FACTORS RELATED TO JUNK FOOD CONSUMPTION BEHAVIOR AMONG STUDENTS IN JILIN PROVINCE, CHINA

WANG XINTONG

The Independents Submitted to Chiang Rai Rajabhat University

for the Degree of Master of Public Health (Public Health)

July 2025

摘要

标题:吉林省学生垃圾食品消费行为的相关因素

学生姓名:王鑫彤

学位:公共卫生学硕士

专业:公共卫生

学年: 2025

指导老师:

Assistant Professor.Dr. Pinatthinee Jitkham 首席顾问

Assistant Professor.Dr. Nattra Somkamlang 联合顾问

本研究旨在调查中国吉林省四平市第三中学学生的垃圾食品认知水平与消费行为，并探讨其相关影响因素。本研究采用横断面描述性研究，采用分层随机抽样方法，从 1560 名学生中抽取 350 名样本，使用发放问卷收集数据。并运用 SPSS 进行数据分析，采用频率分布、百分比、卡方检验方法进行数据处理。

研究结果显示，在学生对垃圾食品认知中，38.86%学生低水平，40.86%学生中等水平，20.28%学生高水平。在学生对垃圾食品消费行为中，15.71%学生低水平，40.86%学生处于中等水平，43.43%学生处于高水平。影响垃圾食品消费行为的显著因素包括年龄、月生活费用、身体质量指数（BMI），而性别、宗教信仰、基础疾病和知识水平与消费行为无显著关联。

结论方面，研究验证了所有两个假设：（1）学生对垃圾食品消费认知处于中等水平，学生对垃圾食品消费行为处于高等水平。（2）垃圾食品消费行为与个人因素有关，如年龄、每个生活费、BMI 显著相关。因此，未来需通过加强健康教育、改善家庭与社会环境来引导青少年形成健康饮食习惯。

关键词: 学生；垃圾食品；消费行为；认知；影响因素

ABSTRACT

Title: Factors Related to Junk Food Consumption Behavior Among Students in Jilin Province, China

Author: Miss Wang Xintong

Degree: Master of Public Health

Major Field: Public Health

Academic Year: 2025

Advisors:

Associate Professor Dr. Pinatthinee Jitkham **Major Advisor**

Assistant Professor Dr. Nattra Somkamlang **Co- Advisor**

This study aimed to investigate the level of awareness and junk food consumption behavior among students at Siping No. 3 High School in Jilin Province, China, and to explore associated influencing factors. The study employed an analytical cross-sectional approach, using stratified random sampling to select 350 samples from 1,560 students. Data collection was conducted through the distribution of questionnaires. Statistical analysis was performed using SPSS, with data processed using frequency, percentages, and Chi-square tests.

The research findings showed that among students 'perceptions of junk food, 38.86% had a low level, 40.86% had a moderate level, and 20.28% had a high level. In terms of students' junk food consumption behavior, 15.71% was at a low level, 40.86% was at a moderate level, and 43.43% was at a high level. Significant factors influencing

the junk food consumption behavior included age, monthly income, and BMI, while gender, religious beliefs, and congenital diseases showed no significant correlation with consumption behavior.

In conclusion, the study confirmed both hypotheses: (1) Students' knowledge of junk food consumption was at a moderate level, while the consumption behavior was at a high level. (2) Junk food consumption behavior was related to personal factors such as age, monthly income, and BMI. Therefore, in the future, providing health education and improving family and social environments to guide adolescents in forming healthy eating habits should be enhanced.

Keywords: students; junk food; consumption behavior; cognition; influencing factors

ACKNOWLEDGMENTS

The successful completion of this paper is inseparable from the selfless guidance and silent support of many good teachers and friends. Here, I am filled with gratitude to all the people who have given me care, help and support in my study and research.

Firstly, I would like to extend my heartfelt gratitude to my mentor, Professor. With your rigorous academic attitude, extensive knowledge base, and meticulous guidance, you have accompanied me through all the difficulties and challenges encountered during the research process.

I would like to thank all the teachers of college and public health major for broadening my academic vision and laying a solid foundation for my research. At the same time, I would like to thank the university for providing a good scientific research platform and resource support, which enabled this project to be carried out smoothly.

I would like to thank the school leaders and teachers of Si Ping the third middle school in Jilin Province, especially the 350 students who participated in this survey. It is because of your active cooperation and true answers that the data of this study is rich and solid, and the research can be carried out smoothly.

Finally, I would like to thank my classmates who have studied and discussed with me. When I encountered confusion and bottlenecks, your company and encouragement became an important driving force for me to move forward.

I would like to thank all the people who have given me care and support on my academic journey! Your help will be a precious treasure in my life.

Wang Xintong

July 2025

CONTENTS

PAGE

CONTENTS (Continued)

CONTENTS (Continued)

CHAPTER **PAGE**

CONTENTS (Continued)

CHAPTER **PAGE**

LIST OF TABLES

LIST OF TABLES (Continued)

CHAPTER I

INTRODUCTION

Background and rationale

In recent years, China has experienced a dramatic increase in the consumption of junk food, particularly among its younger population. This shift has significant implications for public health, as the consumption of junk food is closely associated with a range of chronic health conditions, including obesity, diabetes, and cardiovascular diseases. (Xiang et al,2022) The growing prevalence of these health issues in China can be partly attributed to changes in dietary habits, driven by urbanization, economic development, and the increasing availability of processed and fast foods. In the United States, 36% of children and adolescents eat fast food within a single day. In Saudi Arabia, a study conducted in 2020 showed that the consumption of fast food and junk food was high (87%).

Junk food typically includes foods that are high in fat, sugar and salt (Subedi et al,2021). These foods often lack essential nutrients like vitamins, minerals and dietary fiber (Kaur et al,2019). Mirhadyan(2019), Michael Jacobson, director of the Center for Science, coined the phrase “junk food” in 1972 to describe salty and sugary snacks, fried fast food, and sweet carbonated drinks. Cereal, candy, carbonated drinks, chocolate cake, ice cream, and fast food are considered junk food. Meanwhile, pizzas, burgers, and sandwiches fit under this category due to their ingredients and cooking techniques (Mirhadyan et al, 2019).

The rapid urbanization and economic development in China have led to lifestyle changes that favor the consumption of processed and fast foods. (Yang,et al,2024) This shift has been particularly pronounced in major cities, where fast-food chains and convenience

stores are widespread. The accessibility and affordability of junk food make it an easy option for many, particularly young people who may lack the knowledge or motivation to make healthier food choices.

A study by Shihan Zhen et al found that eating junk food in Chinese adolescents was associated with an increased risk of chronic disease later in life. The study noted that while the immediate effects of junk food consumption might include weight gain and poor nutrition, the long-term impacts are far more severe, including an elevated risk of type 2 diabetes, cardiovascular disease, and certain types of cancer (Zhen et al, 2018).

Furthermore, research has shown that the knowledge and attitudes of Chinese consumers towards junk food play a crucial role in their dietary behaviors. A survey conducted by the "China Health and Nutrition Survey" indicated that while there is some knowledge of the negative health effects of junk food, many consumers continue to prioritize taste and convenience over nutritional value (Jiang et al., 2024). This lack of knowledge or disregard for the health risks associated with junk food consumption underscores the need for comprehensive public health campaigns aimed at educating the population about the dangers of poor dietary choices.

Another factor contributing to the rise in junk food consumption is the aggressive marketing strategies employed by food companies. These strategies often target young consumers through advertisements that emphasize the convenience and appeal of junk food. (Coates et al, 2024) The proliferation of mobile technology and social media has further amplified these marketing efforts, making it more challenging for public health messages to reach and resonate with the intended audience.

The increase in junk food consumption has also been linked to the rise of non-communicable diseases (NCDs) in China. According to the "Global Burden of Disease

Study," NCDs are now the leading cause of death in China, accounting for over 80% of all deaths.(Minyan Wang,et al,2023)The study highlights that dietary risks, including the high intake of processed foods and sugary drinks, are among the top contributors to the burden of disease in the country.

Given the growing public health crisis, it is essential to address the knowledge gaps and behavioral factors that drive junk food consumption in China. Public health initiatives should focus on educating the population about the health risks associated with junk food and promoting healthier dietary choices. Additionally, policymakers should consider implementing regulations to limit the marketing of junk food, particularly to vulnerable populations such as children and adolescents (Li et al, 2024).

According to the data from the Global Burden of Disease Study 2021, obesity (high Body Mass Index, BMI) has become one of the leading risk factors for death globally. In 2021, approximately 3.7 million deaths worldwide were attributed to high BMI, a more than 2.5-fold increase from 1.46 million in 1990. (Sarah S Richardson ,2023)This trend is evident in both men and women, particularly in low-and middle-income countries (SDI), where age-standardized mortality rates and disability-adjusted life years (DALYs) show the highest annual growth rates.(Popkin ,2023)This represents a significant increase from previous decades and highlights the growing public health challenge posed by poor dietary habits. In Western countries, junk food consumption is strongly associated with the prevalence of obesity. Studies have shown that the number of eating junk food per increased meal significantly increases the risk of obesity. The World Health Organization (WHO) reports that in 1990, only 2% of children and adolescents aged 5 to 19 worldwide were obese; by 2022, this proportion had risen to 8%, or about 160 million people. The World Health Organization (WHO) also reports that between 1990 and 2019, the number of people with

hypertension (blood pressure at 140/90 mmHg or higher, or taking antihypertensive medication) doubled, from 650 million to 1.3 billion ("First WHO Report Details the Devastating Impact of Hypertension and Ways to Stop It," 2023). This condition is exacerbated by high sodium intake, which is common in junk food. High sugar and fat components in junk food can trigger insulin resistance, leading to increased blood sugar levels, which then increases the risk of diabetes. In 2021, there were about 529 million people with diabetes worldwide, and the number of deaths related to diabetes was about 37.8 million. It is estimated that by 2050, the number of people with diabetes worldwide will exceed 1.3 billion, and the age-standardized prevalence of diabetes in some regions may exceed 10% (Ong et al., 2023). Junk food usually contains a lot of salt (sodium), and high salt intake is a major factor in high blood pressure. Salt can cause elevated sodium levels in the body, leading to fluid retention, thereby increasing blood volume, increasing intravascular pressure, and ultimately leading to elevated blood pressure. (Grillo, et al,2019) Hypertension refers to blood pressure greater than or equal to 140 / 90 mmHg. According to data released by the U.S. Centers for Disease Control and Prevention (CDC) in October 2024, about 47.7 percent of adults aged 18 and older in the United States had high blood pressure between August 2021 and August 2023. The rate was 50.8 percent among men and 44.6 percent among women (Fryar et al, 2024).

Junior high school students are a very important age in life, because this is a period when the body grows in various ways, leading to a great increase in the demand for various nutrients. Because of its busy daily and convenient junk food, combined with many food choices, it is popular and can be bought quickly and conveniently in fast food restaurants and mobile phone takeout software. Research from the University of South Florida in the US shows that digital ordering platforms (such as apps and self-service ordering machines)

significantly influence consumer behavior, leading to more indulgent food choices and increased consumption. The study found that 61 per cent of digital orders were for unhealthy foods. (Biswas, et al,2024) The nutrition problems of teenagers are partly caused by improper consumption behavior. Excessive consumption of junk food can lead to a variety of health problems, such as high-sugar food, hamburgers, fried food, carbonated drinks and other junk food has become a common feature of the youth diet around the world. Typical diseases such as obesity, diabetes, hypertension and other diseases.

The fast-food industry originated in the United States, and has developed rapidly since the 1950s with the rise of fast-paced life and fast-food culture. At present, the fast-food industry has become a huge industry, covering hamburgers, fried chicken, pizza, sandwiches and other food types, as well as matching products such as beverages and desserts. According to the latest data, the market size of the global fast-food industry has exceeded 1.2 trillion US dollars (Statista, n.d.), among which the United States, China, Japan, Germany and other countries and regions are the main markets of the global fast-food industry. According to different catering service modes, the fast-food industry can be divided into self-service fast food, takeaway fast food, chain fast food and other types.

According to the 2020 Food Takeout Industry Report, China's food delivery industry has exceeded 650 billion yuan in 2019, an increase of nearly 40% compared with 2018, among which nearly 6 are from the post-1990s and post-1900s(Internet recruitment industry data analysis: China's Internet mobile recruitment user scale is expected to reach 238 million in 2020-IMedia Network-global new economy industry data analysis report publishing platform, n.d.). The top three consumers were fast food (22.1 percent), Western fast food (7.9 percent) and steamed bread and pastry (6.3 percent), while the growth rate of beverage takeout was very high, up 82.8 percent year on year. In 2020, the food delivery

industry was greatly improved due to the epidemic policy requirement to reduce travel (Statista, 2022). In 2023, the user scale of fast-food takeout in China will reach 534.88 million and the utilization rate of 49.6%, and in 2022, the online revenue of takeout will reach 1116.1 billion yuan. The rapid development of Chinese food delivery stores also reflects the personality characteristics of contemporary Chinese youth, which combines the fast pace and convenient lifestyle that relies on technology (Fortune Business Insights TM, n.d.).

Jilin Province, as an important province in Northeast China, has garnered significant public attention regarding the health of its students. According to the "Jilin Province National Nutrition Plan (2017-2030)," there is currently an increasing trend of nutritional chronic diseases among primary and secondary school students in the province. Poor dietary habits and insufficient knowledge about nutrition are among the main reasons. Siping City, as a key prefecture-level city in Jilin Province, represents a typical group of middle school students in Northeast China to some extent through their eating behaviors. Currently, most studies on junk food consumption in China focus on college students in large and medium-sized cities, such as Beijing, Shanghai, and Guangzhou. Research on students in smaller cities, especially those in junior high school, is relatively scarce. Particularly in Jilin Province and Siping City, systematic investigations into students' knowledge and behaviors regarding junk food consumption are even rarer. The lack of regional and foundational empirical data hinders targeted health education and policy interventions.

