

THESIS

**THE OVERVIEW OF FOOD CHOICE MOTIVES AND
NUTRITIONAL STATUS OF ADOLESCENT IN
SENIOR HIGH SCHOOL 16 MAKASSAR**

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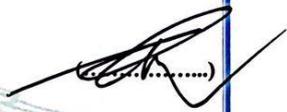
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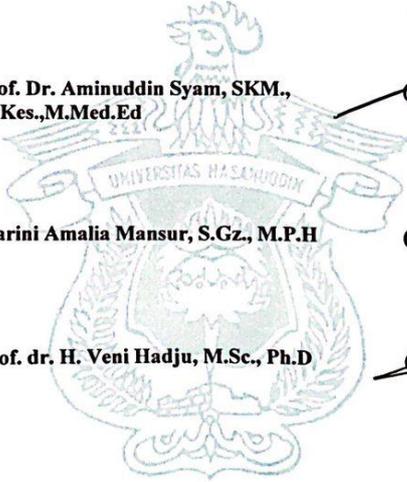

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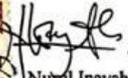
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Nurul Inayah



SUMMARY

HASANUDDIN UNIVERSITY
FACULTY OF PUBLIC HEALTH
NUTRITION STUDY PROGRAM

NURUL INAYAH

**“THE OVERVIEW OF FOOD CHOICE MOTIVES AND NUTRITIONAL STATUS OF ADOLESCENT IN SENIOR HIGH SCHOOL 16 MAKASSAR”
(xiii + 82 pages + 18 tables + 7 appendixes)**

In recent years, the development of the food and beverage industry has increased rapidly. The rapid development of the culinary industry, causes people's food choice motives to evolve. Meanwhile, in adolescence, adequate nutritional intake is needed for the growth process and food choice has big impact to nutritional intake. This study aims to describe the overview of food choice motives and nutrition status of adolescents.

This research was conducted in Senior High School 16 Makassar where it is located in the center of Makassar city and surrounded by many food and beverage industries in the vicinity. The research is carried by using qualitative descriptive method with proportionate stratified random sampling that leads to involving 164 students to be the part of this study. Adolescents' food choice motives were measured by using Food Choice Questionnaire (FCQ) and nutritional status data were obtained by using anthropometric measurements. The respondent characteristic and nutritional status are analyzed using SPSS, while the result of FCQ are analyzed by using Microsoft Excel.

The results of the 164 students, the primary food choice motives in order is Health (\bar{x} ; 3.231), followed by Price (\bar{x} ; 3.182), Sensory Appeal (\bar{x} ; 3.170), and Convenience' (\bar{x} ; 3.076). The primary motives according to grade shows that 10th grade student tend to choose Health, while 11th Grade student prefer Price. Continue to food choice according to gender, Female tend to choose Health, while Male choose Price. On the other hand, food choice according to pocket money show that the student with category IDR 5,000-15,000 chose Price, category IDR 15,000-30,000 chose Health, and category IDR 30,000-100,000 choose Sensory Appeal. According to the parent's employment, the student who have both of their parents working tend to choose Sensory Appeal, while the student who only have one parent working choose Health. Lastly, the food choice according to the mother education shows that all category has a tendency to choose Health in primary motives. to choose health. In addition, it is discovered that 12 students are identified as thinness (7.3%), and 41 students are identified overweight and obese (25%). Furthermore, the adolescent nutritional status shows slightly different tendencies when viewed from the grade, gender, pocket money, parent's occupation, and mother's education level. Therefore, it is suggested to the school stakeholder to encourage the provision and improvement of healthy canteens in the school area to support the student's nutrition status and dietary behavior, especially the food choice motives of the student.

Keywords: Food Choice, Adolescents, Nutrition Status

Reference: 73 (1989-2023)

FOREWORDS

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CHAPTER I

INTRODUCTION

A. BACKGROUND

In recent years, the development of the food and beverage industry has increased very rapidly. According to the Central Statistics Agency (BPS; Badan Pusat Statistik), the food and beverage industry's GDP at constant prices reached IDR 200.26 trillion in the second quarter of 2022. This amount increased by 3.68% from IDR 193.16 trillion in the same period in 2021. As a result, the food and beverage industry is one of the sectors that has strengthened and recovered from the impact of the Covid-19 pandemic.

This rapid development is influenced by the position of the food and beverage sector, which is indeed the daily needs of the community. Aside from that, the food and beverage industry has evolved to become more than just a consumer product, but also a part of people's lifestyles. This can be seen in the many culinary businesses currently developing with creativity and high innovation in order to gain consumers (Wardoyo, 2016; Janeta & Santoso, 2018).

Technological developments are also one of the factors that help accelerate the growth of the culinary industry. Based on the report by We Are Social, a global creative agency reported the number of internet users in Indonesia reached 212.9 million in January 2023. This means that approximately 77% of Indonesia's population has access to the Internet. This number increased by 3.85% compared to the previous year. In January 2022, there were 205 million internet users in Indonesia. This shows the development trend of internet users in Indonesia continues to grow every year.

The presence of the Internet provides access to buying food and drinks online through online food ordering service platforms. The presence of technology provides good efficiency in the culinary aspect, whereby both the society and sellers can carry out the buying and selling process without having to leave the house. Furthermore, opportunities for culinary business owners to

carry out digital promotions are growing, which can be done not only through a food ordering application but also through social media, making it easier to introduce their business.

In addition, the development of technology has had an impact on changes in people's lifestyles toward a cashless society. People are now greatly facilitated by the existence of non-cash payment transactions, which are considered more practical and efficient than traditional or cash payment transactions. According to the study (Achir & Kusumaningrum, 2021), that is conducted in Surabaya figure out that among 152 students of Surabaya State University, the existence of e-money shows a positive and significant impact on their level of expenses.

