THE RELATIONSHIP BETWEEN DIET AND NUTRITIONAL STATUS BALANCE IN ADOLESCENTS

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Abstract
Background: Nutritional status is the end result of harmony between the intake of nutrients received by the body and the needs of nutrients needed. This balance determines a person's nutritional status, which can be divided into three categories: less, normal, or excessive. The adolescent phase is a crucial period in which nutritional needs increase significantly along with rapid physical growth and developmental processes. The transition from childhood to adolescence becomes a period in which the body requires more nutrients to support these changes. In addition to physical growth, factors such as lifestyle changes and the diet of adolescents also affect their intake and nutritional needs. An unbalanced diet or lack of attention to the nutrients needed can result in insufficient or excess nutritional status. This paper aims to determine the relationship between diet and nutritional status balance in adolescents. Method: This systematic review uses the PRISMA-P protocol (Preferred Reporting item for Systemic Review and Meta-Analysis Protocol). The study was collected through searches on Google Scholar and PubMed data sources ranging from 2018-2023. Keyword search using PICO-S (Population Intervention Technique Compare Results-Study). Results: Results from journals on Google Scholar and PubMed obtained 10 journals related to the title of literature review. Conclusions: From various studies in adolescents, it can be seen that there is a relationship between a healthy diet and a balance of nutritional status.
Keywords :Diet, Nutritional Status, Adolescents

INTRODUCTION

Adolescence becomes a complex transitional phase in a person's development, often characterized by the transition from childhood to adulthood. The age range between 13 to 20 years is often considered as adolescence, where the process of physical and psychological growth is very dynamic. This phase is crucial because the body is actively carrying out significant growth and adaptation to enter the maturity stage. Rapid physical growth is a major feature of adolescence. The body undergoes major changes in terms of height, weight, and the development of other organs. This process requires higher consumption of nutrients to support the growth of bones, muscles, and other organs. Nutritional needs in adolescents are much higher than in the past (1).

The importance of adequate nutritional intake during adolescence is undeniable. However, there are differences in nutritional needs based on each individual's physical activity and lifestyle. Adolescents who are active in sports or do intensive physical activity need higher nutritional intake to support energy expended and body recovery.(2) They require more protein to repair and build muscle, as well as complex carbohydrates for a sustainable source of energy. In addition, the variety

of nutrients is also important. Nutritional needs can vary depending on specific medical conditions or special situations, such as adolescents with special needs, certain medical conditions, or certain dietary preferences. For example, teenagers who are vegetarians need to ensure adequate vegetable protein intake to meet their body's needs.(3)

The challenge of ensuring adequate nutritional intake in adolescence is often related to lifestyle changes and eating habits. An unbalanced diet, consumption of high-fat fast food, or a tendency to consume processed foods have the potential to hinder the fulfillment of optimal nutritional needs. Therefore, proper nutrition education is very important. Adolescents need to be given a good understanding of the importance of nutrition in supporting growth, development, and overall health. This nutrition education can include information about healthy foods, the importance of variety in the diet, and how to maintain a balance of nutrients.(4)

In this context, the role of family, school, and community is very important. Families can set a good example by providing healthy meals at home. Schools can provide education on good nutrition and encourage healthy lifestyles. Meanwhile, society as a whole can create an environment that supports healthy food choices. In conclusion, adolescence is an important period that requires special attention to the fulfillment of optimal nutrition. With a good understanding of individual nutritional needs, a healthy diet, and a supportive environment, adolescents can enter adulthood in optimal health to lead productive and balanced lives (5).

Indonesia is faced with the problem of double nutrition. Based on the results of the 2018 Balitbangkes on the nutritional status of adolescents in Indonesia, it shows the prevalence of underweight in respondents based on BMI / U, which is 13.5% thin. The prevalence of obesity is 20.7% obese. The results of the Bengkulu Provincial Balitbangkes in 2019 showed that the prevalence in adolescents based on BMI / U was 10.7% underweight. The prevalence of obesity is 20.1% obese (6). The problem of deficiency and excess in the consumption of nutrients can have an impact on health, namely the problem of double nutrition, either the problem of undernutrition or overnutrition. The direct cause of nutritional problems, either more nutritional problems or less nutritional problems is an imbalance between food intake and the needs of the body and the presence of infectious diseases.(7)

