influence on study participants to buy processed snack food

Variables	Frequency	Percentage
Regular	68	35.4
Never	54	28.1
Occasional	70	36.5

4.5.7. Frequency of processed food consumption

47.9% (92) used to consume processed snack food everyday followed by 24% (46) consume processed snack food 3 times a week, 19.3% (37) consume processed snack food 5 times a week and 8.9% consume processed food once a week. The Table 4.20 given below shows frequency of processed food consumption by study participants.

Table 4.20: Frequency of processed food consumption by study participants

Variables	Frequency	Percentage
Everyday	92	47.9
Once a week	17	8.9
3 times a week	46	24.0
5 times a week	37	19.3

4.5.8. Processed snack food as alternative to breakfast

51% (92) used to consume processed snack food as alternative to breakfast occasionally followed by 35.4% (68) did not consume processed food as alternative to breakfast and 13.6%

(26) used to consume processed food as alternative to breakfast on regular basis. The Table 4.21 given below shows pattern of consuming processed food as snack in breakfast by study participants.

Table 4.21: Consuming processed snack food in breakfast by study participants.

Variables	Frequency	Percentage
Regular	26	13.6
Never	68	35.4
Occasional	98	51.0

4.5.9. Checking Nutrient levels on processed snack food

40.6% (78) never checked nutrient levels on processed snack food followed by 39.1% (75) who used to check nutrient level occasionally and 20.3% (39) who checked nutrient level on processed snack food on regular basis. Table 4.22 given below shows habits of checking nutrient level on processed snack food.

Table 4.22: Habits of checking nutrient levels on processed snack food by study participants.

Variables	Frequency	Percentage
Regular	39	20.3%
Never	78	40.6%
Occasional	75	39.1%

4.6. Factors influencing processed food consumption

4.6.1. Reason behind preferring processed snack food

89.6% (172) preferred processed snack food because it was tasty, 5.7% (11) preferred processed food because it offered variety, 3.1% (6) preferred processed snack food because it saved their time and 1.6% (3) preferred processed snack food because it is expensive. Similarly in study conducted by (Sapkota & Neupane, 2018), it was found that taste was the main driving factor for junk food consumption among secondary level students. The Table 4.23 given below shows reasons behind preferring processed snack food.

Table 4.23: Reasons for preferring processed snack food.

Variables	Frequency	Percentage
It is tasty	172	89.6
It is inexpensive	3	1.6
It offers variety	11	5.7
It saves time	6	3.1

4.6.2. Consideration on buying processed snack food

63.0% (121) consider taste before buying processed snack food followed by 16.7% (32) who consider price before buying processed snack food, 14.6% (28) consider manufactured date before buying processed snack food, 2.6% (5) consider quantity before buying processed snack food, 2.1% (4) consider satiety before buying processed snack food and 1.0% (2) consider nutrition value before buying processed snack food. The Table 4.24 given below shows consideration on buying processed snack food.

Table 4.24: Consideration on buying processed snack food.

Variables	Frequency	Percentage
Price	32	16.7
Taste	121	63.0
Satiety	4	2.1
Quantity	5	2.6
Nutrition value	2	1.0
Manufactured date	28	14.6

4.7. Most preferred processed snack food

The most preferred snack food was noodles followed by cold drinks and chips and rest of all. Similarly in the study conducted among secondary level students in the Chitwan noodles was the most preferred snack food (Sapkota & Neupane, 2018). The Table 4.25 given below shows the most preferred processed snack food by study participants.

Table 4.25: Most preferred processed snack food by study participants

Variables	Frequency	Percentage
Noodles	55	28.6
Chips	40	20.8
Donuts	3	1.6
Pastries	29	15.10
Biscuit	20	10.4
Coldrinks	45	23.5

4.8. Correlation between knowledge and practice

There is no significant association between knowledge score and practice score. There is weak association between knowledge score and practice score. Despite adequate knowledge adolescents had bad practice of processed food consumption due to its taste and fancy advertisements. The correlation between knowledge and practice is given below in Table 4.26.

Table 4.26: Correlation between knowledge and practice

Knowledge	**Practice**		**X^2**	**P-value**
	Bad	**Good**		
Inadequate	62(63.3%)	50(53.2%)	2.003[a]	0.157
Adequate	36(36.7%)	44(46.8%)		

4.9. Comparing knowledge and attitude

There is no significant association between knowledge score and attitude score. There is weak association between knowledge score and attitude score. Table 4.27 given below compares knowledge with attitude .

Table 4.27: Compares knowledge with attitude.