The rapid development of the culinary industry, accompanied by numerous benefits ranging from taste, packaging, brand image, accessibility, price range, and others, causes people's food choice motives to evolve. Food choice refers to how a person decides what to buy and or eat. Based on research conducted by Chen, P. J., & Antonelli, M. (2020), Food characteristics, individual characteristics, and the environment are the three main motives that influence food selection. Food characteristic motives divide into intrinsic characteristics, including color, aroma, texture, and extrinsic characteristics, including information and packaging. Individual characteristic motives refer to biological conditions (hunger, appetite, and taste), physical conditions (accessibility, cooking skills, and time owned), psychosocial conditions (mood and stress), cognitive conditions (attitudes or preferences, health, beliefs, knowledge), and social conditions (family and peers). The environment, as the third motives, refers to culture, financial or economic conditions, and applicable policies.

It is found out that food choice is important determinant to prevent and intervene the obesity in adolescents. In 2018, Indonesia national health survey revealed 19.8% of adolescents were overweight and obesity, a ten-fold increase in the past decade. Whereas the COVID-19 pandemic is expected to amplify this trend due to many life restriction (Agung, et al, 2022). Therefore, the

prevention of obesity is highly needed and will be an effective strategy than the treatment in developing countries (Ford, Patel, & Narayan, 2017). Adolescents are the target of obesity prevention program. Adolescent suffering from obesity have a high risk of becoming an adult who also suffers from obesity and causes various health problems (Pandita et al., 2016). Losing weight in adults who suffer from obesity is more difficult. The limitation of losing weight in obesity relates to the high mortality rate. Food choice can be used as one-way intervention confronts obesity in adolescents.

According to WHO, adolescence is a transitional phase between children and adults with an age range of 10-19 years. During this period, an individual experiences rapid physical, cognitive and psychosocial development. In adolescence, adequate nutritional intake is needed for the growth process. One of the things that affect nutritional intake is the pattern of food choice. If an error occurs in the food choice motives, it will have a negative impact on the body and health (Shannon et al, 2002, in Wahyuningtyas et al, 2020). However, adolescence, which is a phase of socialization, makes peers have the power to influence mindsets or desires, including making food choices so that their presence can be accepted or even become part of their social environment (Salvy, 2011). This is what makes adolescents begin to actively convey their freedom and rights to express their own opinions to their parents, including lifestyle choices or food choices.

Based on research conducted to the adolescent in Yogyakarta (Wahyuningtyas, et al, 2020) shows that participants place health as the most dominant motive in the food choice process, followed by food composition, price, and ethics. This study uses family income as one of the independent variables with participants dominated by families who have income below the Regional/Provincial Minimum Wage of the UMR. In line with research conducted in Yogyakarta, research conducted in Jakarta (Maulida, et al, 2016) shows that health is also the main motive in food choice, but the next motive is influenced by the condition of family prosperity. In disadvantaged families,

convenience and price are the second motives in making food choices, whereas affluent families do not pay attention to these motives.

Additionally, the research conducted in Surabaya (Radjah et al (2022) on the relationship between stress events and food choice motives for first-year students at Airlangga University shows that health is also a major motive in the food selection process, which is followed by mood motives and comfort motives. Along with the studies conducted in Indonesia, the study conducted in New Zealand among 144 female high school students aged 15 to 18 years old found out that health is the first rank motive on food choice. The food choice motive then followed by price as the second rank and sensory appeal as the third rank. This shows that in certain conditions, adolescents generally place health as the main motive in food choice, although the following motives are more varied, depending on the conditions that are being experienced either intrinsically or extrinsically by adolescents.

While the study conducted by Piccolo et al (2019) found that there is evidence for the importance of considering food choice patterns when assessing dietary intake and highlights the potential impact of food choice on overall meal composition. The findings suggest that promoting healthier food choices could have a significant impact on improving overall diet quality and reducing the risk of chronic disease.

In addition, there have been several studies proving the correlation between food patterns and nutritional status. In 2017, research conducted by Bhattacharjee, et al that involving 304 participants in the North-East region of India found that participants who followed a "traditional" dietary pattern, characterized by a high intake of rice, vegetables, and fish, had higher levels of serum folate, vitamin B12, and iron than those who followed a "westernized" dietary pattern, characterized by high intake of refined grains, meat, and processed foods. This finding shows there are significant impact between individual food patterns and the improvement of nutritional status and reducing the risk of nutrient deficiencies.

Based on the description demonstrates that food choice and nutritional status have indirect relation that can impact the individual state. By several researches conducted, it is found out that health is the most influential motive in food choice of adolescence, followed by a number of other motives. A similar study, however, has not been conducted in Makassar. Furthermore, previous studies did not describe nutritional status. Therefore, the researcher was intrigued by the overview of food choice motives and the nutritional status of adolescents in Senior High School 16 Makassar.

B. RESEARCH QUESTION

Based on the description, the formulation of the problem that the author in this study will study are:

1. What is the overview of food choice factors among the adolescents in Senior High School 16 Makassar?
2. What is the overview of nutritional status among the adolescents in Senior High School 16 Makassar?

C. RESEARCH OBJECTIVE

Based on the description of the problem formulation above, the objectives of this study are:

1. To identify the overview of food choice factors among the adolescents in Senior High School 16 Makassar.
2. To identify the overview of nutritional status among the adolescents in Senior High School 16 Makassar.