One form of behavior change in adolescence is a change in diet, either leading to a good diet or tending to lead to a bad diet. A good diet should be accompanied by a balanced nutritional pattern, namely the fulfillment of nutrients that have been adjusted to the needs of the body and obtained through daily food. Diet shows how to meet nutritional needs for a person which is manifested in the form of consumption of types of food, the amount of food and the frequency of eating. Food sources of balanced nutrition are grouped, namely: energy sources, sources of building substances, and sources of regulatory substances. Food ingredients are staple foods, animal and vegetable protein side dishes, vegetables, and fruit.(8)

The literature review plays an important role in unraveling the complexity of the relationship between diet and nutritional status balance in adolescence. This research provides a strong foundation for understanding the factors that influence health through diet, and forms the basis for designing appropriate measures to improve

nutritional status and overall health in this group. The importance of a literature review lies in its ability to consolidate information from the various studies that have been conducted. By pooling data and findings from a wide array of related studies, this review makes it possible to identify eating patterns that have the potential to contribute positively or negatively to the nutritional status of adolescents.

MATERIALS AND METHODS

This systematic review uses *the PRISMA-P protocol (Preferred Reporting item* for Systemic Review and *Meta-Analysis Protocol)*. The study was collected through searches on *Google Scholar* and *PubMed* data sources ranging from 2018-2023. The author conducted a keyword search using *PICO-S (Population Intervention Techniques Compare Results-Study)* Nutrition Education, Influence Factors, Health, Healthy Diet.

Study Search and Selection Strategy

The method used to write literature reviews by searching for keywords; (1) Education (2) Diet (3) Nutritional Status.

Study Inclusion Criteria

The study inclusion criteria that we consider appropriate for systematic review are: (1) Target group: Early adolescence, (2) Results: The relationship between diet and nutritional status balance in adolescents, (3) Method: Literaur Review, (4) Studies discussed in Indonesian.

Study Exclusion Criteria

The author filters out irrelevant research titles and abstracts. The author has populusi, sampling, and methods, if the document does not discuss the relationship between diet and nutritional status balance in adolescents. The authors reviewed research written in Indonesian and English. Year restrictions are also in place in 2018-2023.

Data Extraction

The search for data on references and sources will begin in December 2023. Filtering is done based on relevant titles and abstracts from the full paper.
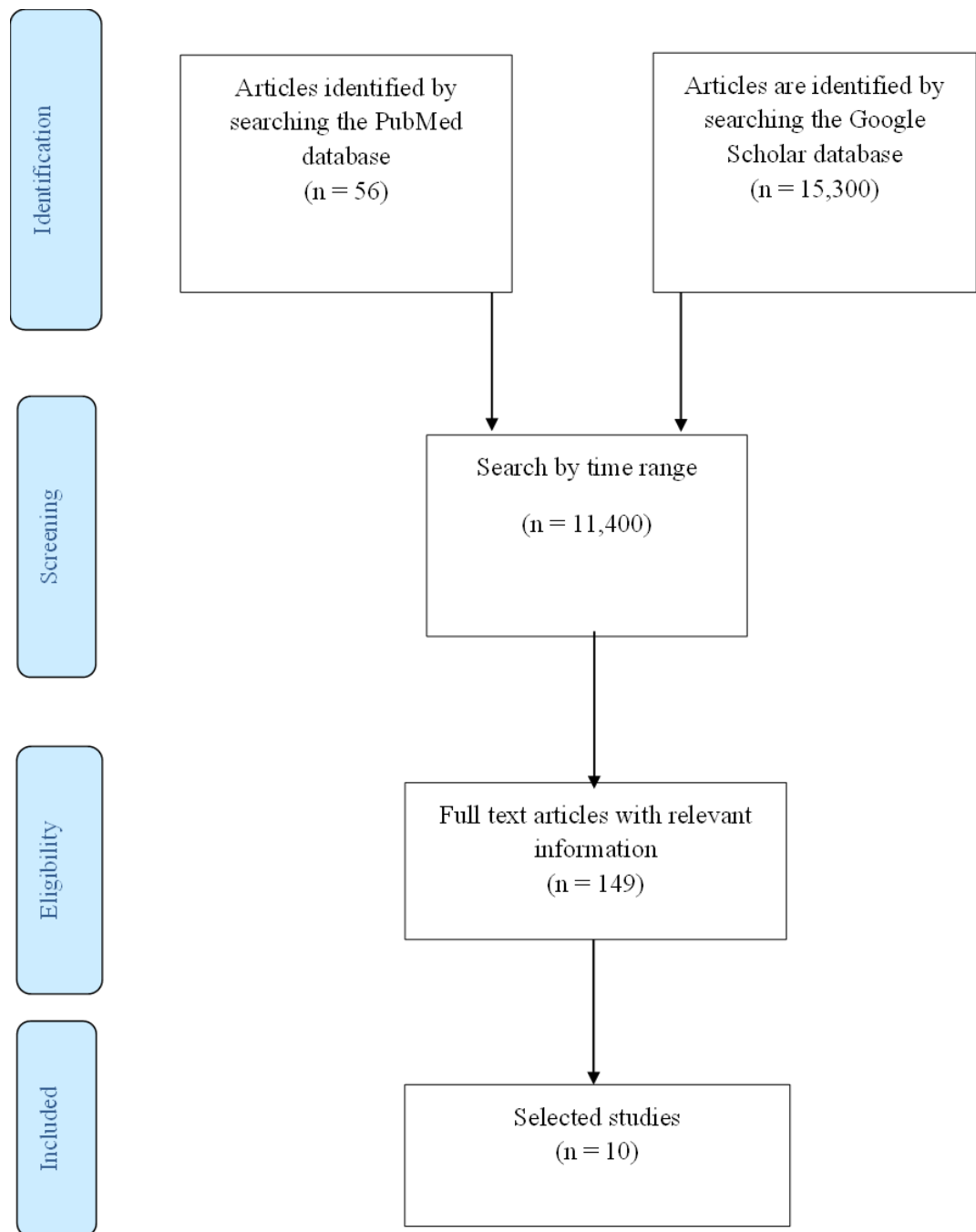
Figure 1. Search results selection flowchart

