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## Factors affecting snack consumption across various stages of lifecycle

Radhika Sharma and Yamee Shah

### Abstract

Snacking, or eating between the three main meals, is a routine trend among people of all ages. The type and frequency of snacking affects health over the course of a person's life. The main objective of this study article would have been evaluated the dietary patterns and health effects of eating among various age groups. Unhealthy snacks that are low in nutrition, heavy in energy, sugar, and salt had been shown to have an adverse effect on people's health, including including heart rate, overweight, insulin and tooth loss. Important factors like study stress, lack of time, employment status, skipping regular meals etc. affected snacking quality among various age groups. Consumption of food that are high in calories with poor low nutritive value was seen among children and adolescents. Consumption of food from restaurants is one. Nutritional component that has grown in popularity during the past few decades. Young adults (20–39) report consuming snacks on a daily basis at a rate of 45% in the United States, which is the highest of any age group. it could be challenging to buy food, carry heavy goods, make a variety of food choices, and prepare meals. For many old age, getting to the shop may be challenging now that the neighbourhood food store is vanished. As a result, many older people find it useful to keep a backup supply of nutrition on hand for ill days or adverse weather.

**Keywords:** Snack, food pattern, consumption, unhealthy snacks, healthy snacks, nutrition guidelines

### Introduction

Dietary habits and eating patterns have undergone major global change in recent decades [1]. The body needs a healthy diet to establish a strong immune system and defend against viruses and other disorders [2]. Food preferences may be influenced by socioeconomic position, which is determined by individual earning and/or the education level of parents for all ages. People with lower socioeconomic level who live in fragile and unsafe neighborhood areas are likely to have access to harmful, nutrient-poor diets [3]. Snacking means eating outside the three main meals. Snacking and good eating practices have been linked to improved sugar level management in adults [4] and diabetics [5] as well as control of appetite and body weight, and hunger control. However, overeating of snacks occurs due to larger food portions, higher food palatability, increased energy density, various social and psychological reasons [6]. Given the conflicting findings of recent research on wellbeing implications of snacking, the question of whether eating and snacking more frequently is beneficial for health still persists in this context. Snacks have the potential to change the energy balance over time if consumed in addition to regular meals and without making up for the extra calories they contain. Therefore, more information about elements like food selection and exercise can help us educate us as to how snacking affects the obesity problem [6]. One health consequence that appears to be related to snacking and eating frequently is co-relation with better cardiovascular health markers, such as total cholesterol and blood pressure [7-9]. The risk of heart disease (CVD) may be reduced and lipid profiles may be improved by frequent eating [10]. Around the world, different percentages of young adults prefer snacks to meals. Many toddlers, teenagers, and college students in developing nations are said to skip meals and increase their snacking habits [11, 12, 13]. Teenagers now consume more snacks than they did a decade ago. It has also been demonstrated that the main calorie sources in snacks foods, and beverages with added sugar [14]. The consumption of calorie-dense, less healthful snacks has increased while consumption of fruits and vegetables has dropped [15]. Snacking has been linked to the workplace [16], and these adults are more likely to be employed than younger or older persons. Students are particularly addicted to snacking. Adults enrolled at colleges find it difficult to maintain good eating habits due to a lack of time and the stress associated with being a student, so they instead eat unhealthy snacks, skip meals, buy fast food, and eat out [17].

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On college campuses, most snacks are sweet or salty and contain a lot of solid fats and added sugars <sup>[18]</sup>. The impact on consuming a balanced diet that comes with increased snacking is one of the problems. Unhealthy snacking has been identified as a prevalent cause of poor eating behaviors and weight increase in college students <sup>[19-20]</sup>. Other studies have revealed that students find it challenging to eat properly when living on campus because they lack the knowledge and abilities necessary to make healthy snack selections <sup>[21-22]</sup>. The research on the various patterns, consequences, and health outcomes of snacking behaviors among various demographic groups over the course of a person's lifetime, from young children to the elderly, is reviewed in this study.