In conclusion, the rise in junk food consumption in China poses a significant threat to public health. The lack of knowledge about the long-term health consequences of poor dietary habits, combined with aggressive marketing and the convenience of junk food, has led to an increase in obesity, hypertension, and other chronic diseases. Addressing this issue requires a multi-faceted approach that includes education, regulation, and public health

interventions aimed at promoting healthier eating habits and reducing the prevalence of junk food consumption.

Objective

1. To study the knowledge and behavior of junk food consumption of students in the third middle school
2. To explore the factors related to the junk food consumption behavior of the students in the third middle school

Research question

1. How is the knowledge and behavior of the third middle school students in eating junk food?
2. What are the factors related to the junk food consumption behavior of third middle school students?

Hypothesis

1. The knowledge and behavior of students in the third middle school are at a medium level
2. The junk food consumption behavior of students in the third middle school is related with personal factors and knowledge level.

Operational definition

Junk food

Refers to food that is low in or lacks nutritional value. Typically, it is high in calories from sugar and fat but low in essential nutrients such as protein, vitamins, and minerals. These foods often contain additives such as preservatives, colorings, and flavor enhancers, which can have negative health effects when consumed in large amounts. Junk food commonly includes snacks like chips, sodas, sweets, fast food, and highly processed snacks. (Mirhadyan et al, 2019)

Junk food consumption behavior

Refers to the manner or patterns of consuming food categorized as junk food. This includes the number of junk food intake, the quantity consumed at each instance, or the choice to eat junk food in various situations. This behavior may be influenced by factors such as personal preferences, convenience, accessibility, or even advertising and promotional activities.

Knowledge of junk food consumption

Refers to the information and understanding an individual has regarding the consumption of junk food. This includes knowledge of the potential health impacts associated with eating junk food, the benefits and drawbacks of such foods, the main components of junk food, and how to choose healthier alternatives to consuming junk food.

Student

Refers to a junior high school student at Siping third Middle School in Jilin Province, China.

BMI

Refers to BMI is a numerical value calculated from an individual's weight and height, commonly used to assess whether a person has a healthy body weight relative to their height. It is calculated by dividing weight in kilograms by the square of height in meters(kg/m^2). According to the World Health Organization's BMI studards for Asian populations. The classification criteria are as follows(WHO,2000),under weight:＜ 18.5kg/m^2,normal weight:18.5-23.9kg/m^2, over weight:24.0-27.9kg/m^2, obesity: ≥ 28.0kg/m^2.

Congenital disease

Refers to the heterogeneous collection of congenital conditions (also known as birth defects) includes a wide range of diseases that are present from birth, as well as minor ones that do not cause major health problems (such as polydactyly).

Expected Benefits and applications

Personal level

Spam food usually contains high levels of calories, sugar, sodium, and unhealthy fat, which can easily lead to weight gain, increased blood sugar, and increased risk of cardiovascular disease(Y. Li et al, 2024). Through research, individuals can be aware of the health harm of junk food, so as to reduce the use of junk food and establish good health habits(Sahasakul et al, 2023). The data and analyses provided by the study can inform behavioral intervention strategies using the junk food population. For example, design more effective plans to reduce junk food use, provide more targeted health education, and in turn reduce the use of junk food.

Social level

The results of this study can provide a scientific basis for local governments and public health departments to develop more effective public health policies and address the harm of junk food use. The results can also be used to promote health education, thus reducing the use of junk food. This study will help the society to reflect on the junk food culture and encourage the society to value the health harm of junk food.

CHAPTER II

LITERATURE REVIEW

This chapter is a summary and is divided into five parts, as follows:

1. Junk food theory

    1.1 Garbage food definition

    1.2 Junk food harm

    1.3 The potential harm of junk food to the body

2. Junk food consumption behavior

3. Influencing factors of junk food consumption behavior

    3.1 Effect of junk food number on BMI

    3.2 Relations between region and junk food consumption behavior

    3.3 The cost of using the junk food each time

    3.4 Effect of junk food cognition on junk food number

4. Reasons for adolescent junk food behavior

    4.1 Time pressure

    4.2 Academic stress and social stress

    4.3. Regional differences

    4.4. Family environment

    4.5 Advertising and media influence

    4.6 Social circles

5. Related research

6. Conceptual Framework

Junk food theory

Garbage food definition

Consumption of junk food is increasing worldwide, including ultra-processed foods, fast food, unhealthy snacks, and sugar-sweetened beverages. (Baker, et al2020) Junk foods are characterized by their high levels of energy, fat, sugar, and salt, accompanied by low levels of micronutrients, fiber, and other bioactive compounds. (Chen, et al ,2020)

Junk food refers to fast food that is easy to make and eat, and Michael Jacobson (Michael Jacobson) properly coined the term junk food in 1972 to mean useless or low nutritional value. Junk food, or HFSS (high in fat, sugar or salt). The United States, Canada, the United Kingdom, Australia, Japan, Sweden and other countries have the largest junk food consumption in the world. But it has many harmful effects on the body, such as obesity, diabetes, heart disease and cancer.

Junk food usually contains a lot of calories per unit volume or weight, added sugars (such as sucrose, high glycan, syrup, etc.), Saturated, trans, and sodium salts. Junk food also often contains artificial colors, spices, and preservatives. (Forero, et al,2025)

High intake of added sugar is associated with an increased risk of obesity, type 2 diabetes, and cardiovascular disease. Too much sugar intake can lead to insulin resistance and metabolic syndrome. Sugar quickly gets into the blood stream, prompting the pancreas to produce more insulin to lower blood sugar levels. Prolonged high glucose intake leads to insulin resistance, increases body fat accumulation, and promotes the development of diabetes. (Liu, et al ,2023)

The saturated fats in junk food are mainly derived from animal fats and certain vegetable oils (such as palm oil). High-saturated fat intake leads to increased low-density lipoprotein cholesterol (LDL-C) levels, which increases the risk of heart disease. Trans fats, which are commonly found in partially hydrogenated vegetable oils, are associated with increased cardiovascular disease, diabetes, and inflammatory responses, which increase bad cholesterol (LDL-C) and reduce good cholesterol (HDL-C). Both fats are bad for your health. (Lust, et al,2023)

According to the recommendations of the World Health Organization (WHO) and other health agencies, daily sodium intake in adults should not exceed 2300 mg (mg), preferably limited to below 1500 mg, to reduce the risk of hypertension and cardiovascular disease. Junk food contains excessive sodium salt, and excessive sodium intake is closely associated with the risk of high blood pressure and cardiovascular disease, which can lead to fluid retention, increase blood volume, and thus increase blood pressure. In addition, high sodium intake may also affect heart function and vascular health. (Wang, et al ,2020)

Junk food harm

As the pace of life quickens and stress increases, junk food becomes more and more popular, and modern junk food appeals to younger children with its attractive fragrance and rich fat and protein. While junk food brings convenience, it also brings many health risks, which many people are unaware of.

1. Accelerated vascular aging. Jank food characterized by high fat, salt and fat is becoming a feature that attracts more consumers. Eating too much oil can easily lead to elevated cholesterol and blood lipids, while excessive salt can cause an increase in blood pressure. This condition can also lead to blood vessels prone to thrombosis, hardening and

narrowing, accelerate the aging of blood vessels, but also cause heart and brain diseases (Pant et al, 2023).

2. Accelerate the aging of the heart and brain. Jank food gives off an attractive creamy fragrance, in fact, this is related to the added essence, creamers, etc., junk food is easy to contain trans fatty acids, resulting in elevated blood lipids, induce cardiovascular and cerebrovascular diseases. In addition, some junk food also contains metal elements lead and aluminum, easy to damage the nervous brain system, children are easy to lead to intellectual development disorders, hyperactivity and other problems. For middle-aged and elderly people, memory will decline, and even related to the occurrence of Alzheimer's disease (Weinstein et al, 2025).

3. Accelerate liver aging. Jank food can also accelerate liver aging because it adds a lot of additives. Someone on the Internet has calculated that the average person eats about 4kg of additives a year. Although food additives are allowed to be used, there is no benefit to human health. If it is not excreted, it is easy to accumulate in the body. Moreover, the fat and heavy metals in junk food can be harmful to the liver and easily induce fatty liver (Ren et al, 2024). Accelerate liver aging and disease. Other foods that contain preservatives are not good for liver health.

4. Accelerate skin aging. Eating too much junk food is not good for the health of the skin, on the one hand, high salt is easy to lead to skin wrinkles and water loss, on the other hand, too much oil will lead to skin pores, oil and other conditions (He et al, 2025).

5. Accelerate the aging of joints. Obesity is a very high killer of joint diseases, obesity is not only the killer of heart disease, but also the killer of joint diseases, easy to increase the burden of joints. At the same time, junk food is also easy to contain purines,

which is the culprit of inducing ventilation and long-term adverse to joint health (T. Zhang et al, 2023).

The potential harm of junk food to the body

1. metabolic syndrome

Insulin resistance: The high sugar and fat components in junk food can trigger insulin resistance, leading to increased blood sugar levels, which increases the risk of diabetes (Mishra, 2023).

Fatty liver: A high-fat diet may lead to fat accumulation in the liver and form non-alcoholic fatty liver disease (NAFLD).

2. Bone health

Decreased bone mineral density: A high-salt diet affects the absorption and excretion of calcium, which may lead to decreased bone mineral density and increase the risk of fractures.

Osteoporosis: Chronic lack of essential nutrients (such as vitamin D and calcium) may lead to osteoporosis (Mishra, 2023).

3. mental health

Mood swings: A diet high in sugar can lead to mood swings and irritability. Sugar can affect the balance of neurotransmitters in the brain and affect mood.

Knowledge impairment: Long-term junk food consumption is associated with knowledge decline, possibly due in part to the long-term effects of diet on the brain (W. Yang et al, 2020).

Junk food consumption behavior

Heavy consumption of junk food is associated with a substantial reduction in the consumption of nutritious foods such as milk, fruits and vegetables, and some evidence even suggests that junk food is as addictive as alcohol and drugs, Increased junk food intake is a global phenomenon. It is considered an emerging major public health problem in all age groups, especially among young people. In the United States, about 92. 7% of children consume junk food daily, accounting for 17. 5% of their total energy intake, primarily consisting of sweets, savory snacks, and candies. (Liu et al, 2021) In the UK, since the COVID- 19 pandemic, Britons have increased their weekly calorie intake from takeout food by 50%, rising from 270 calories in 2019 to 400 calories in 2022.(Cooper et al, 2023)

Influencing factors of junk food consumption behavior

Effect of junk food number on BMI

1. The effect of the high-number consumption

Over energy: Regular consumption of junk food with high energy density can lead to long- term excess energy intake, which increases body fat and leads to increased BMI (Shim et al, 2023).

Slow metabolism: a high number of junk food consumption may reduce the body's metabolic rate, affecting the consumption of calories (Pan et al, 2023).

2. Long-term impact

Obesity epidemic: In western countries, junk food consumption is closely related to the prevalence of obesity. Studies have shown that every meal increase in the number of junk food consumption significantly increases the risk of obesity (Tareq et al, 2022).

Chronic diseases: A sustained rise in BMI is closely related to various chronic diseases (such as heart disease, diabetes, and some cancers), and long-term junk food consumption may exacerbate these health problems.

Relations between region and junk food consumption behavior

1. cultural difference

Traditional eating habits: Some areas prefer more home-cooked food or local ingredients, which may lead to lower acceptance of junk food.

Flavor preference: Different regions have different preferences for the taste and flavor of junk food, such as a salty diet in northeast China, spicy Sichuan and Chongqing regions, and light diet and soup food in southern China (Song, 2025).

2. pecuniary condition

Consumption power: Residents in economically developed areas have strong consumption power, high work pressure, and high number of using junk food.

Price competition: In economically underdeveloped areas, junk food restaurants may attract customers through price competition, such as discounts and promotions (Wikipedia contributors, 2024).

3. social environment

Urban and rural differences: junk food restaurants in cities are moredense and junk food services are more convenient, so consumers have more junk food number, while rural areas may have less junk food choices, consumers' junk food number decreases (Piao & Kim, 2024).

Lifestyle: In a fast-paced living environment (such as big cities), junk food provides fast and convenient eating choices and adapts to a busy lifestyle.

The cost of using the junk food each time

1. regional difference

Price level: the price level directly affects the price of junk food. For example, in high price areas, such as Beijing or Shanghai, China, fast food is usually expensive, while in small urban areas junk food is cheaper (Cost of Food and Dining in China – IKKY in China, 2024).

Cost of living: Junk food prices are usually higher in these areas because of higher rent and labor costs in these areas

2. Brand difference

International brands: International brands such as McDonald's, KFC, and Pizza Hut, where prices are usually higher than local fast-food restaurants, in part due to brand premium and high standards of supply chain management.

Local brands: Local brands may offer more affordable prices, usually with

3. The choice of food

Set meals and single order: Fast food restaurants often offer set meals, which are more cost-effective than single order food. For example, combination meals usually include the main course, side dish and drinks, with a price advantage over a single food (Dumas, 2024).

Additional services: Some fast-food restaurants provide additional services, such as dessert, extra seasoning packets and meal delivery services,

Effect of junk food cognition on junk food number

1. Healthy cognition

Knowledge acquisition: The more consumers know about the health effects of junk food, the more they are to reduce it. Education and advocacy can be effective in raising public knowledge of the potential health risks of junk food (Y. Li et al, 2022).