D. RESEARCH ADVANTAGE

Based on the description of the problem formulation above, the advantages that are hoped by this study are:

1. Institution

It is hoped that this will become the latest information and reference material that can be used by other researchers when continued.

2. Scholastic

It is hoped that this will become the latest information for policymakers in making future programs, especially about the intervention program in adolescent nutritional intake.

3. Practitioner

It is hoped that this will become a new experience and knowledge in increase insight and knowledge about the description of food selection factors and nutritional status in adolescents.

CHAPTER II

LITERATURE RIVIEW

A. ADOLESCENTS

1. Definition of Adolescence

Adolescence is defined as a developmental period straddling the transition from childhood to adulthood, from ages 10 to 19. It is a unique stage of human development and an important time for laying the foundations of good health. The adolescence phase is characterized by the changes that occur in the biological, cognitive, psychological, and social domains. (Steinberg, 2014). This affects how they feel, think, make decisions, and interact with the world around them. Throughout this phase, it is usually accompanied by changes in the social and educational environment, such as spending less time with parents and more time with peers. These behavioral changes occur as part of the developmental process, which is influenced by both external environmental factors and internal factors that elicit and reinforce behavior (Jaworska & MacQueen, 2015).

Adolescence is also known as a time of self-discovery. The attempts to discover identity take many forms, including trial and error, imitation, and identification behavior. Adolescents who are unable to determine their own identity will experience an identity crisis, resulting in the formation of a personality system that does not accurately reflect their current state. The personal and social lives of adolescents can be impacted by emotional reactions and expressions that are still unstable and uncontrolled. Adolescent emotional instability frequently leads to arguments and fights (Karneli, 2018).

2. Adolescence Characteristic

a. Physical Development

The biological changes that take place throughout the transition from childhood to adulthood are referred to as adolescent physical

development. These changes include changes in height, weight, body composition, and sexual development. The onset of puberty, which is marked by the development of secondary sexual characteristics, is the most notable feature of adolescent physical development.

1) Puberty

The onset of puberty is marked by the release of hormones, mainly estrogen in girls and testosterone in boys. These hormones cause the development of secondary sexual characteristics such as the growth of pubic and underarm hair, the development of breasts in girls, and the growth of testicles and penis in boys. The timing of puberty varies widely among individuals, but in general, it begins around age 8-14 in girls and 9-14 in boys.

2) Growth Spurt

The height and weight of a person rapidly grow during puberty. This typically happens between the ages of 10 and 14 in girls, and between the ages of 12 and 16 in boys. Boys continue to develop until they are about 18 years old, while girls often achieve their maximum height at around age 16.

3) Body Composition

Significant changes to body composition occur during puberty. Body fat accumulates in girls, especially in the breasts, hips, and thighs. Increased muscle mass and decreased body fat are observed in boys. Both sexes experience changes in body shape, with boys becoming more broad-shouldered and girls developing wider hips.

4) Sexual Development

The development of the reproductive system is a hallmark of sexual development, which happens during adolescence. In girls, menstruation starts as the uterus, ovaries, and fallopian tubes grow. Boys' testicles and penis develop, and sperm production starts.

5) Brain Development

The adolescent brain undergoes significant changes during this time as well. There is a rapid increase in the connections between brain cells, which can lead to changes in behavior and emotional regulation. This may also explain why teenagers tend to be more impulsive and prone to risk-taking behavior.

In conclusion, adolescent physical development is a complex process that involves changes in multiple systems, including the reproductive system, brain, and body composition. Understanding these changes can help parents, caregivers, and healthcare providers support adolescents through this important stage of development.

b. Emotional Development

Adolescence is a stage of life that begins with the onset of physical puberty and ends with the assumption of adult responsibilities. The book written by Rousseau, Émile, in the 18th century marked a turning point and had a significant influence on representations of adolescence, crystallizing the idea that this developmental period was a turbulent time. Stanley G. Hall (1904), often regarded as the father of adolescent psychology, coined the phrase "Storm and Stress" to refer to the mood disruptions, risk behaviors, and conflicts with parents associated with the adolescent years (Zimmermann et al, 2022)

Emotions are multifaceted phenomena that involve changes in subjective experience, behavior, and physiology (Gross, 2014). A core mental representation of emotion includes a sense of pleasure for positive emotions and displeasure for negative emotions (Barrett, Mesquita, Ochsner, & Gross, 2007; McLaughlin, K. A., Garrad, M. C., & Somerville, L. H., 2022).). Negative and positive emotions are distinct constructs that can be further subdivided into more complex emotional representations such as sadness, anger, calm, and joy. These complex emotions can vary in numerous aspects, including arousal, as well as relational and situational content (e.g., Barrett et al., 2007; McLaughlin, K. A., Garrad, M. C., & Somerville, L. H., 2022).

Four commonly assessed dimensions of emotional experience in adolescents include frequency, intensity, instability, and clarity of emotions. Emotional frequency refers to how many times an individual experiences a particular emotion over a given period of time (Larson, Csikszentmihalyi, & Graef, 1980). In the adolescent literature, frequencies are sometimes calculated for emotions at certain intensities such as frequencies of high-intensity vs. low-intensity negative emotions. Emotional intensity refers to the strength or magnitude of emotional response (Larsen & Diener, 1987). Emotional instability is the degree to which emotions fluctuate over time (e.g., Larsen & Diener, 1987). Finally, emotional clarity involves the extent to which people can unambiguously identify, label, and characterize their own emotions (e.g., Gohm & Clore, 2000).

Puberty is associated with significant hormonal changes that lead to physical maturation and influence a wide range of behaviors, including aggression and sexuality. Formal operational thought begins to replace concrete operations in early adolescence, allowing for more complex thoughts, information processing, and reasoning (Rosenblum & Lewis, 2003).