### Snack foods and its benefits

According to Nuru and Mamang snack that is consumed any ingested food or drink. in between regular schedule main meals without replacing a meal and that provides high energy but poor nutrition in comparison to main meals <sup>[23]</sup>. Recent studies have looked into how frequently people eat and how snack can affect their diet's quality and wellbeing, but the results have been controversial <sup>[24]</sup>. Snacking's nutritional value determines whether it has a direct or indirect impact on health <sup>[25]</sup>. It has been demonstrated that eating wholesome snacks that include whole fruits and vegetables improves the quality of diet and has a good impact on body weight <sup>[26]</sup>. Several studies have shown that the main sources of energy consumed during snacking were desserts, candies, potato chips, fruit, bread, and milk. In a similar manner, children's primary sources of snack energy are energy-dense foods including cakes, buns, biscuits, and sugary drinks <sup>[27, 28, 29, 30]</sup>. Regularly foods with high snacks enhances daily energy intake, which can result in a growth in body weight and nutritional deficiencies <sup>[31, 32, 33]</sup>. The health would benefit from more frequent eating, according to a study by Hunter and Mattes. Possibly the most researched outcome is blood sugar <sup>[34]</sup>. According to Arnold *et al.*'s findings <sup>[35]</sup>, healthy subjects who ate nine meals per day with the same calorie intake as three meals had lower fasting plasma total cholesterol, reduced lipoprotein (LDL), and high-density lipoprotein levels. In the NHANES data, higher eating frequency was linked to lower cardiovascular mortality, even after accounting for the Healthy Eating Index score and caloric intake <sup>[36]</sup>. Evidence obtained from cross-sectional demand a relationship between higher eating frequency and lower total and LDL cholesterol levels. The relationship between eating habits and patient outcomes, however, has also been shown to be negative <sup>[37]</sup>. On the other hand, two studies found that snacking increases intake of micronutrients like antioxidant, vitamin C, dietary folate, soluble fiber, potassium, iron, sodium, and magnesium as well as foods like fruit and lipids <sup>[38, 39]</sup>. Various food habits among American adults, kids, and teenagers have been linked to overall diet adequacy. Eating a lot in between main meals might help the body get the necessary quantities of nutrients when growth or development is occurring quickly <sup>[40, 41]</sup>. Results from a European cohort showed that people who ate over than six meals per day had lower levels of total and LDL cholesterol than people who only ate either one or two meals in a day <sup>[42]</sup>. After controlling for confounding factors, it has also been demonstrated that eating numerous meals-between four to six per day-had a favorable effect on lowering the risk of obesity in comparison to eating fewer than three meals per day <sup>[43, 44]</sup>.

### Snack pattern in children's

According to a study done on kids between the ages of 2 to 5 years old, snacks contribute for 26% to 27% of their overall energy needs and the nutrients they supply are inadequate <sup>[45]</sup>. Children that consume too much energy develop too much weight and become obese <sup>[46]</sup>. Snacking could be connected to this <sup>[47]</sup>. Snack consumption has been linked to a rise in energy density and a decrease in micronutrients <sup>[41]</sup>, as well as the emergence of additional childhood adiposity problems <sup>[48]</sup>. Given their significant role in daily energy consumption, parents may feel that snacks contain the majority of nutrients important for growth and development <sup>[49]</sup>. Yet, it is unknown if snack is a "main" or "essential" part of children's nutrition <sup>[49]</sup>. It is crucial to research how parental supervision affects kids' eating habits and bodyweight, particularly when they snack <sup>[50-51]</sup>. Because of their low cost, affordability, and accessibility, parents do not place any restrictions on the quantity of daily snacks which is consumed by their kid's <sup>[52]</sup>. Considerable research investigated the relationship between viewing television and children's increased snacking and weight gain <sup>[53-54]</sup>. A higher BMI has been linked to reduced activity, watching cartoons for extended periods of time while consuming high-energy snacks, and seeing ways to promote for fast food and high-energy snacks <sup>[55]</sup>. Additionally, there is a connection between socioeconomic background and obesity rates, as rising family income was linked to a rise in obesity rates, whereas nutritional status and television viewing did not appear to be directly related to lower or higher socioeconomic status <sup>[56]</sup>. Furthermore, Martines *et al.* <sup>[57]</sup> demonstrated that children from the United States who watched television for long periods of time consumed more ultra-processed meals, reflecting a negative effect on the nutritional content of those items. Similarly, a study by Börnhorst *et al.* <sup>[58]</sup> suggest a potential link between excessive screen use and more frequent consumption of high-fat, high-sugar, or high-salt products.

### Effects- Tooth Decay

Multiple studies have shown that young children who consume diets high in sugar frequently suffer dental issues. Dental decay is also linked to parental inaction about children's use candy or chocolate. According to the long-term study, brushing did not prevent deterioration in children between the ages of 2 to 5 who consumed sweets and chocolate just occasionally. But, brushing could lower the damage in kids who consume sweets on a daily basis or more. According to one study, cleaning teeth can only partially offset the effects of snacking and sugar consumption on the development of dental problems in youngsters. To prevent tooth disease in youngsters, limited diets—and in particular, reduced sugar snacking—must continue to be advocated <sup>[59]</sup>.