	Attitude		**X^2**	**P-value**
Knowledge	**Positive**	**Negative**		
Inadequate	64(64.0%)	48(52.2%)	2.757[a]	0.097
Adequate	36(36.0%)	44(47.8%)		

4.10. Association between BMI and Knowledge level

There is no significant association between BMI and Knowledge level as indicated in Table no.4.30. In contradiction there was significant association between BMI and knowledge level

about fast food among the teenagers on the study conducted in Bangladesh (Adhani *et al*., 2018).

4.30: Shows association between BMI and Knowledge level.

	Knowledge		X^2	P-value
BMI	**Adequate**	**Inadequate**		
Normal	7(6.3%)	6(7.5%)	2.757[a]	0.426
Thin	85(75.9%)	54(67.5%)		
Overweight	20(17.8%)	20(25.01%)		

4.11. Association between BMI and Attitude level

There is no significant association between BMI and Attitude level as shown in Table no. 4.31. In contradiction there was significant association between BMI and attitude level about fast food among the teenagers on the study conducted in Bangladesh (Adhani et al., 2018).

Table 4.31: Shows association between BMI and attitude level.

BMI	Attitude		X^2	P-value
	Negative attitude	**Positive attitude**		
Normal	31(31.01%)	24(26.1%)	0.625[a]	0.732
Thin	49(49.0%)	47(51.1%)		
Overweight	20(20.0%)	21(22.8%)		

4.12. Association between BMI and Practice Level

There is no significant association between BMI and Practice level as shown in Table no. 4.42. In contradiction there was significant positive correlation between junk food consumption practice and BMI in the study conducted in India among adolescents (Kaur & Sharma, 2016).

Table 4.32: Shows association between BMI and practice level.

BMI	Practice		X^2	P-value
	Good	Bad		
Normal	37(37.8%)	18(19.1%)	0.625[a]	0.732
Thin	44(44.9%)	52(55.3%)		
Overweight	17(17.3%)	24(25.5%)		

PART V

Conclusions and Recommendations

5.1. Conclusion

The study aimed to assess the level of knowledge, attitude and practice about processed snack food among adolescents of Dharan, Nepal as a specific objective.

Following conclusions can be drawn from the study.

a) The study revealed that 41.7% had adequate knowledge whereas 58.3% had inadequate knowledge, 47.9% had positive attitude whereas 52.1% had negative, 49.99% had good practice whereas 51% had bad practice regarding processed snack food consumption.

b) The factor that was mainly responsible for the processed food consumption was taste. Most processed snack food contains abundance amount of sugar, fat and sodium. Sugar, fat and sodium significantly impact the taste profile of food.

c) Almost 100% of the participants practiced processed food consumption despite of positive knowledge and positive attitude.

d) There is no association between BMI and level of Knowledge, attitude and practice.

e) There is no significant association between practice score and knowledge score.

f) There is no significant association between practice score and attitude score.

5.2. Recommendation

Based on the study results, the following recommendation can be made:

a) The research based on knowledge, attitude, and practice about processed snack foods in Nepal is very minimal. Thus, similar research including changes in knowledge, attitude and practice after post intervention should be done.

b) High prevalence of processed food consumption and almost half of the participants had inadequate knowledge, negative attitude and bad practice which highlights the need for community based awareness programs about processed snack food.

PART VI

Summary

Processed food consumption is practiced by every adolescent. Globally processed foods are popular food stuffs and its consumption is increasing constantly. Traditional foods have been replaced by food items that are ready to eat and in canned form and preserved for a long item. Adolescence is the only time following infancy when the rate of physical growth actually increases. There is greater demand for calories and nutrients during this period. Poor Nutrition during this period can have lasting consequence on adolescent's cognitive development resulting in increased learning ability, poor concentration and impaired school performance as well as pre deposit adolescence to risk of various lifestyle related diseases. So, the purpose of the study was to access the level of knowledge, attitude, and practice about processed snack food among adolescents of Dharan, Nepal. The cross-sectional study was conducted among adolescents of Dharan, Nepal. Microsoft excel 2019 and SPSS version 26 and 29 was used to enter data and analyze it.

The main contributing factor of processed food consumption was its taste and fancy advertisements according to study participants. The most consumed processed food was noodles and cold drinks. There was no association between knowledge score and practice score. Out of 192 participants 41.7% had adequate knowledge whereas 58.3% had inadequate knowledge, 47.9% had positive attitude whereas 52.1% had negative, 49.99% had good practice whereas 51% had bad practice regarding processed food consumption. There is no significant association between BMI and level of knowledge, attitude and practice.

The study's findings demonstrated a considerable prevalence of processed food consumption. Thus, to combat the situation, programs should be implemented to raise awareness of harmful effects of processed snack foods by government in collaboration with schools and students.

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Appendices

Appendix A INFORMED CONSENT LETTER

My name is Nomita Bhattarai, a student of Nutrition and Dietetics at Central Campus of Technology, Dharan is going to conduct dissertation work in for the award of bachelor's degree in Nutrition and Dietetics. I am going to give you information about this research and invite you to participate in this research.