The social lives experienced by adolescent is part of the developmental changes. Early adolescence typically coincides with a transition to a new, often larger, school environment with higher expectations and less individual support (Simmons, Burgeson, Carlton-Ford, & Blyth, 1987). Moreover, adolescence is a time of increased independence during which adolescents begin to interact less with their parents and more with peers (Csikszentmihalyi & Larson, 1984; Schneiders et al., 2007). Amid these other changes, adolescents experience an increase in negative life events, have more family conflict, and often initiate romantic relationships.

Although most adolescents navigate these challenges successfully (Arnett, 1999), Adolescence has been considered, almost by definition,

a period of heightened stress (Spear, 2000) due to the many changes experienced concomitantly, including physical maturation, drive for independence, increased salience of social and peer interactions, and brain development.

c. Social Development

Adolescent social development refers to the changes and growth that occur in the way individuals interact with their peers and the wider society during adolescence, which typically begins around the age of 11 or 12 and ends in late teens. This is a critical period in which individuals undergo a range of social, emotional, and cognitive changes that shape their identities and affect their behavior and relationships throughout their lives.

1) Identity Development

During adolescence, individuals begin to form a sense of their own identity, which involves understanding who they are, what they believe, and what they want to do with their lives. Erik Erikson's theory of psychosocial development proposes that adolescence is a time when individuals must resolve the conflict of identity versus role confusion. This involves exploring different roles and identities and deciding which ones are most meaningful and authentic. This process of identity development is influenced by factors such as family, peers, culture, and personal experiences.

2) Peer Relationship

Adolescents spend a great deal of time with their peers, and these relationships play a crucial role in their social development. Peer relationships can provide emotional support, a sense of belonging, and opportunities for social learning and experimentation. They can also be a source of stress and conflict, particularly when peer pressure is involved. The study of adolescent peer relationships has been informed by social learning

theory, which emphasizes the role of reinforcement, modeling, and observational learning in shaping behavior.

3) Romantic Relationship

Adolescents spend a great deal of time with their peers, and these relationships play a crucial role in their social development. Peer relationships can provide emotional support, a sense of belonging, and opportunities for social learning and experimentation. They can also be a source of stress and conflict, particularly when peer pressure is involved. The study of adolescent peer relationships has been informed by social learning theory, which emphasizes the role of reinforcement, modeling, and observational learning in shaping behavior.

4) Family Relationship

Adolescents often experience increased conflict with their parents and siblings as they assert their independence and form their own identities. However, family relationships remain important sources of emotional support and socialization during this period.

5) Social Roles

Adolescents are also beginning to take on more adult roles in society, such as employment and civic engagement. These experiences can help shape their sense of self and their place in society.

Adolescent social development is influenced by a variety of factors, including culture, family, and individual characteristics. For example, cultural norms and values can influence the types of relationships and behaviors that are considered appropriate for adolescents. Adolescent social development can also be influenced by aspects of the family, such as parental style and family structure. Last but not least, personal traits like temperament and personality can affect how an adolescent interacts with others and forges social bonds.

In conclusion, adolescent social development is a complex and multifaceted process that involves changes in independence, identity, peer relationships, romantic relationships, and social roles. It is influenced by a variety of factors and is an important period of growth and development that sets the stage for adulthood.

B. FOOD CHOICE

1. Definition of Food Choice

Table 2. 1 Definition of Food Choice

No.	Definition of Food Choice	Source
1	Food choice is about why people eat the foods they do, and decisions about food are the outcome of processes that are complex, and influenced by biological, psychological, economic, social, cultural, physical, and political factors. Food choice behaviors are connected to the social and economic expression of identities, preferences, and cultural meanings and are an important determinant of nutritional status and health.	Monterrosa, E. C., Frongillo, E. A., Drewnowski, A., de Pee, S., & Vandevijvere, S. (2020). Sociocultural influences on food choices and implications for sustainable healthy diets. <i>Food and Nutrition Bulletin</i> , 41(2_suppl), 59S-73S. https://doi.org/10.1177/0379572120975874
2	Food choice is a complex activity with many dimensions that are multifaceted, contextual, dynamic, multilevel, integrated, and diverse.	Sobal, J., Bisogni, C. A., & Jastran, M. (2014). Food Choice Is Multifaceted, Contextual, Dynamic, Multilevel, Integrated, and Diverse. <i>Mind, Brain, and Education</i> , 8(1), 6–12. doi:10.1111/mbe.12044
3	Food choice is a term that offers a contemporary middle ground and permits many perspectives about how people think, feel, and act related to food.	Cornell Food Choice Research Group. (2013). Food choice research group webpage. Cornell University, Division of Nutritional Sciences, Ithaca, NY. Retrieved from www.human.cornell.edu/dns/foodchoice/
4	Food choice is the selection of foods for consumption, which results from the competing, reinforcing, and interacting influences of a variety of factors.	Buttriss, J., Stanner, S., McKeivith, B., Nugent, A. P., Kelly, C., Phillips, F., & Theobald, H. E. (2004). Successful ways to modify food choice: lessons from the literature. <i>Nutrition Bulletin</i> , 29(4), 333–343. doi:10.1111/j.1467-3010.2004.00462.x