### Snack Pattern in adolescents

Processed food and takeaway consumption is rising in Western countries and adults and adolescents are the groups with the highest rates of consumption. In developing nations, this harmful habit is likewise growing in acceptance. Teenagers take more responsibility for their lifestyle when they enter university, especially if they are live far away from home. This helps to control their eating habits and lifestyle choices. A major worry is the ways in which adolescents consume food and the corresponding nutritional concerns. Young people's preference for unhealthy food is a result of

lifestyle changes and the end of the family custom of sharing meals. Together with a sedentary life, they switch from wholesome, home-cooked food to more practical, long-lasting snacks has led to global obesity and its associated health problems. Due to its high caloric density, high quantities of carbs and calories, and relatively low levels of fiber and protein, unhealthy food consumption on a regular basis can raise the risk of excess fat and obesity. Overweight is thought to be highly affected by dietary choices and way of life. The new generation is troublingly choosing harmful snacks over nutritious ones, which has a long-term adverse effect on their health and puts additional financial strain on parents because these items are expensive. Despite the fact that youngest people eat snacks as part of social events, they are developing cravings since the food's preparation contains appealing ingredients. The majority of the time, students like these packaged foods in order to save money and time due to its easy accessibility and availability. A number of locations in India and across the world have reported food-borne illness linked to the eating coming from external foods. Salmonella type is a current pathogen that is a significant food-contaminating bacterium that is responsible for a significant portion of human infections around the world. Many raw veggies from different nations have been found to contain Salmonella, and epidemics of the disease in the United States have been linked to these items (Toormina, 1997). Therefore, it is essential that a research be done to determine how often people eat from the cafeteria and what issues they experience. A nutritious diet can help prevent non-communicable diseases such as diabetes, heart problems, dementia, and tumor as well as undernutrition and disorders linked to diet. Adolescents should adopt healthy eating habits, such as balancing caloric

intake and activity, eat healthy fat like converting from saturated to unsaturated fats, limiting intake of sugar and sodium, and avoiding commercially generated trans fats [60]

**Guidelines for maintaining healthy diet in children’s and Adolescents**

Another food area of concern is the selling of non-standardized or customized foods including "dosa, pakora, bread pakora, tikki, jalebee, etc. These should only be prepared in schools once a month, after making them more nutrient-dense and properly advertising their nutritional content. The school authorities must ensure supervision of these foods through appropriate cafeteria norms that support wholesome, nutritious, and healthy diets. School canteen should offer a variety of options for wholesome, nourishing foods and drinks in schools. Increase student intake of a balanced, nutrient-rich diet. School children should be encouraged to eat foods like low-fat milkshakes, fruit smoothies, tofu, vegetable cutlets, upma, idli, and utthapam along with vegetable sandwich. Children should avoid eating anything from the school cafeteria that contains added salt, artificial sweeteners, or unhealthy fats. There should be limitation on foods high in saturated fat, including fatty foods, potato chips, packaged burgers, pastry, desserts, and other salty snacks. Avoid using table salt, encourage students to prevent from consuming added sugar-containing unhealthy foods and beverages, such as candy, sweetener soft drinks and syrups, Fruit beverages, and energy and sports beverages, and limit their sale at schools. For the canteens, foods can be divided into groups based on the color-coded concept and according to their nutritional content.

**Table 1:** Color-coded concept for non-standardized foods [61]

Color coded	Attribute	Sources
Green color – Always on Menu Promote and advertise these foods and drinks.	These items should be provided daily and should be the main selections on the canteen menu as they contain a large variety of nutrients and are typically cholesterol - free, sugar, and/or sodium. These meals and beverages are the best options for a healthy school cafeteria (salt).	Lean protein, poultry, fisheries, fruits, vegetables, lentils, and grains (cereals)—mostly whole grains and/or nutrient dense. Plain and flavored low- or reduced-fat milk and soy drinks. Water: Pure and unsalted.
Yellow color-choose carefully Keep portion sizes moderate and stop allowing these foods and drinks take over the menu.	If consumed in substantial quantities, these foods and drinks have considerable levels of sodium (salt), sugar, and/or unhealthy fats. They also have some essential vitamins. If ingested in significant amounts, it might result in an increase in energy (kilojoules).	The best strategy is to go green, eat less frequently, and limit portion size. baked vegetable-based snacks, dairy pastries, ice cream, and milk-based ices, and some others. full-fat dairy Juice that is at least 99 percent fruit or vegetable juice and has no added sugar (200 mL)
Orange Color Not a meal On the menu of the canteen, not advised.	These meals and drinks may have excessive energy content (kilojoules), unhealthy fats, sodium, sweets, and/or low nutritional value.	Energy drinks, fizzy soft beverages, and processed foods that are deep-fried or rich in high fat, salty, and sugar, such as brownies, potato cubes, etc. Orange is the broad classification for all sweets.