Behavior change: When individuals recognize the health risks of junk food, they may choose healthier eating options, or reduce the number of junk food (Didar loo et al, 2022).

2. dissemination of information

Media impact: Healthy eating-related ads, news coverage, and health advocacy messages on social media can influence consumers' diet choices. For example, uncovering targeting junk food health risks may lead to less junk food consumption (Nix, 2022).

Policy intervention: Government health policies and public health advocacy, such as restricting the advertising of high-sugar foods or introducing nutrition labels, can also affect consumers' perception and consumption behavior of junk food (Cardon et al, 2022).

3. Personal habits

Lifestyle: Personal lifestyle and health knowledge largely determine the number of their consumption of junk food. Those who focus health and stay fit are more inclined to reduce junk food consumption (Saeed et al, 2025).

Social support: Eating habits and support in family members and social circles can also influence individuals' choice of junk food. Interlineations with healthy people may prompt individuals to reduce junk food intake.

Reasons foradolescent junk food behavior

Time pressure

1. Academic burden: Teenagers face increasing academic pressure, which takes up a lot of time from schoolwork, homework to exam review. They may not have enough time to prepare healthy meals, and junk food is preferred for its convenience and speed (López-Gil et al, 2025).

2. Extracurricular activities: Extracurricular activities such as physical training, music lessons, club activities and so on will also make teenagers busy. Especially between these activities, they prefer to choose foods that are fast and easy to buy, such as junk food, snacks, etc. (Thoma et al, 2022).

3. Late return problem: Teenagers often come back late due to various activities or after-school remedial lessons. At this time, they often choose takeout or junk food normally because of hunger.

Academic stress and social stress

1. Test anxiety: Great psychological stress may feel during tests. Sugar and fats in junk foods quickly provide energy and a short sense of pleasure, making them a common choice for soothing anxiety (ElBarazi & Tikamdas, 2023).

2. Social stress: In social situations, teenagers may be influenced by their peers and tend to choose junk food to integrate into the group or to cater to their peers. Junk food and snacks that are common in social activities can also allow them to form consumption habits (Ounprasertsuk & Damuso, 2025).

Regional differences

1. Food availability: In some areas, especially in rural or poor areas, junk food may be less accessible and rare. In big cities, junk food is easily available and is more affordable (Sauer et al, 2021).

2. Economic factors: The price of junk food is usually lower than that of healthy food, which is especially important for families with poor economic conditions. Teens may choose cheaper junk food to save money (Siu et al, 2018).

Family environment

1. Eating habits: Family eating habits directly affect the dietary choices of adolescents. If the family is used to eating junk food, teenagers' dietary choices in the home environment will also be affected (Qiu et al, 2021).

2. Parents 'time and knowledge: Parents' long working hours and lack of knowledge of healthy diet may also lead to convenient and fast junk food(Mauch et al, 2022).

Advertising and media influence

1. Advertising: junk food advertisements often use colorful packaging, striking promotional activities and attractive spokesmen, especially for teenagers. These ads are highly attractive to teenagers through various media platforms (such as TV, the Internet, and social media) (Crowe, 2025).

2. THE Influence of Social Media: The sharing of junk food on social media, the promotion of web celebrity and food challenges further enhance teenagers' interest in and consumption of junk food (Qutteina et al, 2021).

Social circles

1. Peer influence: Teenagers are influenced by their friends and peers in their social activities, and friends who often eat junk food in their social circle will encourage them to choose similar foods (Bohara et al, 2021).

2. Group activities: In group activities such as parties and birthday parties, junk food such as pizza, French fries, and candy are usually common choices, which makes it easier for teenagers to eat junk food in these occasions.

Related research

Azemati,2018.iation between junk food consumption and cardiometabolic risk factors in a national sample of Iranian children and adolescents population: the CASPIAN-V study. Only a few studies have attempted to assess the relationship between junk food consumption and cardiometabolic risk factors in Iranian children and adolescents; therefore, the aim of our study was to determine the association between junk food intake and cardiometabolic risk factors in this population. This is a cross-sectional study. A total of 14,400 students were selected from 30 provinces of Iran using multistage, stratified cluster sampling method. Information about student's lifestyle, health behaviors and health status was obtained through a validated questionnaire. Blood pressure was measured and anthropometric indices were calculated. Blood samples were drawn from 3,303 students for biochemical tests. In our study, sugar-sweetened beverages, salty snacks, sweets and fast foods were considered as junk foods. The mean age of participants was 12.42 ± 2.97 years. Those with metabolic syndrome were more likely to live in urban areas ($P = 0.004$) and have higher BMI ($P < 0.0001$). Junk food intake was not related to metabolic syndrome; however,

it was associated with increased odds of high BP (OR 1.23, 95% CI 1.09, 1.39), high SBP (OR 1.38, 95% CI 1.09, 1.75), and high DBP (OR 1.18, 95% CI 1.04, 1.35), overweight (OR 1.22, 95% CI 1.08, 1.39) and excess weight (OR 1.14, 95% CI 1.04, 1.25).Junk food consumption plays an important role in childhood overweight and is related to high blood pressure in this population.

Chanh Yun Park ,2020.Corrigendum: Park C, Fang J, Hawkins NA, Wang G. Comorbidity status and annual total medical expenditures in U.S. hypertensive adults. This study analyzed data from the National Health and Nutrition Examination Survey (NHANES) between 2003 and 2016 to assess trends in the consumption of junk food among U.S. children and adolescents aged 2 to 19. Results showed that ultra-processed foods consistently contributed more than 65% of total caloric intake, with a slight decrease in sugar-sweetened beverage intake offset by increases in processed snacks and meats. Socioeconomic disparities persisted, with lower-income and racial/ethnic minority groups exhibiting higher levels of junk food consumption. Despite public health efforts, the high prevalence of junk food in youth diets highlights the urgent need for policy-level interventions, industry reformulation, and targeted nutritional education to reduce associated health risks.

Bohara et al,2021 Determinants of junk food consumption among adolescents in Pokhara Valley, Nepal. Investigate of Junk 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. It may lead to obesity and act as a risk factor for different non-communicable diseases (NCD's) like heart diseases, cardiovascular disease, cancer, hypertension, diabetes, etc. This study was carried out to explore the junk food consumption and its associated factors among adolescent students. A

cross-sectional study was conducted among 538 adolescent students of Kaski district, Nepal. We used a stratified proportionate sampling technique to recruit the participants. A self-administered questionnaire was used for data collection. Descriptive and bivariate statistical analysis was performed. The odds ratio was computed to test the association. The study found that more than half of the participants (60.30%) consumed junk foods over the last 30 days, more prevalent among public school participants (65.1%) followed by participants of private school (56.3%). More than half of the participants consumed salty snacks (58.7%) followed by sweets (57.5%). The time of consumption was found to be higher together with friends (83.9%). Similarly, it was consumed more while the participants were on a trip (70.1%). Consumption of junk foods among adolescent students was remarkably high in both public school and private school adolescents. Regardless of adequate knowledge on harmful consequences of junk foods, school-going adolescents are consuming junk foods due to its easy availability and ready-to-use packaging. The government of Nepal should strictly standardize and regulate advertising policies and extravagant health claims advertised by junk food manufacturers. An appropriate intervention targeted to adolescents to improve food behaviors is recommended.

Saba Tariq 2021, Relationship of BMI with Junk Food, sleep pattern, exam performance and awareness about its ill health effects in healthy teenagers. To evaluate the relationship of body mass index of healthy teenagers with junk food, sleep pattern, exam performance and knowledge about its ill effects. The cross-sectional study was conducted from March to June 2017 at University Medical and Dental College, University of Faisalabad, Faisalabad, Pakistan, and comprised subjects aged 13-19. Data was collected using face-to-face interviews, getting the examination results from respective educational institutions and calculating the body mass index, Data was analyzed using SPSS 22. Of the

226 subjects, 96(42.5%) were boys with a mean age of 15.68 ±1.83 years, and 130(57.5%) were girls with a mean age of 17.00±1.74 years. Based on body mass index, 35(15.5%) subjects were underweighted, 88(39%) were normal, 28(12.4%) overweight, 56(24.7%) pre-obese and 19(8.4%) were obese. The independent predictors of body mass index were higher consumption of soft drinks in males and higher consumption of soft drinks and salt in females ($p<0.05$). Teenagers were found to be well aware of the ill effects of junk food, but they were found to be happy with their dietary habits and unwilling to change it.

Yanatchara Chaiwut,2021.Factors associated with junk food consumption among Department of Community Health students in University in the Northern. The survey research to study factors related to the consumption habits of the community health students. University of northern Thailand a sample of 270 people, stratified random sampling, collected data using questionnaires. Analyze data with descriptive statistics, percentage statistical using Chi-square Test. The results showed that the sample was female 74.4% , Age 20 years 27.8%, the second year 26.3%, normal BMI 62.2%, Family income 15,001 Bath more 91.1%, Student income over 5,000 Baht/month 58.9%, no disease 93.0%, domiciled in the North 52.6%, Knowledge, Attitude, Low Dietary Intake 94.8% and 92.6%, relationship analysis showed that age, family income, attitude, factors contributing to the hostel, housing contributing factors, auxiliary factors, member supplement factors. and additional media inputs. Statistically significant consumption of food at p-value ≤ 0.05 gender, year class studied, BMI, student income, disease domicile, general knowledge of the consumption of food, environmental contributing factors and group supplementary factors. No relationship In summary, the students had moderate food consumption behavior., with age, family income, attitude, factors contributing to the dormitory, housing contributing factors, supplementary factors, member supplement factors. and additional media inputs. It is

associated with the consumption of food. Family, role in promoting knowledge in the consumption of the student's junction food.

Man et al, 2021, Is fast-food consumption a problem among adolescents in Malaysia? An analysis of the National School-Based Nutrition Survey, 2012.Fast-food consumption is an unhealthy dietary behavior because it increases the risk of diet-related chronic diseases. We aimed to investigate factors associated with fast-food consumption, namely sociodemographic characteristics, body mass index-for-age, meal away from home habit, and intake of various food groups among adolescents in Malaysia. We analyzed data from the National School-Based Nutrition Survey (NSNS). The NSNS was a nationwide, cross-sectional survey. Multiple-stage stratified cluster random sampling method was applied to obtain a representative sample of adolescents' population. This study recruited adolescents aged 10–18 years who were attending schools. Pre-tested self-administered questionnaires in Malay language were used to obtain relevant information. Number of fast-food consumption per week was classified into three groups: "consumed fast-food four to seven days", "consumed fast-food one to three days", and "did not consume fast-food". Intake of food groups was assessed by self-administered food number questionnaire. Descriptive and complex sample multinomial logistic regression analyses were performed in data analysis. A total of 26,383 from 40,012 selected adolescents completed all the relevant questions for this study. Of those surveyed, 13.5% of the respondents consumed fast-food 4 to 7 days, 69.3% of the respondents consumed fast food 1 to 3 days, and 17.2% of them did not consume fast-food in a typical week. Number of fast-food consumptions (4 to 7 days and 1 to 3 days per week) was significantly associated with age; sex; ethnicity; locality of schools; number of eating out; and not consuming recommended intake of cereals or grains, vegetables, and meat or poultry or eggs. In conclusion, age; sex; ethnicity; locality of schools; number of eating

out per week; imbalanced intake of cereals or grains, meat, or poultry or eggs; and inadequate vegetable intake were significantly associated with fast-food consumption among adolescents in Malaysia. The findings of this study will be useful for policy makers in promoting healthy food choices among adolescents in Malaysia.

Shah et al, 2022, investigates the knowledge and behavior of private school adolescents related to junk food. Adolescents are a vulnerable group prone to developing unhealthy eating habits, especially as the supply of junk food on the market continues to increase. Private schools, typically offering comfortable environments and high-income families, may also influence adolescents' eating behaviors. Therefore, this cross-sectional study aims to investigate the knowledge and behavior related to junk food among adolescent students at a private school. A cross-sectional descriptive study was conducted among adolescent students at Shree Phuleshwar Public Middle School English School Kalyanpur, Saptari, with samples collected from students present during data collection. After their consent, respondents received a self-administered structured questionnaire. Knowledge was graded; mean scores, standard deviations, frequencies, percentages, and chi-square tests were used to analyze the data using SPSS 16.0. The average knowledge score for participants was 5.80, with a standard deviation of 1.26. Similarly, the average practice score was 7.07, with a standard deviation of 1.20. A total of 60 people participated in this study. The results showed that 31.7% of participants had good knowledge, 31.7% had average knowledge, and 36.7% had poor knowledge. In terms of practice, 35.0% of participants performed well, while 65.0% performed poorly. The knowledge level of adolescent students at Kalyanpur school is generally low, with only a small portion having good knowledge. Similarly, the practice level is poor, with most participants having low-quality practices.

Gketsios et al,2022 investigate the impact of environmental influences on Greek preadolescents' junk food consumption. A cross-sectional study, was conducted among 1718 preadolescents (mean (standard deviation (SD)) age: 11.2(0.8) years old; 54% girls) and their parents, during the school years 2014–2016. Parental and child characteristics were collected anonymously, through self-administered and validated questionnaires. Among others, junk food consumption was recorded, classifying children as low, moderate, and high consumers. The majority of the preadolescents were classified as at least moderate junk food consumers, while almost 3/10 children were classified as high junk food consumers. A significantly lower junk food consumption was observed among preadolescents with a healthier family environment, consisting of normal-weight parents who consume junk foods less frequently, prefer home-cooked meals and adhere more to the Mediterranean diet, while more frequent family meals were also associated with lower junk food consumption. In addition, influence from teachers and participation in extracurricular sports activities were significantly associated with lower junk food consumption, while advertisements were found to have a significant negative impact on preadolescents' eating habits. Notwithstanding, peers were not found to influence their dietary choices in terms of junk food consumption. Both parents and teachers seem to be positive influencers on preadolescents' low junk food consumption. The detrimental role of advertisements on junk food consumption is reconfirmed, while peers' influence is not significant on junk food consumption. The need for urgent public health initiatives for the promotion of healthy dietary habits among preadolescents is warranted.