5	Food choice is a decision process of an individual selecting food that is involving multiple behaviors including acquiring, preparing, storing, giving away, serving, eating, and cleaning up. These complex decisions involve many considerations about what to eat and when, where, and with whom to engage in food behavior.	Sobal, J., & Bisogni, C. A. (2009). Constructing food choice decisions. <i>Annals of behavioral medicine</i> , 38(suppl_1), s37-s46. https://doi.org/10.1007/s12160-009-9124-5
6	Food choice is defined as a process by which people select, acquire, prepare and consume foods, which results from the competing, reinforcing and interacting influences of a variety of factors	Shepherd, R., & Raats, M. (Eds.). (2006). <i>The psychology of food choice</i> (Vol. 3).
7	Food choice is a complex human behavior and consequently is influenced by many interrelating factors ranging from biological mechanisms and genetic profiles to social and cultural factors. Food choice refers to what foods are offered and what food is chosen.	Waddingham, S., Shaw, K., Van Dam, P., & Bettiol, S. (2018). What motivates their food choice? Children are key informants. <i>Appetite</i> , 120, 514–522. doi:10.1016/j.appet.2017.09.029
8	Food choice is built by involving three components: life course, influences, and personal system.	Furst, T., Connors, M., Bisogni, C. A., Sobal, J., & Falk, L. W. (1996). Food choice: a conceptual model of the process. <i>Appetite</i> , 26(3), 247-266.
9	Food choice is the process by which an individual selects, prepares, and eats food, which is influenced by a complex interplay of biological, psychological, social, and environmental factors.	Lowe, M. R., & Butryn, M. L. (2007). Hedonic hunger: A new dimension of appetite? <i>Physiology & Behavior</i> , 91(4), 432–439. doi:10.1016/j.physbeh.2007.04.006
10	Food choice refers to the selection of food items based on individual preferences, habits, and beliefs, as well as the availability and accessibility of food.	Godinho, C. A., Alvarez, M.-J., & Lima, M. L. (2016). Emphasizing the losses or the gains: Comparing situational and individual moderators of framed messages to promote fruit and vegetable intake.

		<p>Appetite, 96, 416–425. doi:10.1016/j.appet.2015.10.001</p>
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2. Factor Influencing Food Choice

Food choice, like any complex human behavior, is influenced by a number of interconnected factors. There are three main factors of food choice specifically food characteristics, individual characteristics, and environmental factors.

a. Food Characteristic

Food Characteristic Factors are the characteristics attached to the food. Food characteristic factors refer to the characteristics or attributes of foods that individuals consider when making decisions about what to eat. These factors can vary based on personal preferences, cultural background, and dietary needs. Here are some common food characteristic factors that influence food choice:

1) Taste and Flavor

The taste and flavor of food are one of the most important factors that influence food choice. People tend to choose foods that taste good and are enjoyable to eat. Depending on their personal taste preferences, people might favor sweet or savory cuisine, for instance.

However, these sensory attributes do not, of themselves, determine whether a person will choose a food rather the person's liking for an attribute in a particular food will be the determining factor. Liking for sensory attributes is generally food specific and probably these preferences are learned through experience (Cowart and Beauchamp, 1986).

There are some common findings such as sweet foods being highly liked and bitter foods being unpalatable and there may be innate mechanisms for these preferences. However, there are many

exceptions: for example, a degree of bitterness in coffee or chocolate is highly preferred. Within a particular culture, there is a large degree of agreement on the appropriateness of particular sensory attributes for particular foods, but there are also very substantial differences between individuals in their preferences, which will in part lead to different food choices and diets. Understanding these individual differences in preferences and food choice is of major concern in determining the factors influencing patterns of food selection.

2) Texture

Another crucial element that affects food choice is texture. Some people favor foods that have a crunchy feel, while others favor soft, smooth foods. People could favor eating crispy fried chicken over boiling chicken, for instance.

3) Appearance

Food appearance also affects what people decide to eat. Individuals could select items that appear tasty and enticing. A colorful salad made with fresh veggies, for instance, might be more enticing than a simple salad made with just one or two items.

4) Nutrition Value

Nutrition value also plays an important role, especially for an individual who is put concerned about their health and well-being. People may choose foods that are high in nutrients, rather than foods that are high in calories and low in nutrients.

b. Individual Characteristic

Individual characteristics play an important role in shaping food choices and dietary patterns, as well as their impact on health outcomes, according to recent research. A study published conducted by Valenza et al (2021) looked at the role of individual characteristics in predicting adherence to the Mediterranean diet and discovered that personality traits like openness to experience and conscientiousness were associated with higher adherence. Another research by Kim et al (2020) looked at

the impact of individual characteristics on food waste behavior and discovered that factors like age, income, and environmental attitudes were significant predictors of food waste.

Individual characteristics for food choice refer to the distinctive biological, psychological, and sociocultural qualities that affect a person's tastes and eating habits. These characteristics may include personality traits, emotional state, age, gender, cultural background, socioeconomic situation, and genetic predispositions.

1) Age

Age has a big impact on what foods people choose to eat. People's taste preferences, dietary needs, and health concerns vary as they become older. For instance, elderly persons may have diminished appetites, which may influence their dietary preferences. On the other side, younger adults could be more willing to explore new dishes and dabble in foreign cuisines.

2) Gender

Another element that may affect food choice is gender. Men and women have varied nutritional patterns and food choices, according to research. Women are more likely than males to consume whole grains, fruits, and vegetables, whereas men are more likely to consume meat and alcohol.

3) Culture and Belief

The importance of culture and belief in determining food choice is significant. Food tastes, cooking techniques, and eating customs vary among nations. For instance, while meat intake is more frequent in some cultures than others, vegetarianism is a common dietary pattern in others.

4) Socioeconomic Status

An additional significant variable that may affect food choice is socioeconomic status. While those with a lower socioeconomic class may rely more on fast food and processed

meals, those with better socioeconomic status are more likely to consume healthier foods.