Source: Ministry of Woman and Child Development Government of India 2015

**Snack pattern in Adults**

The stage of life where the occurrence of overweight and obesity rises the fastest is early adulthood (ages 18 to 30) [62]. This rise is probably caused due to unhealthy food that is typically consumed at this age. Early-life habits, such as those related to obesity, such as nutritional intake, eating patterns, and physical activity patterns, may last into late life [63], affecting the likelihood of developing non-communicable diseases later in life [64]. Initial adults have been noted as a crucial period for health behavior changes, which may be more effective at a time when habits are being uprooted by lifestyle changes [65-66]. To guide the creation and targeting of

diet treatments, it is important to have a better knowledge of the factors influencing dietary changes during young adulthood and how this leads to the formation of long-term dietary behaviors [67]. Consumption of food from restaurants is one unfavorable nutritional component of people's diets that has grown in past few decades (20–39) report consuming snacks on a daily basis at a rate of 45% in the United States, which is the highest of any age group [68]. Young adults (16 to 24 years old) in the UK were also the age category reporting the most food intake, with 54% reporting doing so within the previous month [69]. Regular intake of snacks is associated with a lower quality diet overall, and long-term studies have



indicated that eating snacks more frequently increases risk of gaining weight and developing insulin sensitivity over the next 15 years in individuals <sup>[70]</sup>.

#### **Guidelines for maintaining healthy diet in Adults.**

Every day, consume a variety of fresh vegetables, fruits, legumes (such as legumes and peas), nuts, and whole grains (such as unprocessed maize, millet, oats, wheat, and brown rice). Adults should have 180 g of grains, 2.5 cups of vegetables (5 servings), 2 cups of fruit (4 servings), and 160 g of meat and legumes per day. Chicken and red meat can both be consumed two to three times each week. Eat a minimum of 5 servings (400 g) of vegetables and fruits each day. Minimize daily free sugar intake to no more than 12 level teaspoons (50 g), or, for even better health, no more than 5% of overall calorie intake. Don't consume more than 30% of daily calories from fat. Saturated fats, such as those in fatty meat, butter, palm and coconut oil, cream, cheese, ghee, and pork, are to be avoided. Unsaturated fats, on the other hand, are found in foods like fish, bananas, nuts, sunflowers, canola, and cooking oil. A healthy diet should not include commercially generated trans fats, which can be found in processed foods, snacks, French fries, pizza, desserts, biscuits, animal fats, and sauces. Use iodized salt and keep your daily salt intake to around 5 g (about 1 teaspoon) <sup>[71]</sup>.

#### **Snack pattern in Elderly**

The majority of people can enjoy active, healthy lives well into their senior years. Maintaining an active and healthy lifestyle can be achieved with a balanced diet and enough exercise. The normal physical changes that occur with ageing, however, can have an impact on nutritional intake. Variations in physical changes take place from individual to person. While some physiological processes may not alter much with age, others may. The majority of people maintain good dietary habits long into old age, however occasionally, aging-related variables can impact food intake. The following aspects, most of which are minor, may have an impact on nutritional intake as one ages like smell and taste. In later years, the perceptions of taste and smell typically deteriorate. Foods might not taste the same as they did when they were younger. This is because a person's taste sensations are at their highest point during childhood, and they start to decline as they become older. Additionally, food may smell differ as one ages because sensory cells, the sensory unit involved in smell, become less with time. One's appetite for food may be significantly reduced by these changes in taste and smell, leading to an inadequate diet. Additionally, some drugs can alter how food tastes. Age often results in worsening eyesight. Purchasing, preparing, and eating could be more challenging as a result. Meal preparation may suffer from difficulties reading oven temperature or small print in recipes. With age, saliva production may decline. Food becomes more easily swallowed and moistened by saliva. Therefore, some people find that food is dry and harder to swallow as they become older. Flexibility and muscular strength with age, muscle coordination and tone frequently deteriorate. This may make swallowing challenging and inhibit the passage of food through the intestines. The majority of commercials for laxatives target older adults. Congestion is frequently treated with a well-balanced diet consisting of a variety of meals, enough fiber, drinks, and physical activity. Aging may cause the gastric liquid in the stomach to become less acidic.