RESULTS AND DISCUSSIONS

No	Judul	Penulis	Tahun	Metode Pengumpulan Data	Hasil
1.	The relationship between eating habits and nutritional status in adolescents of Junior High School YLPI Pekanbaru	Dian Hafiza, Agnita Utami, Sekani Niriyah. (9)	2020	This type of research is quantitative research using correlation descriptive design and cross sectional approach. Study population: Adolescents at YLPI Junior High School Pekanbaru. Time and location of study: No specifics mentioned. Data collection methods: Use of Adolescent Food Habits Checklist (AFHC) questionnaire, weight measurement using "bathroom schale," and height measurement using "microtoise." Research design: Correlative-descriptive with a cross-sectional approach. Sampling method: Quota Sampling with a total sample of 76 respondents.	The results showed that P values (1 > 0.05) showed no significant correlation between eating habits and nutritional status of adolescents at YLPI Junior High School Pekanbaru. This indicates that eating habits do not have a significant direct influence on the nutritional status of adolescents in this school environment.
2.	The role of nutritional knowledge on energy intake, nutritional status and attitudes about adolescent nutrition	Ninda Rizki Aulia (10)	2021	The research design used a crosssectional approach using the random sampling method. Study population: Students at SMP N 02 Banjarharjo. Time and location of study: No specifics mentioned. Data collection methods: Use of interviews for nutrition knowledge data and nutritional attitudes, food frequency (FFQ) questionnaires for energy intake data, and measurements for student nutritional status data.	There is a relationship between Nutrition Knowledge on energy intake, nutritional status, attitudes about student nutrition at SMP N 02 Banjarharjo. Lack of nutritional knowledge is the beginning of nutritional problems in adolescents, where nutritional knowledge plays an important role in fulfilling balanced nutrition.

				Research design: Crossectional. Sampling method: Random Sampling with a total sample of 30 students from 2 classes IX at SMP N 02 Banjarharjo.	
3.	Protein, iron intake and nutritional status in adolescent girls	Martha Pitaloka Putri, Dary, Gelora Mangalik(11)	2021	This study was conducted with a cross sectional design with simple random sampling Study population: Students aged 15-18 years at SMAN 1 Kendal. Time and location of the study: November 2020-January 2021 at SMAN 1 Kendal. Data collection method: Weight and height measurement with digital and microtoise stepping scales. Protein and iron intake were measured using SQ-FFQ and 224-hour Food Record, and calculated with nutrisurvey software. Research design: Cross-sectional. Sampling method: Simple random sampling with 88 female students as research samples.	There was no association between protein intake with nutritional status and iron intake with nutritional status. Most of the female students had good nutritional status, adequate levels of excess protein, and adequate levels of iron deficit.
4.	The relationship of physical activity and diet to nutritional status in adolescents	Mellenia Dwiari Andya, Sopiyandi, Didik Hariyadi , Dahliansyah.(5)	2022	This type of research is qualitative research with literature review methods. Study population: Adolescents between 10-19 years old. Time and location of study: No specifics mentioned. Data collection method: Literature review with emphasis on summary review and author's thoughts on literature sources. Research design: Qualitative research with literature review method. Sampling method: There is no information about the sampling method because it is a	Based on a review of 16 journals discussing the relationship of physical activity and diet to nutritional status in adolescents, there were 100 samples in each study.