5) Health Issue

A significant issue that may affect dietary preferences is the health state. Certain medical illnesses, like diabetes or high blood pressure, may require their sufferers to adhere to a particular eating plan in order to manage them. Likewise, people may decide to eat healthier foods if they want to lose weight or get healthier in general.

c. Environmental Factors

Environmental factors play a crucial role in determining food choices. Environmental factors refer to the external factors that influence food choices, such as availability, accessibility, and affordability of food. Here are some common environmental factors that influence food choice:

1) Food Availability

Food choice is influenced by food availability. Consumers frequently choose items that are easily found in their neighborhood markets and grocery stores. For instance, residents of coastal locations might eat more seafood than residents of landlocked places.

Similar findings have been made about how the built environment, such as the availability of supermarkets, grocers, and farmers' markets, affects dietary decisions. According to studies, people who are living in locations with a higher density of supermarkets and grocery shops are more likely to eat healthy foods, such as fruits and vegetables, than people who reside in areas with fewer outlets (Moore, 2008).

2) Food Accessibility

Food choice is also influenced by how easily accessible certain foods are. People tend to choose foods that are easy to access

and prepare. Those who live in places with limited access to fresh food could consume more canned or frozen food.

3) Affordability

Food choice is also influenced by how easily accessible certain foods are. People tend to choose foods that are easy to access and prepare. Those who live in places with limited access to fresh food could consume more canned or frozen food.

4) Marketing and Advertising

Advertising and marketing have an impact on what people choose to eat. Companies frequently are using persuasive advertising strategies to market their goods and sway consumers' food choices. In addition, marketing and advertising also include food labeling and packaging. Food labeling and packaging have also been identified as critical factors influencing food choices, as they provide information about the nutritional content and ingredients of foods (Boyland, et al, 2016).

5) Food Policies and Regulations

Regulations and food policies can affect what people eat. Government initiatives like determining the taxes on sugary drinks can have an impact on what customers choose to eat.

3. Food Pattern

a. Definition of Food Pattern

According to the U.S. Department of Health and Human Services and the U.S. Department of Agriculture (2020), a Food pattern is defined as the assortment of foods and beverages that make up a person's total dietary intake throughout time. A food pattern reflects the current eating habits of a population or subgroup and provides insight into the types, combinations, and proportions of foods and beverages that should be consumed for optimal health.

A food pattern or also known as a dietary pattern refers to the quantities, proportions, variety, or combination of different foods and

beverages in diets, the frequency with which they are habitually consumed, as well as to the context in which foods are consumed" (National Academies of Sciences, Engineering, and Medicine, 2020).

b. Relation between Food Pattern and Food Choice

According to Glanz et al (2021) a number of elements, such as taste preferences, cultural standards, and social and economic circumstances, have an impact on people's food choices. These elements may also influence how eating habits form, which may have long-term consequences on health outcomes. Food choices influence the development of dietary patterns, and dietary patterns in turn affect food choices. A healthy dietary pattern is associated with a lower risk of chronic diseases, while an unhealthy dietary pattern is associated with a higher risk of chronic diseases (Qi et al., 2021).

Food patterns or dietary patterns are strongly associated with food choices, and they have been shown to be important predictors of health outcomes. Understanding the relationship between food choices and dietary patterns is essential for developing effective public health interventions to promote healthy eating" (Liu et al., 2021).

C. NUTRITIONAL STATUS

1. Definition of Nutritional Status

According to the World Health Organization (WHO, 2023), Nutritional status is the level of nutrition of an individual, group, or population as measured by various anthropometric, biochemical, clinical, and dietary indicators. The status of a person's health in relation to nutrient intake and use, as well as other elements like physical activity, stress, and illness that affect nutrient intake and utilization also define as nutritional status based on The Academy of Nutrition and Dietetics (AND, 2023).

Furthermore, The United Nations Children's Fund (UNICEF, 2023) defines nutritional status as the condition of an individual's health resulting from the intake and utilization of nutrients.

2. Nutritional Status Assessment

a. Anthropometry

Anthropometry, in general, refers to the size of the human body. Nutritional anthropometry is related to various measurements of body dimensions and body composition of various ages and nutritional levels (Supariasa and Bakri, 2014).

Anthropometry is commonly used to detect protein and energy intake imbalances. This imbalance is visible in the pattern of physical growth as well as the proportion of body tissues such as fat, muscle, and water in the body (Supariasa and Bakri, 2014).

1) The Advantages of Anthropometry

- a) The procedure is simple, safe, and can be used in large quantities of large samples.
- b) Relatively the measurement does not require experts
- c) This method is precise and accurate because it can be standardized
- d) The measurement can describe body history of an individual
- e) Generally the measurement can identify the nutritional status because there is already a clear threshold.

2) The Weakness of Anthropometry

- a) The measurement is Insensitive, meaning that this method cannot detect the state nutrition in a short time. Besides that, this measurement is not able to differentiate Deficiency of certain nutrients such as zinc deficiency.
- b) The factors outside of nutrition (disease, genetics, and decreased use energy) can reduce measurement specifications and sensitivity anthropometry.
- c) The errors that occur when measuring can affect the precession, accuracy, and validity of measurements.

b. Anthropometry Parameters

1) Age

Age plays a significant role in determining nutritional status. The incorrect age determination will cause the nutritional status to be interpreted incorrectly. If an accurate age determination is not made, correct height and weight measurements are worthless (Supariasa and Bakri, 2014).

2) Weight

Protein, fat, water, and mineral content of the bones are indicated by a person's body weight. Body fat tends to rise in adolescence, whereas muscle protein falls. A rise in bodily fluids is seen in those who have ascites and edema. Tumors can decrease fat and muscle tissue, especially in malnourished individuals (Supariasa and Bakri, 2014).