Upreti et al,2022.Multilevel factors appealing to junk food consumption among school children and adolescents: A systematic revie. Junk food consumption (JFC) is increasing and it is common mostly among schoolchildren and adolescents (SCA). The consequences of JFC have become a public health concern. The study aims to explore the

factors associated with the JFC among SCA using the socioecological model (SEM). Electronic databases such as PubMed, Google Scholar, ResearchGate, and bibliographic references were used to obtain the related papers following the standard process of identification, screening, eligibility assessment, study quality assessment, and data extraction from the selected articles. Strengthening the reporting of observational studies in the epidemiological (STROBE) checklist was used to assess the quality standards of the papers. The findings of the study indicate that JFC behavior among the SCA is influenced by multilevel factors that extend from intrapersonal to public policy through interpersonal, organizational, and community levels. The results of the study suggest that more than two-thirds, more than one-third, near to one-third, and half of them supported with microsystem, mesosystem, ecosystem, and macrosystem constructs of the SEM respectively. However, age, sex/gender, taste and pleasure of eating junk food, knowledge of junk food and attitude towards dietary choices of the microsystem (individual factors) and mass media exposure and marketing strategies of the macrosystem (public policy factors) remain the most influencing systems. The results indicate that individual and public policy level constructs are important to explaining JFC among the SCA. This implies that the researchers and policymakers need to consider multilevel factors while designing and implementing the school-based nutrition education programmed to promote healthy dietary outcomes in the SCA.

Singh et al,2023, Dynamics of junk food consumption with central and general obesity: a cross-sectional study among adolescent Tibetan girls in India. Deterioration in health due to junk food consumption is a global concern, with adolescents at a greater risk. A cross-sectional study was conducted to understand the dynamics of junk food consumption with obesity in adolescent Tibetan girls (13–18 years; N = 276) of Himachal Pradesh, India.

A pretested schedule and anthropometric measurements were used for data collection. Descriptive and bivariate analysis was done. The odds ratio was the determined. The study found that 45.28% of the girls consumed some form of junk food. Also, 25.4% and 16.3% were also centrally obese according to waist–hip ratio (WHR) and waist–height ratio (WHtR) respectively. Girls who consumed junk food were found to be at a greater risk (WHR: OR = 7.942, 95% confidence interval (CI) = 4.132–15.262; WHtR: OR = 3.652, 95% CI = 1.820–7.327 at $P < 0.001$) of developing abdominal obesity. Frequent consumption of junk food was found to be remarkably high (77.60%) among the studied population. It is of utmost importance to prioritize implementation programmed on healthy eating habits through various government and non-government agencies in order to improve health among adolescents.

Lichenlu ,2023 Fast food industry current situation analysis and future trend the fast-food industry will continue to maintain a rapid growth trend, is an industry full of opportunities and challenges. In the future, the fast-food industry needs to pay more attention to the development of brand innovation and diversification, health and nutrition, environmental protection and sustainable development, technology and digitalization. At the same time, the fast--food industry also needs to pay more attention to the needs and preferences of consumers, and provide more personalized, convenient and fast services.

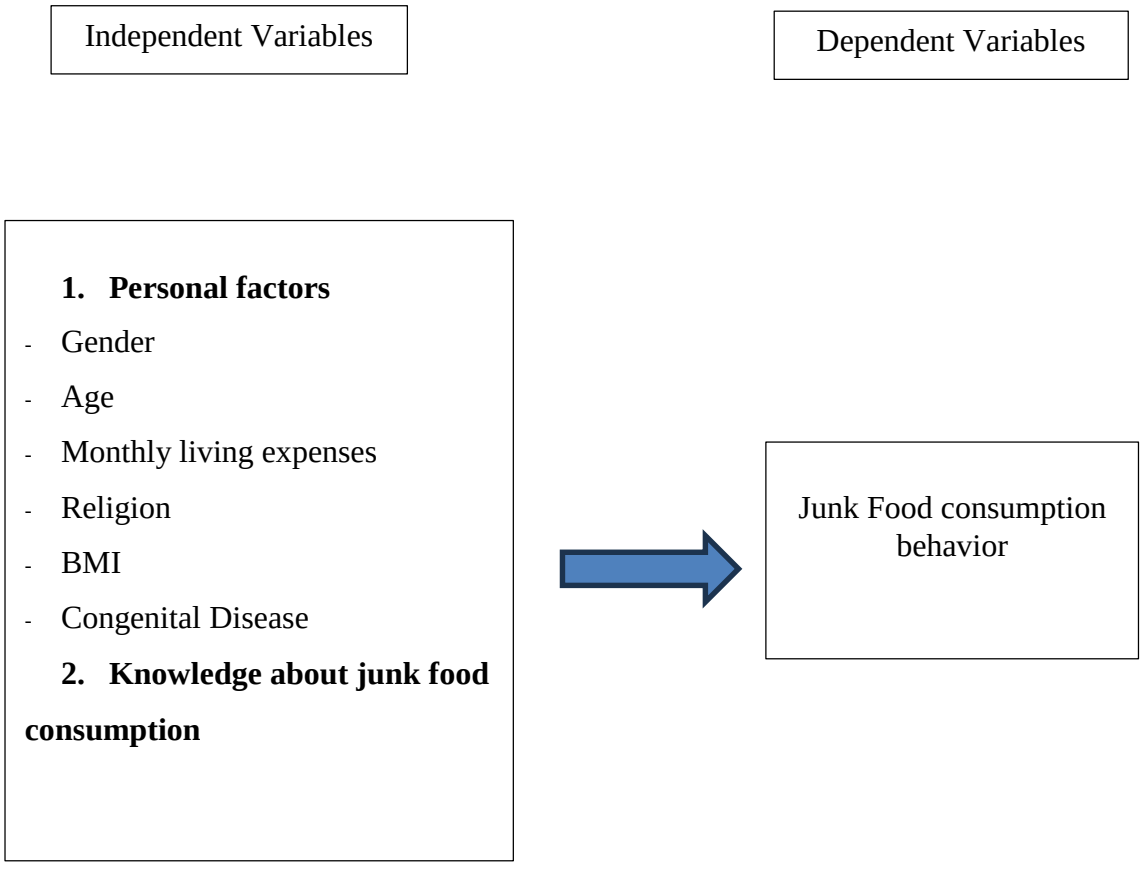
Wangxiuli,2023 The total food consumption of junior middle school students in Beijing is not lower than the recommended dietary level, and the distribution of three meals is more reasonable; In terms of the structure of food consumption, the proportion of plant food and animal food consumption is roughly 1:2; Snack consumption is an essential energy supplement for this group. In the selection of snacks, they mainly focus on taste and prefer sweets. The shopping places are mainly small shops and snack stalls near the school. It is

necessary to regulate the snack stalls around the campus, prevent their nutritional risks and health risks, and promote food education, improve students' food nutrition literacy, guide students to form healthy food consumption habits, and promote their healthy growth.

upt al, 2024. Factors associated with consuming unhealthy food in school children: A population-based study from Hong Kong. Unhealthy diets were found to be the main contributor to the overweight problem among adolescents. In this study, we aim to identify the factors causing unhealthy eating habits in adolescents. School-aged children and adolescents participated in this cross-sectional observational study with additional school and parental consent. A self-administered survey was conducted by 30 primary schools and 25 secondary schools. Participants were asked about the number of consuming unhealthy food and the types of unhealthy food consumed. A descriptive analysis was performed to demonstrate the proportions of characteristics. The prevalence of the outcome among participants of various factors was also analyzed using separate binary regression models. A total of 4884 responses were collected. Among primary school students (grade 4, mean age: 10.06), people who (1) were actively gaining weight (a OR: 1.651, 95% CI 1.006–2.708, $p = 0.047$), (2) went to bed after 11 p.m. (a OR: 1.652, 95% CI 1.065–2.563, $p = 0.025$), (3) had more than 2 h of gaming (a OR: 2.833, 95% CI 1.913–4.195, $p < 0.001$), (4) suffered from self-report depressive symptoms (a OR: 1.753, 95% CI 1.233–2.493, $p = 0.002$) was more likely to consume unhealthy food. As for secondary school students (grade 3, mean age: 15.28), (1) males (a OR: 1.266, 95% CI 1.0004–1.601, $p = 0.0496$), (2) average-to-high socioeconomic status (Average: a OR: 1.471, 95% CI 1.115–1.941, $p = 0.006$; High: a OR: 2.253, 95% CI 1.585–3.202. $p < 0.001$), (3) having more than 2 h of gaming (a OR: 1.342, 95% CI 1.069–1.685, $p = 0.011$), (4) suffering from psychological distress (a OR: 1.395, 95% CI 1.051–1.852, $p = 0.021$) were associated with

the increased odds of consuming unhealthy food. Several lifestyle and health factors were significantly associated with unhealthy eating behaviors in school-aged children and adolescents in Hong Kong, sharing similarities with many other countries. In conjunction with implementing a policy that addresses factors for unhealthy eating habits, further research should investigate potential interventions targeting these factors to ultimately tackle the overweight and obesity concern for children and adolescents in Hong Kong

Conceptual Framework



CHAPTER III

RESEARCH METHODOLOGY

This chapter systematically investigates and analyzes the cognition and consumption behavior of students in Si Ping City, Jilin Province, to provide scientific basis for relevant public health departments and improve cognition. This study is divided into the following parts:

1. Research design
2. Population and sample size
3. Study area
4. Study period
5. Research method
6. Measurement instruments
7. Data collection
8. Data analysis

Research design

The research design was a cross-sectional analytical study design.

Population and sample size

Population

The subjects of this study were 1560 students in the third experimental middle School of Si Ping City, Jilin Province.

Table 1 Population and sample size

Class	number of people	amount to
Class 1	68	
Class 2	70	
Class 3	66	
Class 4	69	
Class 5	68	
Class 6	66	
Class 7	65	
Class 8	69	
Class 9	70	
Class 10	66	
Class 11	70	
Class 12	69	1560
Class 13	68	
Class 14	66	
Class 15	68	
Class 16	69	
Class 17	65	
Class 18	66	
Class 19	70	
Class 20	69	
Class 21	68	
Class 22	65	
Class 23	70	

Sample size

The population used in the study was 1560, and the slope did not exceed 5**%**, or 95**%** confidence level, so in this study we used the following methodology for calculations**.** Yamane (1967)

$$n = \frac{N}{1 + Ne^2}$$

- n = sample size
- N = population size (1560 students)
- e = margin of error (often set at 0.05 for a 5% margin of error)

$$n = \frac{1560}{1+1560 \times 0.05^2}$$

$$n = \frac{1560}{1+1561 \times 0.0025}$$

$$n = \frac{1560}{1+3.9}$$

$$= 318.36$$

To calculate the sample size with an additional 10% to account for potential non-responses or other issues, you can use the following method:

First, 10% of the sample size was calculated:

10% of 318=318×0.10=32

This 10% is then added to the original sample size:

318+32=350

The sample size was determined by using the TaroYa-mane's formula, and the final sample size was about 350 students.

To calculate the proportional allocation of junior high school students from each class, you need to determine the proportion of the total population each class represents and then apply this proportion to the total sample size. The formula for proportional allocation is:

$$n_i = \frac{N_i}{N} \times n$$

Where:

- n_i represents the sample size for each educational level.
- n is the total sample size.
- N_i is the population size for each educational level.
- N is the total population size.

Therefore, the probabilities of selecting students in each class are shown in Table 1.

Sampling

This study employed simple random sampling (SRS) to select the sample. The sampling process was conducted during a school parent meeting. Questionnaires were distributed with the cooperation of teachers, parents, and students who voluntarily agreed to participate in the study. To ensure the authenticity and reliability of the data, students were instructed to use their parents' mobile phones to scan a QR code and complete the questionnaire in a face-to-face setting. Questionnaire collection was organized separately in each classroom at different times, based on convenience and appropriateness.

Inclusion and Exclusion Criteria

Inclusion Criteria

1. Students with normal comprehension ability, capable of reading, speaking, and writing.

2. Students who voluntarily agreed to participate in the study after fully understanding its objectives and procedures.

Exclusion criteria

1. Students with language communication disorders or a history of mental illness.

2. Students who were uncooperative or unable to appropriately complete the questionnaire.

Study area

The Third Middle School In Siping City, Jilin Province

Study period

During the study period from November 2024 to February 2025, questionnaires were distributed to Jilin Province Si Ping city third experimental middle school to conduct a survey during this period. The data were collected, analyzed, and summarized.

Research method

1. Literature review method

1.1 Around the research objective: Combined with the core objective of the research, namely, to investigate the influencing factors of junk food consumption behavior in the Third Experimental Middle School of Siping City, Jilin Province, the paper, books and other relevant literature reviewed at home and abroad are integrated.

1.2 Keyword search: "junior high school students", "consumption behavior", "cognition", "influencing factors" as keywords, and search in Chinese and English databases such as CNKI, Wanfang Paper Database, WIPO, PubMed, Google Scholar, etc.

1.3 Literature collation and analysis: Collect and sort out the relevant literature on junk food consumption behavior, focusing on the research results of the influencing factors of junk food consumption behavior (such as personal factors, cognition of junk food, congenital diseases, etc.), so as to provide reference for questionnaire design and data analysis framework.