The topic for the study is "Assessment of knowledge, attitude and practice about processed snack fooods among adolescent of Dharan, Nepal..Under this study, knowledge, attitude and practice about junk food among adolescent will be assessed. The study will provide information about knowledge, attitude and practice about junk food among adolescent. During the study height and weight of the participants will be measured. Knowledge, attitude and practice about junk food will be assessed using questionnaire. The information obtained from the participants will be kept confidential. This study will make you known about your nutritional status. Some questions may be personal, all information you provide will be important and the privacy of information will be maintained and they will not be misused. Your participation in this study will be voluntary. You may not answer some or all questions if you feel them personal or sensitive. Please sign below if you want to participate in the study.

Name of participant: ……

Signature of participant: ……

Name of school: ……..

Date of survey: ……

Appendix B

A. Socio-demographic variables

1)What is your religion?

a)Hindu b) Buddhist c) Muslim d) Christian e) other

2) What is your caste?

a) Brahmin b) Janajati c) Chhetri d) Dalit

3) What is your parent's educational status?

a) Illiterate b) literate

If literate, what is the educational level completed by your mother?

a) General literate b) Primary education c) Secondary level education d) Higher secondary education e) Bachelor and above

What is the educational level completed by your father?

a) General literate b) Primary education c) Secondary level education d) Higher secondary education e) Bachelor and above

4) What does your father do?

a) Farming b) Business c) labor d) Abroad e) Teacher e) Other

5) What is your income of family?

a) 5000-15000 b) 15000-25000 c) 25000-45000 d) More than 45000

B. Questions related to knowledge

1) Do you know about processed snack food?

a) Yes b) No

2) What is the meaning of processed snack food?

Processed snack food may be defined as prepackaged snack high in calorie but low in nutritional value. a) Yes b) No

3) Examples of processed snack food?

7) Do you read Nutrition labeling on processed snack food?

a) Yes b) No

8) Do you know about harmful effects of processed snack food? a) Yes b) No

C. Questions related to Attitude

1) Do you agree you become obese if you eat processed snack food?

a) Completely agree b) Agree c) No idea d) Disagree e) Completely disagree

2) Do you agree processed snack food tastes very good ?

a) Completely agree b) Agree c) No idea d) Disagree e) Completely disagree 3) Do you agree processed snack food gives you pleasure?

a) Completely agree b) Agree c) No idea d) Disagree e) Completely disagree

4) Do you agree consuming processed snack food saves your time for doing other work compared to homemade food?

a) Completely agree b) Agree c) No idea d) Disagree e) Completely disagree 5) Do you agree processed snack food are cheap and very easy to consume?

a) Completely agree b) Agree c) No idea d) Disagree e) Completely disagree 6) Do you agree processed snack foods are good for health?

a) Completely agree b) Agree c) No idea d) Disagree e) Completely disagree

7) Taking processed snack food depends on the emotion. Emotion factors such as happy, sad, angry and stress.

a) Completely agree b) Agree c) No idea d) Disagree e) Completely disagree 8) Do you agree processed food causes harmful effects on health?

a) Completely agree b) Agree c) No idea d) Disagree e) Completely disagree

D. Questions related to practice

1) Do your family member consume processed snack food?

a) Yes b) No c) Sometimes

2) Do you consume processed snack food as an alternative to breakfast?

a) Yes b) No c) Sometimes

3) Do you consume processed food as snack on school?

a) Yes b) No c) Sometimes if yes than what do you consume mostly?

4) Do you go outside home for dinner?

a) Yes b) No c) Sometimes

5) Do advertisements influence you to buy processed snack food?

a) Yes b) No c) Sometimes

6) Do Nutritional information influence your decision to buy processed snack food? a) Yes b) No c) Sometimes

7) Do you check expiry date while purchasing processed snack food?

a) Yes b) No c) Sometimes

8) Do you check Nutrient levels on food?

a) Yes b) No c) Sometimes

9) How often do you consume processed snack food?

a) Every day b) Once a week c) 3 times a week d) 5 times a week

D. Factors related to processed snack food consumption

1) Which is your most preferred processed snack food?

a) Noodles b) chips c) Donuts d) Pastries e) Cold drinks

2) Why do you prefer processed snack food?

a) It is tasty.