3) Height

Height is an important parameter for past and present circumstances if age is not precisely known. In addition, height is the second important measurement because by relating weight to height, the age factor can be ignored (Supariasa and Bakri, 2014).

c. Body Mass Index (BMI)

The nutritional status of adolescents can be determined in several ways, one of them by calculating Body Mass Index according to age (BMI/Age). Body Mass Index according to age (BMI/Age) is the ratio between body weight (Kg) and height (m²) (BMI) according to age (Age). The followings are the classification and thresholds (Z-score) of nutritional status (BMI/Age) for children aged 5-18 years according to the Regulation of the Minister of Health of the Republic of Indonesia No. 2 in 2020 about Child Anthropometry Standard.

Table 2. 2 Classification and Thresholds of Nutritional Status

Indicator	Classification of Nutritional Status	Z-Score
Body Mass Index according to age (BMI/Age)	Thinness	-3 SD to < -2 SD
	Normal	-2 SD to +1 SD
	Overweight	+1 SD to +2SD
	Obese	> +3 SD

Source: *Kemenkes RI, 2020*

3. Relation of Food Choice, Food Pattern, and Nutritional Status

Food choice determines nutritional status and in so far as there are influences of diet on health and disease (Committee on Medical Aspects of Food Policy, 1984; WHO, 1991), it is of vital importance to understand the processes by which choices are made. In particular, only with an adequate understanding of the reasons for people's choice of foods can we attempt to change choices and hence influence dietary patterns in line with recommendations from those involved in promoting health. These nutritional questions are potentially more complex than, for example, those which involve choices between brands of the same type of food, since they relate to choices between types of foods: choices which may lead, for example, to diets high or low in fat, or to diets high or low in salt content. Therefore, with an increasingly plentiful and varied food supply, the issue of the reasons for food choice becomes extremely important in the area of nutrition.

The relationship between food choice, food pattern, and nutritional status is well known and has received a great deal of attention in the scientific literature. In general, greater nutritional status and a decreased risk of chronic diseases are related with a healthy eating pattern, which is characterized by a high consumption of nutrient-dense foods and a low intake of processed and energy-dense meals.

The research conduct by Lê et al (2021) examined the association between food patterns and nutritional status among a sample of 5,662 US

adults aged 20-64 years. The study found that individuals who followed a healthy food pattern, characterized by high intake of fruits, vegetables, whole grains, and lean proteins, had a significantly higher intake of several key nutrients, including fiber, vitamin C, vitamin E, magnesium, potassium, and iron, compared to those who followed an unhealthy food pattern, characterized by high intake of processed and energy-dense foods.

Similarly, Kriaucioniene et al. (2020) observed that adhering to a healthy eating pattern was linked to superior nutritional status as determined by multiple nutrient status biomarkers, including serum levels of vitamin D, folate, and iron. A healthy eating pattern is linked to a lower risk of chronic diseases like cardiovascular disease, type 2 diabetes, and some malignancies in addition to better nutritional status. For instance, a prospective cohort study by Wang et al. (2021) discovered that maintaining a healthy eating pattern, which is characterized by a high consumption of fruits, vegetables, whole grains, nuts, and fish, was linked to a lower risk of cardiovascular disease and overall mortality. The majority of scientific research demonstrates the significance of choosing healthy foods and adhering to a healthy eating pattern in order to attain optimal nutritional status and lower the risk of chronic diseases.

Table 2. 3 Previous Study

No.	Researcher (Year) & Source of Journal	Article title and Journal Name	Research Design	Sample	Finding
1.	Maulida, R., Nanishi, K., Green, J., Shibamura, A., & Jimba, M. (2016). https://doi:10.1017/S136898001600094X	Food-choice motives of adolescents in Jakarta, Indonesia: the roles of gender and family income. <i>Public Health Nutrition,</i>	a cross-sectional study	The participants were public junior-high-school students in grades 7 and 8.	Three motives were obtained from factor analysis and reliability testing of the FCQ in these adolescents: ‘comfort’, ‘convenience and price’ and ‘health’. As judged from the means of the three subscales, ‘health’ was the dominant motive (i.e. it had the highest mean score). Second, food-choice motives were associated with family affluence and gender. The food-choice motive ‘convenience and price’ was more important for adolescents from less affluent families, and the food-choice motive ‘health’ was negatively associated with family affluence. Compared with female students, male students were more likely to consider health important
2.	Wahyuningtyas, R., Wisnusanti, S. U., & Kusuma, M. T. P. L. (2021). DOI:	Factors associated with food choice motives of adolescents in Yogyakarta Special	an observational study with a cross-sectional research design	adolescents aged 12-15 years old in Yogyakarta Junior High School	The results of the analysis based on the distribution of food choice motives showed that the main food choice motives of most respondents was health (45.45%), followed by natural content motives (23.97%), price (14.05%), and ethical concern (5.79%).