2. Questionnaire survey method

2.1 Questionnaire design: On the basis of literature review, a questionnaire was designed for the junk food consumption behavior of students in the Third Experimental Middle School of Si Ping City, Jilin Province. The questionnaire consists of three parts:

Part 1: Part I: Personal factors (gender, age, monthly living expenses

, religion, BMI, congenital diseases)

Part II: Knowledge about junk food consumption

Part III: Junk food consumption behavior (the number of consumption of junk food and the choice of junk food.

2.2 Questionnaire evaluation: The validity of the questionnaire will be evaluated before the formal release, and necessary modifications and improvements will be made according to the feedback.

2.3 Questionnaire collection: Offline (paper questionnaire) questionnaires were distributed to senior three students of the Third Experimental Middle School in Si Ping City, Jilin Province to ensure the breadth and representativeness of the samples.

3. Mathematical and statistical methods

3.1 Pre-process data according to inclusion and exclusion criteria and check for anomalies to ensure data validity and authenticity.

3.2 Enter valid data into Excel to establish a database and analyse using SPSS 26.0 software (Chinese version).

3.3 Conduct descriptive statistical analysis, p-value of <0.05 is considered statistically significant.

4. Quality control

4.1 Ensure data authenticity and completeness using a combination of online and offline surveys with strict quality control measures.

4.2 Confirm the validity and reliability of the Chinese version 6.0 of the EDE-Q6.0 through prior studies.

4.3 Distribute questionnaires to targeted groups without using suggestive or leading language.

4.4 Use a double-entry method and strict logical checks to filter and exclude invalid questionnaires.

Measurement instruments

The questionnaire used in this study consists of three main sections as follows

Section 1 Personal factors

This part includes gender, age, monthly living expenses, religion, BMI, congenital diseases

Section 2 Knowledge about junk food consumption

The Bloom Taxonomy is converted into percentages and grouped according to knowledge levels to evaluate students' achievement. This section includes 12 questions, with correct answers scoring 1 point and incorrect answers scoring 0 points, for a total of 12 points. The method divides these levels into three tiers: lower-order knowledge (0-60%), middle-order knowledge (61-70%), and higher-order knowledge (80% and above).

Table 2 Students' knowledge level of junk food consumption is graded

Score	Level
0-7	Low
8-9	Moderate
10-12	High

Section 3 Junk food consumption behavior

The Bloom Taxonomy is converted into percentages and grouped according to the level of consumer behavior to evaluate students' outcomes in consumption behavior. This section includes 20 questions, with daily occurrences always scoring 4 points, often

occurrences 3 points, sometimes occurrences 2 points, and never occurring 0 points, totaling 80 points. The method divides these levels into three tiers: low-level consumption behavior (0-60%), mid-level consumption behavior (61-70%), and high-level consumption behavior (80% or above).

Table 3 Students' consumption behavior of junk food was graded

Score	Level
20-48	Low
49-63	Moderate
64-80	High

Data collection

1. In this study, researchers will conduct surveys during parent-teacher meetings at school with the consent of teachers, parents, and students. Students are allowed to use their parents' phones to scan QR codes face-to-face and fill out the questionnaire to ensure its authenticity. Questionnaires will be distributed to each class at different times, collected, and the number of questionnaires ensured.

2. The questionnaire used for data collection has been validated by three experts, with a validity score of >0.5, and its reliability has been calculated from a sample group like the target population of the research, consisting of 30 individuals, the reliability score was 0.853.

3. Verify the accuracy and completeness of the data obtained from the questionnaires.

4. Compile the data and conduct statistical analysis.

Data analysis

1. Excel was used for data entry and SPSS was used for statistical data analysis to analyze the related factors of students' consumption behavior in Jilin Province.

2. Descriptive analysis, summarizing the congenital characteristics, knowledge levels, and consumption behavior levels of the sample. Demographic information: using number and percentages to describe the distribution of demographic variables (such as age, gender, monthly living expenses, religious beliefs, BMI, congenital diseases). knowledge level: calculating questionnaire scores and determining participants 'knowledge levels through number and percentages. Consumption behavior level: calculating questionnaire scores and determining participants' consumption behavior levels through number and percentages.

3. Chi-square test, each independent variable was analyzed separately to determine its relationship with junk food consumption behavior.

CHAPTER IV

RESULTS

This research is a study of the knowledge and behavior and explores the relevant factors of the junk food consumption behavior of the students in the third middle school. Data was collected from a sample of 350 individuals, selected using stratified sampling. The data collection instrument was a questionnaire. The data collected were analyzed, and the results of the analysis can be categorized as follows:

1. General Information of the Respondents

2. Analysis of Knowledge about junk food consumption among Students in Jilin province, Chaina.

3. Analysis of Junk food consumption behavior Among Students in Jilin province, Chaina.

4. Analysis of relevant factors of the junk food consumption behavior among Students in Jilin province, Chaina.

General Information of the Respondents

In this study, the researcher selected the sample using stratified sampling, proportionally allocating the sample based on the number of students in Jilin Province, China. The results of the data collection provide the general information of the sample group as follows:

Table 4 Number and Percentage of the Sample Group Classified by Gender.

Gender	Number	Percentage
Male	142	40.57
Female	208	59.43
Total	**350**	**100.00**

Table 4 It can be observed that the majority of the sample in this study are Female, with a total of 208 individuals (59.43%), while the participants account for 350 individuals (100%).

Table 5 Number and Percentage of the Sample Group Classified by Age.

Age	Number	Percentage
13	95	27.14
14	115	32.86
15	90	25.71
16	50	14.29
Total	**350**	**100.00**

Table 5 It can be observed that the majority of the sample in this study are 14 years old, with a total of 115 individuals (32.86%), while the participants account for 350 individuals (100%).

Table 6 Number and Percentage of the Sample Group Classified by Monthly living expenses

Monthly living expenses	Number	Percentage
<150 yuan	94	26.86
150 yuan- -300 yuan	100	28.57
300 yuan- -450 yuan	95	27.14
> 450 yuan	61	17.43
Total	**350**	**100.00**

Table 6 It can be observed that the majority of the sample in this study are 150yuan- -300 yuan, with a total of 100 individuals (28.57%), while the participants account for 350 individuals (100%).

Table 7 Number and Percentage of the Sample Group Classified by Religion.

Religion	Number	Percentage
Buddhism	22	6.29
Islam	18	5.14
Christianity	10	2.86
Other	300	85.71
Total	**350**	**100.00**

Table 7 It can be observed that the majority of the samples in this study are no religious belief, with a total of 300 individuals (85.71%), while the participants account for 350 individuals (100%).

Table 8 Number and Percentage of the Sample Group Classified by BMI.

BMI	Number	Percentage
＜18.5	75	21.43
18.5-23.9	110	31.43
24-28	104	29.72
＞28	61	17.42
Total	**350**	**100.0**

Table 8 It can be observed that the majority of the samples in this study are BMI=18.5—23.9, with a total of 110 individuals (31.43%), while the participants account for 350 individuals (100%).

Table 9 Number and Percentage of the Sample Group Classified by Congenital Disease.

Congenital Disease	Number	Percentage
Yes	47	13.43
No	303	86.57
Total	**350**	**100.00**

Table 9, It can be observed that the majority of the samples in this study are no congenital disease, with a total of 303 individuals (86.57%), while the participants account for 350 individuals (100%).

Analysis of Knowledge about junk food consumption among Students in Jilin province, Chaina.

Table 10 Number and percentage of knowledge about junk food consumption among students categorized by correct and incorrect responses.

Knowledge questions about junk food consumption.	**Correct respondents.**		**Incorrect respondents.**	
	Number	**Percentage**	**Number**	**Percentage**
1. What does junk food refer to	236	67.43	114	32.57
2. What is a typical characteristic of most junk food.	235	67.14	115	32.86
3. What health effect can excessive junk food consumption have?	225	64.29	125	35.71
4. Which type of junk food usually has the highest calorie content.	215	61.43	135	38.57
5. Why does junk food often have an appealing taste.	240	68.57	110	31.43
6. How should junk food consumption be limited.	232	66.29	118	33.71

Table 10 (Continued)

Knowledge questions about junk food consumption.	Correct respondents.		Incorrect respondents.	
	Number	**Percentage**	**Number**	**Percentage**
7. What is the risk of consuming beverages that come with junk food.	237	67.71	113	32.29
8.Which type of junk food has the highest trans-fat content	224	64.00	126	36.00
9.What should be particularly considered when choosing junk food.	221	63.14	129	36.86
10.Which type of junk food often has a high sodium content.	196	56.00	154	44.00
11.Which type of junk food typically has a high protein content.	207	59.14	143	40.86
12.What can reduce junk food consumption help decrease the risk of?	61	17.43	289	82.57

From table 10, it can be observed that in this study, most samples of the questions were correct, with the largest sample, 240 (68.57%) and the smallest sample, 61 (17.43%).

Table 11 Number and percentage of respondents categorized by the level of knowledge about junk food consumption.

Knowledge level.	Score range	Number	Percentage
Low knowledge.	0 -6	136	38.86
Moderate knowledge	7-8	143	40.86
High knowledge.	9-12	71	20.28
Total		**350**	**100.00**

From table 11, the knowledge level is divided into three tiers. The score for low level knowledge ranges from 0-6, with 136 individuals (38.86%) scoring this, making it the smallest sample. For moderate knowledge levels, the scores range from 7-8, with 143 individuals (40.86%) scoring this, representing the largest proportion of the sample. High level knowledge scores range from 9-12, with 71 individuals (20.28%) scoring this.

Analysis of Junk food consumption behavior Among Students in Jilin province, Chaina.

Table 12 Number, percentage, mean, and standard deviation of respondents categorized by food consumption behavior on each item.

	Statement	Number (Percentage)				$\overline{X}$	S.D.
		Never	Sometimes	Often	Always		
1	You eat sweets such as ice cream, cookies, and cake every day.	61 (17.43)	121 （34.57）	127 （36.29）	41 （11.71）	2.42	0.911
2	You eat snacks every day	83 (23.71)	121 （34.57）	95 （27.14）	51 （14.57）	2.33	0.994
3	You regularly eat fast food such as pizza, hamburgers, and sandwiches.	69 (19.71)	113 （32.29）	113 （32.29）	55 （15.71）	2.44	0.979

Table 12 (Continued)

	Statement	Number (Percentage)				$\overline{X}$	S.D.
		Never	Sometimes	Often	Always		
4	You order fast food for delivery to your residence.	71 (20.29)	131 (37.42)	98 (28.00)	50 (14.29)	2.36	0.962
5	You eat fried or very greasy food.	72 (20.57)	114 (32.57)	107 (30.57)	57 (16.29)	2.43	0.992
6	You like eating fast food such as fried chicken and French fries.	68 (19.43)	111 (31.71)	131 (37.43)	40 (11.43)	2.41	0.928
7	You often celebrate occasions with friends and family at fast food restaurants.	61 (17.43)	111 (31.71)	132 (37.71)	46 (13.14)	2.47	0.929

Table 12 (Continued)

	Statement	Number (Percentage)				$\overline{X}$	S.D.
		Never	Sometimes	Often	Always		
8	You use fast food services in shopping malls.	75 (21.43)	116 (33.14)	108 (30.86)	51 (14.57)	2.39	0.980
9	When you need something quick, you choose ready-made food.	62 (17.71)	98 (28.00)	140 (40.00)	50 (14.29)	2.51	0.945
10	You like drinking canned vegetables and fruit juices.	85 (24.29)	109 (31.14)	114 (32.57)	42 (12.00)	2.32	0.973
11	You enjoy eating Western-style food.	91 (26.00)	79 (22.57)	115 (32.86)	65 (18.57)	2.44	1.068
12	You drink soft drinks with fast food.	47 (13.43)	120 (34.29)	143 (40.86)	40 (11.42)	2.50	0.866

Table 12 (Continued)

	Statement	Number (Percentage)				$\overline{X}$	S.D.
		Never	Sometimes	Often	Always		
13	You drink sugary drinks instead of water.	74 (21.14)	110 (31.43)	115 (32.86)	51 (14.57)	2.41	0.979
14	You consume fast food as a main meal.	80 (22.86)	118 (33.71)	113 (32.29)	39 (11.14)	2.32	0.979
15	You only eat at the school cafeteria.	87 (24.86)	88 (25.14)	128 (36.57)	47 (13.43)	2.39	1.003
16	You choose fast food primarily based on price.	67 (19.14)	116 (33.14)	133 (38.00)	34 (9.71)	2.38	0.903
17	You choose fast food primarily based on nutritional value.	49 (14.00)	142 (40.57)	103 (29.46)	56 (16.00)	2.47	0.923

Table 12 (Continued)

	Statement	Number (Percentage)				$\overline{X}$	S.D.
		Never	Sometimes	Often	Always		
18	You choose fast food based on the restaurant's promotions.	84 (24.00)	82 (23.43)	127 (36.29)	57 (16.28)	2.45	1.028
19	You choose fast food based on new advertisements or online reviews.	77 (22.00)	103 (29.43)	115 (32.86)	55 (15.71)	2.42	1.001
20	You order multiple fast-food items per meal.	53 (15.14)	119 (34.00)	134 (38.29)	44 (12.57)	2.48	0.898

From table 12, it can be observed that respondents' junk food consumption behavior on each item mostly fell within the "Fair behavior level," with mean scores ranging between 2.32 and 2.48. However, two items were identified in the "Good behavior level": item 9 ("When you need something quick, you choose ready-made food"), with a mean of 2.51, and item 12 ("You drink soft drinks with fast food"), with a mean of 2.50. The items

with the lowest mean scores were item 2 ("You eat snacks every day") and item 14 ("You consume fast food as a main meal"), both having mean scores of 2.32, indicating that these behaviors require the most improvement. Additionally, the standard deviation (S.D.) values for each item ranged from 0.866 to 1.068, suggesting that respondents' answers were relatively consistent across all items.