b) It saves time

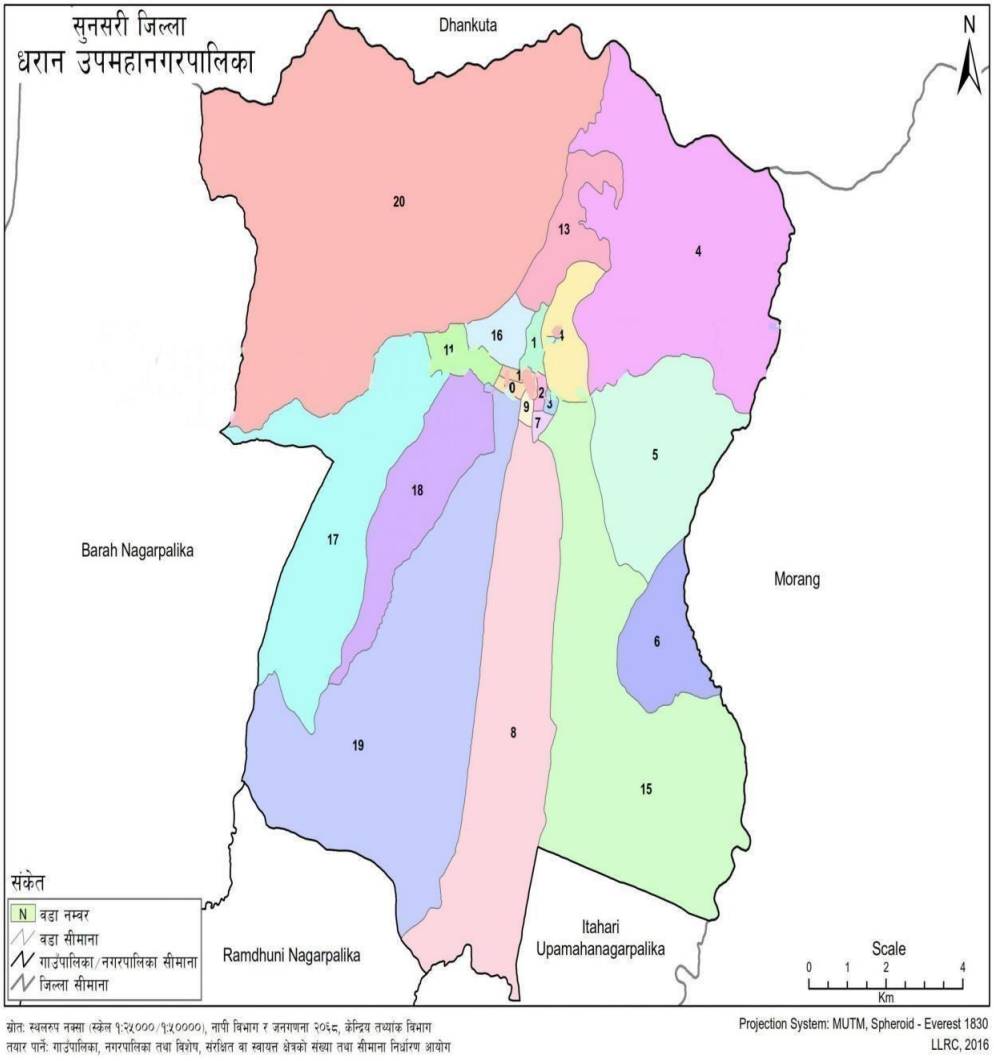
c) It offers variety

d) It is inexpensive

3) What do you consider while buying processed snack food?

a) Price b) Taste c) Satiety d) Quantity e) Nutrition value f) Manufactured date **Appendix C**

Study Site

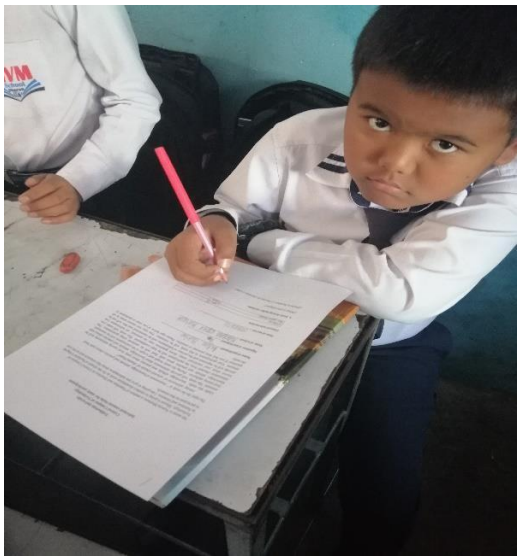


स्रोत: स्थलरुप नक्सा (स्केल १:२५०००/१:५००००), नापी विभाग र जनगणना २०६८, केन्द्रिय तथ्यांक विभाग
तयार पार्ने: गाउँपालिका, नगरपालिका तथा विशेष, संरक्षित वा स्वायत्त क्षेत्रको संख्या तथा सीमाना निर्धारण आयोग

Projection System: MUTM, Spheroid - Everest 1830
LLRC, 2016

Appendix D Photo Gallery

a) Measuring Weight



b) Students Filling Questionnaire

b) Explaining Questionnaire

d) Measuring Height