	https://doi.org/10.22146/ijcn.63152	District. <i>Jurnal Gizi Klinik Indonesia</i>			
3.	Radjah, A. C. L., Isaura, E. R., & Nadhiroh, S. R. (2022). https://garuda.kemdikbud.go.id/documents/detail/2786367	Association between Food Choice, Consumption Pattern, Nutritional Status, and Stress among The First-Year University Students in Surabaya. <i>Media Gizi Kesmas</i>	an observational study with a crosssectional research design	126 undergraduate students who studied as first year students in Universitas Airlangga, Surabaya	Majority of the respondents (89(72.4%)) in our study's results prefer health as the main aspect for food choices. Other side, respondents preferred mood as the main aspect (28(22.8%)), and convenience as the main aspect for respondents (6(4.9%)).
4.	Kolodinsky, J. M., Battista, G., Roche, E., Lee, B. H., & Johnson, R. K. (2017). https://www.sciencedirect.com/science/article/pii/S0966692317302466	Estimating the effect of mobility and food choice on obesity in a rural, northern environment. <i>Journal of Transport Geography</i>	a cross-sectional study	Respondent are who has Geospatial variables such the frequency of convenience stores, fast food, ski resort, and hiking trils within	Residing in a rural area becomes significant in the endogenous specification. Rural residents are 0.115 probability points less likely to be overweight. In the endogenous specification, gender becomes significant. Men are 0.06 probability points more likely to be overweight and 0.059 points more likely to be obese

				five miles of the respondents' home	
5.	Adeyele, T. K., Adeyele, V. O., & Akinbisoye, A. F. (2021) DOI: 10.47191/ijmra/v4-i6-01	Food Choice and Nutritional Intake of Children and Adolescents. <i>International Journal Of Multidisciplinary Research And Analysis</i>	a survey research design	254 participants within the age 9-11 (late childhood) and 12-18 (adolescent) in Ekiti state	The results of this study have shown the gender and age difference in food choice and nutritional intake of late childhood and adolescence. Data collected revealed that 58.3% of the respondents were male and 41.7% were female. Also, it showed the age range of the respondents 9-12 years were 28.7%, 13-15 years 23.2%, and 16-18 years 48%.
6.	Mikkelsen, B. E., Bucher, T., Hieke, S., Verain, M. C. D., & van den Puttelaar, J. (2016). https://www.capfoods.aau.dk/digitalAssets/201/201579_threeeurofoodlabspapersubmit.pdf	Measuring food choice and consumption behaviour with real, fake or virtual food realities—a comparative approach from the RICHFIELDS program. <i>Proceedings of Measuring Behavior</i>	a cross-sectional study	the Fake Food Buffet at ETH Zurich, the FoodScape Lab at Aalborg University, and the Restaurant of the Future at Wageningen University	The examples of lab facilities designed to experiment with behavioural nutrition presented in this paper all offer new potentials for convenient and easy data-collection about behavioural nutrition. While settings with real food have the advantage of presenting the most familiar context for participants, it also involves higher costs and less reproducibility than when using fake foods. Regarding virtual food reality, it can lower costs even more and facilitates data collection, but its higher unfamiliarity and unknown validity need to be taken into consideration

7.	<p>Lyerly, J. E., & Reeve, C. L. (2015). https://www.sciencedirect.com/science/article/pii/S0195666315000288</p>	<p>Development and validation of a measure of food choice values. <i>Appetite</i></p>	<p>a cross-sectional study</p>	<p>In aggregate, results from the four studies indicate that the measure is content valid, and has internally consistent scales that also demonstrated acceptable temporal stability and convergent validity. In addition, the eight scales of the measures were independent of social desirability, met criteria for</p>	<p>In aggregate, results from the four studies indicate that the measure is content valid, and has internally consistent scales that also demonstrated acceptable temporal stability and convergent validity. In addition, the eight scales of the measures were independent of social desirability, met criteria for measurement invariance across income groups, and predicted dietary intake.</p>
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				measurement invariance across income groups, and predicted dietary intake.	
8.	Mazzolani, B. C., Smaira, F. I., Esteves, G. P., Santo Andre, H. C., Amarante, M. C., Castanho, D., ... & Nicoletti, C. F. (2021) https://www.frontiersin.org/articles/10.3389/fnut.2021.664240/full	Influence of body mass index on eating habits and food choice determinants among Brazilian women during the COVID-19 pandemic. <i>Frontiers in nutrition</i>	a cross-sectional, self-reported, questionnaire-based survey	Participants were recruited through advertisements on social media platforms (Facebook®, WhatsApp®, Instagram®, Twitter®), press release, television, journals, and radio.	The main findings of this study were that: (i) eating habits changed due to the COVID-19 quarantine in Brazil, however, these differences were not impacted by BMI, apart from a more frequent report of “replacing main meals with snacks” in overweight vs. normal weight women; (ii) determinants of food choice differed as a function of BMI; (iii) determinants of food choice and psychological symptoms were associated with eating habits, with some of these associations being affected by BMI.

9.	Santanna MG, Lima ER, Matos TB, Anjos LA, Gomes JR and Milagres MP (2021) http://dx.doi.org/10.19080/PBSIJ.2021.17.555963	Assessment of Food Choices of University Students in Southwest Bahia. <i>Psychology and Behavioral Science International Journal</i>	a quantitative and descriptive study		it was possible to observe that factors: “price”, “health”, “sensory appeal”, and “convenience” were the most important factors for the students’ food choices.
10.	Purba, N. S. (2021). https://journal.iainlangsa.ac.id/index.php/jades	A Descriptive Quantitative Study of Students’ Anxiety in Reading and Writing in Learning English at the Eighth Grade of Mts Hadharatul Islamiyah Sipispis. <i>JADEs Journal of Academia in English Education</i>	Qualitative descriptive method	the eighth grade student of Mts Hadharatul Islamiyah	this study, the researcher found that the students’ anxiety in reading are categorized in low anxiety level there are 6 students (22%), students who categorized in medium anxiety there are 10 students (37%), and the high anxiety level are 11 students (41%). While in writing anxiety in this study shows that the students categorized in low anxiety level are 4 students (15%), in medium anxiety category are 13 students (48%), and the high anxiety category are 10 students (37%).