Table 13 Number and percentage of respondents categorized by level of junk food consumption behavior.

Behavior level.	**Score range.**	**Number**	**Percentage**
Low behavior	20-48	55	15.71
Moderate behavior	49-63	143	40.86
High behavior	64-80	152	43.43
Total.		**350**	**100.00**

From table 13, the respondents' consumption behavior towards junk food is categorized into three levels. "Low behavior" has a score range of 20-48 points, with the fewest participants, totaling 55 people (15.71%). "Moderate behavior" has a score range of 49-63 points, with the most participants, totaling 143 people (40.86%). High behavior has a score range of 64-80 points, with 152 participants (43.43%).

Analysis of relevant factors of the junk food consumption behavior among Students in Jilin province, Chaina.

Table 14 Relationship between personal information factors and students' junk food consumption behavior.

Factors	Behavioral level			Total	χ^2	P-value
	Low	Moderate	High			
Gender						
Male	79	52	11	142	1.770	0.413
Female	129	68	11	208		
Age						
13-14 years	139	65	6	210	23.188	0.001
15-16 years	69	55	16	140		
Monthly living expenses						
<300 yuan	120	71	3	194	28.134	0.000
> 301 yuan	88	49	19	156		
Religion						
Buddhism	14	7	1	22	3.715	0.715
Islam	11	7	0	18		
Christianity	8	2	0	10		
Other	175	104	21	300		

Table 14 (Continued)

Factors	Behavioral level			Total	χ^2	P-value
	Low	Moderate	High			
BMI						
<18.5	47	28	0	75	35.495	0.000
18.5-23.9	73	36	1	110		
24-28	57	39	8	104		
＞28	31	17	13	61		
Congenital Disease						
Yes	26	18	3	47	0.410	0.815
No	182	102	19	303		

* < 0.05

From Table 14, the following observations were made:Age, monthly living expenses, BMI and p-value <0.01 were significant.

Table 15 Relationship between knowledge factors and students' junk food consumption behavior.

Knowledge factors	**Behavioral level**			**Total**	χ^2	**P-value**
	Low	**Moderate**	**High**			
Low knowledge (1 – 7)	78	48	10	136	4.758	0.114
Moderate knowledge (8 – 9)	80	54	9	143		
High knowledge. (10 – 12)	50	18	3	71		

From Table 15, the following observations were made: There was a positive correlation between the level of knowledge and consumption behavior of junk food, but it was not significant.

CHAPTER V

DISCUSSION AND CONCLUSION

The title of the study was knowledge and behavior of junk food consumption among students in Ji Lin province, China. This study aims to study the knowledge and behavior of junk food consumption of students in the third middle school and to explore the relevant factors of the junk food consumption behavior of the students in the third middle school. The study population consists of 1,560 students from the third experimental middle school in Si ping City, Jilin Province. individuals. The sample size was determined using Taro Yamane's formula, yielding a final sample of 350 individuals, selection was performed by a stratified sampling method. The study employed a structured questionnaire as the primary research instrument, comprising the following sections:

1. Conclusion
2. Discussion
3. Research limitations
4. Recommendation for using Research
5. Recommendation for Further Research

Conclusion

The purpose of this study is to study the cognition and consumption behavior of junior high school students in Jilin the third middle school on junk food. This study collected data from 350 students through stratified sampling, and analyzed the results by various statistical methods.

From objective 1: Regarding the knowledge level, most students have a moderate level of knowledge about junk food, among which 40.86% of students have a moderate level of knowledge about junk food, which indicates that students have a good understanding of junk food.

As for the consumption behavior of junk food, most students have a high level of behavior, and 43.43% of students have a high level of consumption behavior of junk food, indicating that students' consumption behavior of junk food is very serious.

From objective 2: relationship between Factors and consumption Behavior，Factors affecting the consumption behavior of junk food: This study identified several factors affecting the consumption behavior of junk food, including the age of respondents, monthly living expenses, BMI . For example, older people consume more junk food. The higher the BMI, the more junk food they consume.

Discussion

From objective 1:

Research findings indicate that students have a moderate level of knowledge about junk food. This is mainly due to: students 'perception of junk food being significantly related to their parents' attitudes and the family's dietary environment; more educated parents may provide children with more information and control their intake of junk food. This is also associated with monthly living expenses; children on a tight budget are controlled in their spending and cannot freely purchase the junk food they desire. As junk food consumption increases, so does the risk of overweight or obesity. The psychological state and self-perception of adolescents also influence their eating behavior, such as academic pressure,

conflicts with family members, and interpersonal relationships at school, all of which can affect how much junk food they consume. Different，(Shah et al,2022)The study was conducted in a private school in Nepal and investigated the knowledge and behavior of junk food among 60 adolescent students. The results showed that 36.7% of participants had poor knowledge, 31.7% moderate and 31.7% good, indicating low knowledge. Different, more than two-thirds of school students (69%) were dissatisfied with garbage knowledge, indicating a low level of knowledge.

Research findings indicate that students exhibit high levels of consumption of junk food. This is mainly due to: first, students frequently access junk food through school cafeterias, nearby convenience stores, and peer influence, making these foods easily accessible. Despite many students being aware of potential health risks, they continue to consume junk food because of its affordability, good taste, and convenience. Second, consumer behavior is significantly influenced by family dietary patterns and parenting styles. When parents provide healthier food options at home or limit pocket money, students tend to reduce their intake of junk food. However, when children have more freedom in food selection and consumption, their likelihood of buying junk food increases, leading to a rise in body mass index. Additionally, media exposure plays a dual role. On one hand, advertisements attract students with appealing promotions and images; on the other hand, the impact of health campaigns is limited unless reinforced through school education and parental guidance. Similarly, (Suraj Sujan Bohara et al,2021) consumption of junk food is very high amoe knowledge of the harmful consequences of junk food, school adolescents arng adolescents in both public and private school adolescents. Despite adequate consuming junk food because it is easily accessible and ready-to-use packaging. Different, (Gketsios et

al, 2022) most preadolescent children were classified as at least moderate junk food consumers, while nearly 3 / 10 children were classified as highly junk food consumers.

From objective 2:

Our study found that the consumption behavior of junk food is affected by age, and older middle school students tend to consume more junk food.This result is mainly attributed to: first, as they grow older, senior students have more freedom in managing their money and can choose foods they like, even though they know the dangers of junk food, they still opt for it. Different, (Shariff et al., 2021) found that with age, teenagers' consumption of junk food gradually decreases. A national school nutrition survey conducted in Malaysia showed that older adolescents eat less junk food in daily life, a trend possibly related to increased attention to health and body shape. Different, (Dunford et al., 2020), analyzing the dietary behaviors of American adolescents from 2003 to 2016, it was found that the intake of junk food decreased among older groups, reflecting an improvement in health knowledge with age.

Our research found that junk food consumption behavior is influenced by the monthly living expense, and students with high monthly living expense tend to eat more junk food. This result is mainly due to: first, The more living expenses a student has, the more likely they are to participate in social activities such as parties, outings, and ordering takeout, which often consist of high-calorie, high-sugar junk food. Secondly, Students generally have weaker self-control. With more living expenses, they may instead be more prone to indulging in high-calorie diets rather than using the extra money for healthy foods or proper dietary planning. Similarly, Huang et al,(2024 A population-based study in Hong Kong found that the amount of pocket money significantly influenced how often students bought junk food, with those who had more pocket money more likely to buy high-calorie snacks at convenience stores or fast-food restaurants outside school. Similarly, Upreti et al, (2022)

systematic review concluded that the availability of pocket money is an important individual-level factor driving adolescents to choose an unhealthy diet. Together, these studies support the idea that as students' economic ability improves, their junk food consumption behavior increases accordingly.

Our study found that junk food consumption behavior is influenced by BMI, with students with higher BMI often consuming more junk food. This result is mainly due to: first, students with higher BMI often have developed a preference for diets high in fat, sugar, and salty flavors, making them more likely to choose junk food over healthier options, even when they know it's unhealthy. Second, high BMI is usually associated with sedentary lifestyles and lack of exercise, which often goes hand in hand with frequent consumption of junk food, creating a vicious cycle. Moreover, studies have shown that adolescents with higher BMI are more prone to eating due to stress, anxiety, boredom, and other emotional factors. The satisfying nature of consuming junk food makes it an easier emotional substitute for them. Similarly, (Singh et al.2023) In a cross-sectional study of Tibetan adolescents in Himachal Pradesh, India, it was found that adolescents with higher BMI tended to choose high-calorie, low-nutrient density junk foods in their dietary behaviors. This study showed a positive relationship between junk food intake and the degree of obesity. Similarly, (Qureshi et al,2021). In the Pakistani study noted a statistically significant association between BMI and number of high salt food and soft drink intake in adolescents, especially in the female population. Together, these results support a trend that adolescents with higher BMI are more likely to form poor dietary patterns, with junk food intake being a key contributing factor.

In summary, this study comprehensively analyzed the knowledge level and consumption behavior of junior high school students regarding junk food. The research findings indicate that age, monthly living expenses, and BMI are key factors influencing their

knowledge and behavior. Students with higher BMIs not only have lower nutritional knowledge but also prefer junk food more, which may be related to their established dietary habits, emotional eating, and weak health knowledge. Therefore, it is necessary to implement targeted interventions, including strengthening nutrition education in schools, encouraging family participation, and behavioral guidance for health promotion, to help adolescents reduce their dependence on junk food and promote healthier lifestyles.

Research limitations

Despite the valuable insights provided by this study, several limitations should be acknowledged:

1. Sample area limitation This study was only conducted in Jilin Province, China. The sample area is limited and cannot fully represent the situation of junior high school students in different regions of the country. There may be differences in dietary behavior among urban and rural students, eastern and western students or students from other provinces, and the generalization of the results is limited.

2. Since Chen's questionnaire has subjective bias, data collection mainly relies on the questionnaire, which is filled out by students themselves. This may lead to social expectation bias or recall bias, especially when it comes to the number of junk food intake, students may underestimate the actual consumption.

3. The questionnaire did not cover psychological factors and cultural background. The questionnaire mainly focused on personal data, knowledge and behavior, but did not deeply explore the psychological state (such as emotional eating) or sociocultural influence

(such as family eating culture) that affected dietary choices, which may make the interpretation of results less comprehensive.

Recommendation for using Research

1. Strengthen Nutrition and Health Education for Adolescents

Although most students demonstrate a moderate level of knowledge about junk food, there remains a disconnect between knowledge and actual behavior. Schools should enhance ongoing education on the health risks of junk food and promote healthy dietary choices through curriculum integration, knowledge campaigns, and collaboration with parents.

2. Limit the Availability of Junk Food on and Around Campus

The easy accessibility of junk food in and around school areas—such as from convenience stores or food delivery platforms—contributes to high consumption rates. Schools should implement policies to restrict the sale of junk food and instead promote healthier alternatives, creating a supportive environment for good dietary habits.

3. Encourage Family Engagement to Promote Healthy Eating Habits

Families play a crucial role in shaping students' eating behaviors. It is recommended that schools involve parents in health education initiatives by providing informational materials, organizing workshops, and encouraging the provision of nutritious meals at home to support students in making healthier food choices.

4. Regulate Junk Food Advertising and Promote Healthy Messaging in Media

Advertising and social media significantly influence adolescents' junk food consumption. Government authorities should strengthen the regulation of junk food

marketing, especially those targeting minors. Simultaneously, healthy eating campaigns should be actively promoted through mainstream and digital media to shift youth preferences toward healthier options.

5. Develop Targeted Interventions for High-Risk Groups (e.g., High BMI, Congenital Diseases)

The study shows that students with higher BMI or congenital diseases are more likely to consume junk food frequently. Targeted interventions—such as personalized nutritional counseling, school-based health monitoring programs, and regular health check-ups—should be implemented to support these students in improving their eating behaviors and reducing health risks.

Recommendation for Further Research

1. To expand the sample coverage and enhance the representativeness of the results, follow-up studies can consider carrying out horizontal comparisons among different provinces, urban and rural areas, and school types, expanding the sample size and regional coverage, so as to improve the external validity and generalizability of the results, and more comprehensively reveal the overall picture of Chinese junior high school students' junk food behavior.

2. Integrating psychological and sociocultural variables to enrich the theoretical framework, subsequent studies can introduce psychological factors (such as stress, anxiety, emotional eating) and family sociocultural background (such as parents' dietary attitudes, peer influence), construct a more systematic behavioral model, and improve the explanatory power of the study.

3. Improve measurement tools and enhance the breadth and depth of knowledge assessment. It is suggested that in the future, multi-dimensional nutrition knowledge assessment tools should be adopted to add such contents as interpretation ability of nutrition labels and food safety knowledge, or improve the real measurement of students' nutrition situation through situational multiple-choice questions, interviews and other methods.