Decreased digestion and dyspepsia are the results of this sodium bicarbonate can further reduce the amount of stomach acid in older persons, who may be tempted to take it. Avoid consuming baking soda and get the appropriate medical guidance from your doctor instead. Aging causes the number of gastrointestinal enzymes in many adults to decline. The ability to tolerate milk or foods high in fat may decline as the amount of digestive enzymes decrease. Endurance and vitality with advancing years, one's strength and stamina may decline. As a result, it could be challenging to buy food, carry heavy goods, make a variety of food choices, and prepare meals. For many old age, getting to the shop may be challenging now that the neighborhood food store is vanished. As a result, many older people find it useful to keep a backup supply of nutrition on hand for ill days or adverse weather <sup>[72]</sup>.

#### **Guidelines for maintaining healthy diet in Elderly**

Some foods to have on hand include the following: Foods high in protein include lentil soup, split pea and sausage soup, mackerel in water, uncooked foods, canned beans, and peanut butter. Fruits, including canned and dried fruits veggies—frozen and canned vegetables. Dairy includes cheese and fat free dried milk. Grains include wafers, hot cereals, fully prepared cereals, rice, and pasta. Packaged foods include jelly, limited canned soups, dessert, dry soup mixes, and pasta and cheese. Nutritional Impacts of Behavioral and Social Disorders with aging for many senior citizens, boredom is a serious issue, particularly for those who consume food alone. When a person is alone, there isn't much motivation to cook and enjoy a satisfying meal. Isolation can make people less hungry, which can result in boring meals, frequent snacks, and easy-to-prepare, inexpensive, and soft high-carbohydrate foods like breads, biscuits, sandwiches, and bland cereals. Such eating routines have the potential to develop into habits and potentially lead in deficiency. More than just basic nutrients are obtained through food. Additionally, meals serve as a time for social interaction, family get-togethers, and information sharing. Food is related with social events like weddings, vacations. Routine regular meals may stop making sense when the social component is gone. Old age centers, church, and other service organizations offer community nutrition programmers that offer wholesome meals, companionship, and travel. Many people may lose their appetite as a consequence of the various physiological, mental, and social changes that occur with age. Although not all of these issues may be resolved, interest in eating a good, well-balanced diet must be kept up. Except for a reduction in the number of calories required, nutritional demands do not change as people age. The strongest line of defense for remaining healthy and avoiding disease may be a nutritious, well-balanced diet. For elderly people with a diminished appetite, the following advice may help stimulate their attention and enhance food consumption. Include vital foods first when addressing nutrition-related factors. Limit consumption of foods like pastries, cakes, and oils that are high in calories but low in nutrients. Instead dessert, choose fruit and veggies. Increase food intake by using snacks. Try peanut butter, cheese and crackers or fruit. In order to avoid thirst and diarrhea, drink plenty of fluids daily. Congestion can also be relieved with adequate fiber from whole grain products including fruits, salads, grains, and porridge eat mindfully and gently <sup>[73]</sup>.

#### **Conclusion**

The risk of non-communicable illnesses is decreased by

eating at least 400 g, or 5 servings, of vegetables and fruits per day (2). It also helps to ensure that one consumes enough dietary fiber food each day. One can boost vegetable and fruit intake by constantly including them in meals and by having fresh vegetable and fruits as snacks. Eat seasonal, fresh fruits and vegetables along with a variety of other fruits and vegetables. In order to prevent harmful weight gain, total fat intake should be reduced to less than 30% of total energy intake. Additionally, lowering total trans- fat consumption to less than 1% of total calorie intake and lowering saturated fat intake to less than 10% of total calories lowers the risk of having non-communicable illnesses. By declining the quantity of high-sugar foods and beverages (such as sweetener sodas, unhealthy treats, and confectionery), and substituting fresh fruit and raw vegetables instead of sugary snacks as snacks. Healthy snacking can be adopted by encourage cooking skills along with awareness regarding assures reliable, consistent, and relevant information on the nutrition found in food through nutrition labelling.

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