REFERENCE

Alekozay, M., Niazi, A., & Najm, A. F. (2023). Prevalence of emotional and behavioral problems among schoolchildren in Herat City, Afghanistan. *Global Health Journal*, *7*(1), 55–60. Retrieved from https://doi.org/10.1016/j.glohj.2023.02.005

Azemati, B., Kelishadi, R., Ahadi, Z., Shafiee, G., Taheri, M., Ziaodini, H., Qorbani, M., & Heshmat, R. (2018). Association between junk food consumption and cardiometabolic risk factors in a national sample of Iranian children and adolescents population: the CASPIAN-V study. *Eating and Weight Disorders - Studies on Anorexia Bulimia and Obesity*, *25*(2), 329–335. Retrieved from https://doi.org/10.1007/s40519-018-0591-1

Baker, P., Machado, P., Santos, T., Sievert, K., Backholer, K., Hadjikakou, M., Russell, C., Huse, O., Bell, C., Scrinis, G., Worsley, A., Friel, S., & Lawrence, M. (2020). Ultra-processed foods and the nutrition transition: Global, regional and national trends, food systems transformations and political economy drivers. *Obesity Reviews*, *21*(12). Retrieved from https://doi.org/10.1111/obr.13126

Chen, X., Zhang, Z., Yang, H., Qiu, P., Wang, H., Wang, F., Zhao, Q., Fang, J., & Nie, J. (2020). Consumption of ultra-processed foods and health outcomes: a systematic review of epidemiological studies. *Nutrition Journal*, *19*(1). Retrieved from https://doi.org/10.1186/s12937-020-00604-1

Cooper, F., And, L. D., & Rose, A. (2023). *COVID-19 and shame*. Retrieved from https://doi.org/10.5040/9781350283442

Corrigendum: Park C, Fang J, Hawkins NA, Wang G. Comorbidity status and annual total medical expenditures in U.S. hypertensive adults. Am J Prev Med. 2017;53(6S2):S172–S181. (2020). *American Journal of Preventive Medicine, 58*(6), 898. Retrieved from https://doi.org/10.1016/j.amepre.2020.04.004

ElBarazi, A., & Tikamdas, R. (2023). Association between university student junk food consumption and mental health. Nutrition and Health. Retrieved from https://doi.org/10.1177/02601060231151480

Endy, E. J., Yi, S., Steffen, B. T., Shikany, J. M., Jacobs, D. R., Goins, R. K., & Steffen, L. M. (2023). Added sugar intake is associated with weight gain and risk of developing obesity over 30 years: The CARDIA study. *Nutrition Metabolism and Cardiovascular Diseases, 34*(2), 466–474. Retrieved from https://doi.org/10.1016/j.numecd.2023.10.022

First WHO report details the devastating impact of hypertension and ways to stop it. (2023). *Egyptian Journal of Nursing and Health Sciences, 4*(3), 4–7. Retrieved from https://doi.org/10.21608/ejnhs.2023.318998

Forero, L. C., Gómez, L. F., Mora-Plazas, M., Parra-Murillo, M., Toquica, S., & Taillie, L. S. (2025). Changes in the nutrient composition of top-selling packaged foods and beverages in Colombia between 2016 to 2021. *Frontiers in Nutrition, 12.* Retrieved from https://doi.org/10.3389/fnut.2025.1534195

Fortune Business InsightsTM. (n.d.). *Fortune Business InsightsTM Global Market* Research Reports & Consulting. Retrieved from https://www.fortunebusinessinsights.com/

Fryar, C. D., Kit, B., Carroll, M. D., & Afful, J. (2024). Hypertension prevalence, awareness, treatment, and control among adults age 18 and older: United States, August 2021-August 2023. *PubMed, 511*. Retrieved from https://pubmed.ncbi.nlm.nih.gov/40085792

Giles, E. L., Stevens, H., McGeechan, G. J., Walker, L., Pakunwanich, N., Whittaker, V., & Smith, J. (2024). Evaluating the nutrition and body mass index clinical link pathway in mental health and learning disability services: A mixed-methods study. PLoS ONE, 19(6), e0303893. Retrieved from https://doi.org/10.1371/journal.pone.0303893

Gketsios, I., Tsiampalis, T., Foscolou, A., Vassilakou, T., Kanellopoulou, A., Notara, V., Antonogeorgos, G., Rojas-Gil, A., Kornilaki, E., Lagiou, A., Panagiotakos, D., & Kosti, R. (2022). The Association of Junk Food Consumption with Preadolescents' Environmental Influences: A School-Based Epidemiological Study in Greece. *Children*, *9*(12), 1891. Retrieved from https://doi.org/10.3390/children9121891

Grillo, A., Salvi, L., Coruzzi, P., Salvi, P., & Parati, G. (2019). *Sodium intake and hypertension. Nutrients*, *11*(9), 1970. https://doi.org/10.3390/nu11091970

He, M., Su, D., Zhang, R., Xu, P., Han, D., Huang, L., & Zou, Y. (2025). Sex Disparity in the Nutrition-Related Determinants of Mild Cognitive Impairment: A Case–Control Study. *Nutrients*, *17*(2), 248. Retrieved from https://doi.org/10.3390/nu17020248

Huang, J., Chan, S. C., Pang, W. S., Chow, S. H., Fung, Y. C., Keung, V. M. W., Cheung, C. K. M., Lo, A. S. C., Mui, L. W. H., Lee, A., & Wong, M. C. S. (2024). Factors associated with consuming unhealthy food in school children: A population-based study from Hong Kong. Health Science Reports, 7(3). Retrieved from https://doi.org/10.1002/hsr2.1964

huangS., Thapa, K., Bhatt, L. D., Dhami, S. S., & Wagle, S. (2021). Determinants of junk food consumption among adolescents in Pokhara Valley, Nepal. *Frontiers in Nutrition, 8.* Retrieved from https://doi.org/10.3389/fnut.2021.644650

Internet recruitment industry data analysis: The number of mobile recruitment users in China is expected to reach 238 million in 2020-IMedia Network-a global new economy industry data analysis report publishing platform. (n.d.). This page is copyrighted by IMedia Consulting Company.All Rights Reserved. Retrieved from https://www.iimedia.cn/c400/70164.html

Jiang, K., Zhang, L., Xie, C., Li, Z., Shi, Z., Sharma, M., & Zhao, Y. (2024). Understanding the Knowledge, Attitudes, and Practices of Healthy Eating among Adolescents in Chongqing, China: An Empirical Study Utilizing Structural Equation Modeling. *Nutrients*, *16*(1), 167. Retrieved from https://doi.org/10.3390/nu16010167

Kaur, H. (2019). Nutritional challenges and health consequences of junk foods. *Current Research in Diabetes & Obesity Journal*, *10*(5). Retrieved from https://doi.org/10.19080/crdoj.2019.10.555796

Kent, M. P., Bagnato, M., Amson, A., Remedios, L., Pritchard, M., Sabir, S., Gillis, G., Pauzé, E., Vanderlee, L., White, C., & Hammond, D. (2024). #junkfluenced: the marketing of unhealthy food and beverages by social media influencers popular with Canadian children on YouTube, Instagram and TikTok. *International Journal of Behavioral Nutrition and Physical Activity, 21*(1). Retrieved from https://doi.org/10.1186/s12966-024-01589-4

Li, Y., Lai, Y., Geng, T., Xia, P., Chen, J., Tu, Z., Yang, K., Liao, Y., Liu, G., & Pan, A. (2024). Association of Ultraprocessed Food Consumption with Risk of Cardiovascular Disease Among Individuals with Type 2 Diabetes: Findings from the UK Biobank. *Molecular Nutrition & Food Research, 68*(9). Retrieved from https://doi.org/10.1002/mnfr.202300314

Li, Z., Fang, Y., Zhang, N., Zhu, W., Chang, S., Zhou, S., Zhang, M., & Ma, G. (2024). Evaluating Childhood Overweight- and Obesity-Related food marketing policies in China using the Food–Environment Policy Index (Food–EPI). *Nutrients, 16*(4), 482. Retrieved from https://doi.org/10.3390/nu16040482

Liu, J., Lee, Y., Micha, R., Li, Y., & Mozaffarian, D. (2021). Trends in junk food consumption among US children and adults, 2001–2018. *American Journal of Clinical Nutrition, 114*(3), 1039–1048. Retrieved from https://doi.org/10.1093/ajcn/nqab129

Liu, Y., Cheng, J., Wan, L., & Chen, W. (2023). Associations between Total and Added Sugar Intake and Diabetes among Chinese Adults: *The Role of Body Mass Index. Nutrients, 15*(14), 3274. Retrieved from https://doi.org/10.3390/nu15143274

Lust, C. a. C., Bi, X., Henry, C. J., & L, D. W., MA. (2021). Development of Fatty Acid Reference Ranges and Relationship with Lipid Biomarkers in Middle-Aged Healthy Singaporean Men and Women. *Nutrients, 13*(2), 435. Retrieved from https://doi.org/10.3390/nu13020435

Man, C. S., Hock, L. K., Ying, C. Y., Cheong, K. C., Kuay, L. K., Huey, T. C., Baharudin, A., & Aziz, N. S. A. (2021). Is fast-food consumption a problem among adolescents in Malaysia? An analysis of the National School-Based Nutrition Survey, 2012. *Journal of Health Population and Nutrition, 40*(1). Retrieved from https://doi.org/10.1186/s41043-021-00254-x

Mauch, C. E., Wycherley, T. P., Bell, L. K., Laws, R. A., Byrne, R., & Golley, R. K. (2022). Parental work hours and household income as determinants of unhealthy food and beverage intake in young Australian children. *Public Health Nutrition, 25*(8), 2125–2136. Retrieved from https://doi.org/10.1017/s1368980022000349

Mirhadyan, L., Latreyi, S. M., Pasha, A., & Leili, E. K. N. (2020). Junk Food Consumption and its Associated Factors in High School Students in Rasht in 2017. *Journal of Research Development in Nursing and Midwifery, 17*(1), 52–66. Retrieved from https://doi.org/10.29252/jgbfnm.17.1.52

Mishra, S. (2023). Consumption of junk foods and risk of Type 2 diabetes: a review. *International Journal of Horticulture Agriculture and Food Science, 7*(2), 7–9. Retrieved from https://doi.org/10.22161/ijhaf.7.2.2

Ong, K. L., Stafford, L. K., McLaughlin, S. A., Boyko, E. J., Vollset, S. E., Smith, A. E., Dalton, B. E., Duprey, J., Cruz, J. A., Hagins, H., Lindstedt, P. A., Aali, A., Abate, Y. H., Abate, M. D., Abbasian, M., Abbasi-Kangevari, Z., Abbasi-Kangevari, M., ElHafeez, S. A., Abd-Rabu, R., . . . Azadnajafabad, S. (2023).

Global, regional, and national burden of diabetes from 1990 to 2021, with projections of prevalence to 2050: a systematic analysis for the Global Burden of Disease Study 2021. *The Lancet, 402*(10397), 203–234. Retrieved from https://doi.org/10.1016/s0140-6736(23)01301-6

Ounprasertsuk, J., & Damuso, S. (2025). Factors influencing food consumption behavior among Thai senior High School students: a Cross-Sectional study. *Journal of Nursing and Midwifery Sciences, 12*(1). Retrieved from https://doi.org/10.5812/jnms-158941

Pan, F., Wang, Z., Wang, H., Zhang, J., Su, C., Jia, X., Du, W., Jiang, H., Li, W., Wang, L., Hao, L., Zhang, B., & Ding, G. (2023). Association between Ultra-Processed Food Consumption and Metabolic Syndrome among Adults in China—Results from the China Health and Nutrition Survey. *Nutrients, 15*(3), 752. Retrieved from https://doi.org/10.3390/nu15030752

Pant, A., Gribbin, S., Machado, P., Hodge, A., Wasfy, J. H., Moran, L., Marschner, S., Chow, C. K., & Zaman, S. (2023). Ultra-processed foods and incident cardiovascular disease and hypertension in middle-aged women. *European Journal of Nutrition, 63*(3), 713–725. Retrieved from https://doi.org/10.1007/s00394-023-03297-4

Qiu, N., Moore, J. B., Wang, Y., Fu, J., Ding, K., & Li, R. (2021). Perceived Parental Attitudes Are Indirectly Associated with Consumption of Junk Foods and Sugar-Sweetened Beverages among Chinese Adolescents through Home Food Environment and Autonomous Motivation: A Path Analysis. *Nutrients, 13*(10), 3403. Retrieved from https://doi.org/10.3390/nu13103403

Ren, Y., Shi, X., Mu, J., Liu, S., Qian, X., Pei, W., Ni, S., Zhang, Z., Li, L., & Zhang, Z. (2024). Chronic exposure to parabens promotes non-alcoholic fatty liver disease in association with the changes of the gut microbiota and lipid metabolism. *Food & Function, 15*(3), 1562–1574. Retrieved from https://doi.org/10.1039/d3fo04347a

Richardson, S. S. (2023). The new science of menstruation. *The Lancet, 402*(10395), 16. Retrieved from https://doi.org/10.1016/s0140-6736(23)01317-x

Sahasakul, Y., Amonsusawat, N., & Phansuea, P. (2023). Lifestyles, Food Consumption Frequencies, and Eating Behaviors among Three Main Disciplines of Undergraduate Students during the Early COVID-19 Outbreak in Thailand. *Nutrients, 15*(12), 2765. Retrieved from https://doi.org/10.3390/nu15122765

Sauer, C. M., Reardon, T., Tschirley, D., Liverpool-Tasie, S., Awokuse, T., Alphonce, R., Ndyetabula, D., & Waized, B. (2021). Consumption of processed food & food away from home in big cities, small towns, and rural areas of Tanzania. *Agricultural Economics, 52*(5), 749–770. Retrieved from https://doi.org/10.1111/agec.12652

Shah, P., Sah, S., Kapar, V. K., & Giri, S. S. (2022). Knowledge and Behavior Related to Junk Food among Adolescent Students in a Private School: A Cross-sectional Study. MedS Alliance Journal of Medicine and Medical Sciences, 2(4), 59–65. Retrieved from https://doi.org/10.3126/mjmms.v2i4.53570

Shi, L., Li, Z., Ma, X., Wang, J., Wu, Y., Zhu, Y., Wang, Y., Yang, Y., Luo, M., Li, J., Sun, X., & He, S. (2025). Effects of ultra-processed foods on the liver: insights from gut microbiome and metabolomics studies in rats. *Frontiers in Nutrition, 11.* Retrieved from https://doi.org/10.3389/fnut.2024.1503879

Shim, J., Ha, K. H., Kim, D. J., & Kim, H. C. (2023). Ultra-Processed food consumption and obesity in Korean adults. *Diabetes & Metabolism Journal*, *47*(4), 547–558. Retrieved from https://doi.org/10.4093/dmj.2022.0026

Singh, N., Singh, S., & Kshatriya, G. K. (2023, January 25). Dynamics of junk food consumption with central and general obesity: A Cross-Sectional Study among adolescent Tibetan girls in India. Singh | Current Science. Retrieved from https://www.i-scholar.in/index.php/CURS/article/view/223115/206364

Siu, J. Y., Chan, K., & Lee, A. (2018). Adolescents from low-income families in Hong Kong and unhealthy eating behaviours: Implications for health and social care practitioners. *Health & Social Care in the Community*, *27*(2), 366–374. Retrieved from https://doi.org/10.1111/hsc.12654

Song, C. (2025, April 14). China's regional cuisines - Chinese food types North–South. China Highlights - Since 1998! Retrieved from https://www.chinahighlights.com/travelguide/chinese-food/regional-cuisines.htm

Statista. (2022, March 25). S*portswear brands perceived as the "coolest" in Italy 2020.* https://www.statista.com/statistics/1131195/china-number-of-food-delivery-users/

Statista. (n.d.). Statista - the statistics portal. Retrieved from https://www.statista.com/

Subedi, S., Nayaju, S., Subedi, S., Acharya, A., & Pandey, A. (2021). KNOWLEDGE AND PRACTICE ON JUNK FOOD CONSUMPTION AMONG HIGHER LEVEL STUDENTS AT SELECTED EDUCATIONAL INSTITUTIONS OF KATHMANDU, NEPAL. *International Journal of Research - GRANTHAALAYAH*, *8*(12), 306–314. Retrieved from https://doi.org/10.29121/granthaalayah.v8.i12.2020.2872

Tareq, A. M., Mahmud, M. H., Billah, M. M., Hasan, M. N., Jahan, S., Hossain, M. M., Chy, F. J., Uddin, M. G., Emran, T. B., & Sayeed, M. A. (2022). Fast-food and obesity: Status among the young adult population in Bangladesh. *PubMed, 2*(3), e86. Retrieved from https://doi.org/10.52225/narraj.v2i3.86

University of South Florida. (n.d.). *Digital food ordering drives increased indulgence and spending, USF study reveals*. Retrieved from https://www.usf.edu/news/2024/digital-food-ordering-drives-increased-indulgence-and-spending-usf-study-reveals.aspx

Upreti, Y. R., Acharya, D., Yogi, B. N., Devkota, B., & Bhandari, T. R. (2022). Multilevel factors appealing to junk food consumption among school children and adolescents: A systematic review. Journal of Health Promotion, 10(1), 13–26. Retrieved from https://doi.org/10.3126/jhp.v10i1.50981

Wang, M., Ma, H., Qin, C., Mandizadza, O. O., Ni, H., Shi, Y., & Ji, C. (2025). Burden of diet-related chronic diseases in Chinese and Japanese adults attributable to dietary risk factors from 1990 to 2021: a systematic analysis of the Global Burden of Disease Study 2021. *Frontiers in Nutrition, 11*. Retrieved from https://doi.org/10.3389/fnut.2024.1472451

Wang, Y., Yeh, T., Shih, M., Tu, Y., & Chien, K. (2020). Dietary sodium intake and Risk of Cardiovascular Disease: A Systematic Review and Dose-Response Meta-Analysis. *Nutrients, 12*(10), 2934. Retrieved from https://doi.org/10.3390/nu12102934

Weinstein, G., Kojis, D., Banerjee, A., Seshadri, S., Walker, M., & Beiser, A. S. (2025). Ultra-processed food consumption and risk of dementia and Alzheimer's disease: The Framingham Heart Study. *The Journal of Prevention of Alzheimer S Disease, 12*(2), 100042. Retrieved from https://doi.org/10.1016/j.tjpad.2024.100042

Xiang, H., Tao, X., Guan, X., Yin, T., Li, J., Dong, D., & Shang, D. (2022). Contemporary Chinese dietary pattern: Where are the hidden risks? *Frontiers in Nutrition, 9.* Retrieved from https://doi.org/10.3389/fnut.2022.997773

Yamane, T. (1967). *Statistics: An Introductory Analysis* (2nd ed.). New York: Harper and Row.

Yang, W., Yu, W., Li, X., Li, X., & Yu, S. (2020). Alpha-synuclein differentially reduces surface expression of N-methyl-d-aspartate receptors in the aging human brain. *Neurobiology of Aging*, *90*, 24–32. Retrieved from https://doi.org/10.1016/j.neurobiolaging.2020.02.015

Yang, Y., Gao, Y., Yi, X., Hu, Y., Zhao, L., Chen, L., Sui, W., Zhang, S., & Ma, S. (2024). The impact of ultra-processed foods and unprocessed or minimally processed foods on the quality of life among adolescents: a longitudinal study from China. *Frontiers in Nutrition*, *11.* Retrieved from https://doi.org/10.3389/fnut.2024.1489067

Zhang, T., Xu, X., Chang, Q., Lv, Y., Zhao, Y., Niu, K., Chen, L., & Xia, Y. (2023). Ultraprocessed food consumption, genetic predisposition, and the risk of gout: the UK Biobank study. Lara D. *Veeken*, *63*(1), 165–173. Retrieved from https://doi.org/10.1093/rheumatology/kead196

Zhen, S., Ma, Y., Zhao, Z., Yang, X., & Wen, D. (2018). Dietary pattern is associated with obesity in Chinese children and adolescents: data from China Health and Nutrition Survey (CHNS). *Nutrition Journal, 17*(1). Retrieved from https://doi.org/10.1186/s12937-018-0372-8

APPENDIX

Appendix A

Interview forms

Knowledge and behavior of junk food consumption among students in Ji Lin province， China

Consent day

Date.....Month.....Year.....

I am Mr./Mrs./Miss……..

address…….

Read the details from the information sheet for participants in the research project and I agree to voluntarily participate in the research project.

I have received a copy of the consent form that I signed and dated, along with an information sheet for research participants. This is before signing the consent form to conduct this research. I was explained by the researcher about the purpose of the research. The duration of the research, research methods, dangers or symptoms that may arise from the research. or from the medicine used Including the benefits that will arise from the research and guidelines for treatment by other methods in detail I have had enough time and opportunity to ask questions until I have a good understanding. The researcher answered various questions willingly and without concealment until I was satisfied.

I have the right to terminate my participation in the research project at any time. There is no need to inform the reason. and termination of participation in this research It will not affect treatment or other rights that I will continue to receive. The researcher guarantees that my personal information will be kept secret. and will be disclosed only with my consent. Other persons on behalf of the research sponsoring company Human Research Ethics Committee the Food and Drug Administration may be permitted to inspect and process my information. This must be done for the purpose of verifying the accuracy of the information only. By agreeing to participate in this study, I am giving consent to have my medical history reviewed.

I have read the above and have a complete understanding of it. Willing to participate in research willingly. Therefore, signed this consent document.

.....Sign the person giving consent.

(.....) Name of person giving consent

Date .....Month.....Year.....

I have explained the purpose of the research, the research methods, dangers or adverse reactions or risks that may arise from the research. or from the medicine used Including the benefits that will arise from thorough research. Let the participants in the research project named above know and have a good understanding. Ready to sign the consent document willingly

.....

Signed by the researcher

(.....)

Name of researcher in detail

Date .....Month……..Year…….

.....	.....
Witness signature	Witness signature
(.....)	(.....)
Name of witness in detail	Name of witness in detail
Date .....Month…..Year…….	Date .....Month……..Year…….

Appendix B

Validity and Reliability

The random questionnaire survey was conducted in Hainan Province

Measurement	(Cronbach's alpha coefficient)
Knowledge about junk food consumption	**0.812**
Junk food consumption behavior	**0.798**

Appendix C

Questionnaire

Dear students: according to their actual situation can answer anonymously, the answer is only for the use, thank you for your cooperation!

Part I Personal factors

Guidance: Please select carefully the answer for each question and choose the answer by marking (√) the response option that best represents.

1. Gender

☐1. male ☐2. female

2. Age (one year old

☐1. 13 years old ☐2. 14 years old

☐3. 15 years old ☐4. 16 years old

3. Monthly living expenses

☐1. <150 yuan ☐2. 150 yuan- -300 yuan

☐3. 300 yuan- -450 yuan ☐4. ＞450 yuan

4. eligion

☐1. Buddhism ☐2. Islam

☐3. Christianity ☐4. Other

5. stature

☐1. ＜155cm ☐2. 155cm—165cm

☐3. 165cm—175cm ☐4. ＞175cm

6. weight

☐1. ＜45kg ☐2. 45kg—55kg

☐3. 55kg—65kg ☐4. ＞65kg

7. BMI

☐1. ＜18.5 ☐2. 18.5—23.9

☐3. 24—28 ☐4. ＞28

8 . Congenital disease

☐1. Yes

☐2. No

Part II Knowledge about junk food consumption

Guidance: Please select carefully the answer for each question and choose the answer by marking (√) the response option that best represents.

1. What does fast food refer to?

☐1. Food that is quickly prepared

☐2. Food that is low in calories

☐3. Food that takes a long time to prepare

2. What is a typical characteristic of most fast food?

☐1. High in fat and sugar

☐2. High in protein and fiber

☐3. High in salt and calcium

3. What health effect can excessive fast-food consumption have?

☐1. Helps with weight loss

☐2. Increases the risk of heart disease

☐3. Increases energy and strength

4. Which type of fast food usually has the highest calorie content?

☐1. Hamburgers and French fries

☐2. Vegetable salad

☐3. Chicken soup

5. What is the reason why fast food is popular?

☐1. It is expensive

☐2. It is convenient and fast

☐3. It takes a long time to prepare

6. How should junk food consumption be limited?

☐1. Consumed at every meal

☐2. Consumed in small amounts and infrequently

☐3. Consumed regularly

7. What is the risk of consuming beverages that come with junk food?

☐1. Increases refreshment

☐2. Increases blood sugar levels

☐3. Helps with digestion

8. Which type of junk food has the highest trans-fat content?

☐1. Cake

☐2. Grilled chicken

☐3. Fresh fruit juice

9. What should be particularly considered when choosing junk food?

☐1. Calorie and fat content

☐2. Price

☐3. Taste

10. Which type of junk food often has a high sodium content?

☐1. Sandwiches

☐2. Vegetable salad

☐3. Pizza

11. Which type of junk food typically has a high protein content?

☐1. Hamburgers

☐2. Donuts

☐3. White bread

12. What can reducing fast food consumption help decrease the risk of?

☐1. Cardiovascular diseases

☐2. Muscle growth

☐3. Daytime fatigue

Part III Junk food consumption behavior

Guidance: Please select carefully the answer for each question and choose the answer by marking (√) the response option that best represents.

Always means practice every day 4 scores

Often means Practice 4-6 days per week. 3 scores

ID	Junk food consumption behavior	Always (4)	Often (3)	Sometimes (2)	Never (1)
1	You eat sweets such as ice cream, cookies, and cake every day.				
2	You eat snacks every day.				
3	You regularly eat fast food such as pizza, hamburgers, and sandwiches.				
4	You order fast food for delivery to your residence.				
5	You eat fried or very greasy food.				
6	You like eating fast food such as fried chicken and French fries.				
7	You often celebrate occasions with friends and family at fast food restaurants.				

ID	Junk food consumption behavior	Always (4)	Often (3)	Sometimes (2)	Never (1)
8	You use fast food services in shopping malls.				
9	When you need something quick, you choose ready-made food.				
10	You like drinking canned vegetables and fruit juices.				
11	You enjoy eating Western-style food.				
12	You drink soft drinks with fast food.				
13	You drink sugary drinks instead of water.				
14	You consume fast food as a main meal.				
15	You only eat at the school cafeteria.				
16	You choose fast food primarily based on price.				

ID	Junk food consumption behavior	Always (4)	Often (3)	Sometimes (2)	Never (1)
17	You choose fast food primarily based on nutritional value.				
18	You choose fast food based on the restaurant's promotions.				
19	You choose fast food based on new advertisements or online reviews.				
20	You order multiple fast food items per meal.				

BIOGRAPHY

Name - Surname Ms. Wang xintong

Date of birth 17 July 2002

Current address

Chiang Rai Mueang Chiang RaiBan Du Chayani Courd8G Moe, 5 Bande District Mueong, Chiang Rai Thailand57100 57100 57100

Educational record

Primary school: Si Ping City first experimental primary school

Junior high school: Si Ping third experimental middle school

Senior high school: Si Ping City fourth senior high school

University: Hainan Vocational University of Science and Technology

studying

Bachelor's degree

Name the institution from which you graduated

Hainan Vocational University of Science and Technology

Work experience

25 August 2023 Hainan Vocational University of Science and Technology

Specify district, province Haikou City, Hainan Province

date Specify the location of the workplace.

25// August 2023，Hainan University of Science and Technology (Yunlong Campus), mid 118, Yun ding Road, Yunlong Town, Qiong shan District, Haikou City, Hainan Province Specify district, province Haikou City, Hainan Province