				literature review that uses existing sources.	
5.	The Relationship of Diet, Energy Adequacy, and Protein with Nutritional Status in Adolescents	Harvita Damara Utami, Kamsiah, Afriyana Siregar.(12)	2020	This study used cross sectional stratification technique random sampling. Study population: Adolescents aged 12-16 years at SMP IT Iqra, which amounted to 491 people with 88 people as a sample. Time and location of study: No specifics mentioned. Data collection method: Use of primary data with FFQ and Food Recall forms, as well as nutritional status measurement using scales and microtoise. Research design: Observational analytics with a cross-sectional approach. Sampling method: Stratification technique of random sampling with 88 respondents as sample.	As many as 34.1% had poor levels of energy adequacy who had abnormal nutritional status. The results of data processing using Chi-Square are known to be p-value = 0.035, so it can be concluded that there is a significant relationship between the level of protein adequacy and the nutritional status of respondents of SMP IT Iqra Kota Bengkulu in 2020. The results of the association size analysis (OR) of respondents with the category of poor protein adequacy have a 2.7 greater chance of having abnormal nutritional status compared to respondents who have good protein adequacy.
6.	The relationship between nutritional knowledge and food intake with the nutritional status of Mts Darul Ulum students	Puji Lestari(13)	2020	This study is a descriptive study with a cross sectional design. Study population: 8th and 9th grade students at Mts Darul Ulum, 51 people. Time and location of the study: September 2019-February 2020, the location of the study was not mentioned. Data collection method: Descriptive test with cross-sectional design, using Pearson and Spearman's rho correlation test.	The nutritional status of the majority of respondents was well nourished, namely as many as 40 female students (78.43%), only a few were undernourished, namely as many as 3 female students (5.88%), poor as many as 1 female student (1.96%) and more as many as 6 female students (11.76%). This reflects that the nutritional status of female students is in good condition.
7.	Factors Associated with Diet Quality	Nikmah Utami Dewi, Ali Khomsan,	2023	This study is an analytical observational study with a cross-sectional design using stratified random sampling.	Most teens had normal nutritional status (77.5%), with light activity levels (52.7%) and body image of

among Adolescents in Post-Disaster Areas: A Cross-Sectional Study in Indonesia	Cesilia Meti Dwiriani, Hadi Riyadi, Ikeu Ekayanti, Diah Ayu Hartini and Rasyika Nurul Fadjriyah.(14)		Study population: Adolescen aged 15-17 years, 375 people, represented those living in significant disaster-affected areas in Indonesia in 2018. Time and location of the study: The time of the study was not specifically stated, but the study was conducted in an area close to the area most affected by the disaster in 2018 in Indonesia. Data collection method: A cross-sectional study with data collection that includes adolescent and household characteristics, nutritional literacy, healthy eating behavior constructs, diet, nutritional status, physical activity, food safety, and diet quality. Desain penelitian: Cross-sectional study.	feeling fat or wanting to be thin (57.5%). No differences were observed between gender characteristics except for physical activity levels. Female participants were more sedentary (95.5%) than male participants (78.2%)
8.	Association between nutritional knowledge, protein-energy intake and nutritional status of adolescents	Antika Prycilla Veronika, Theresia Puspitawati, Ayu Fitriani(15)	2021	This study was an observational analysis with a cross-sectional design using stratified random sampling. Study population: Adolescents aged 15-18 years at SMK Muhammadiyah Mlati, Sleman Yogyakarta, as many as 58 people. Data collection method: Observational analytical study with cross-sectional design. Data retrieval using stratified random sampling technique. Research design: Cross-sectional. Sampling method: Stratified random sampling with a total of 58 adolescents as a research sample.	Based on the results, energy and protein intake is less. The results of the 3x24 hour recall showed that they had energy and protein intake deficits. Lack of energy and protein intake leads to inhibition of growth and maintenance of body cells, formation of important body bonds, and regulation of water balance.

9.	Nutrient Intake and Status of German Children and Adolescents Consuming Vegetarian, Vegan or Omnivore Diets: Results of the VeChi Youth Study	Ute Alexy, Morwenna Fischer, Stine Weder, Alfred Längler, Andreas Michalse, Andreas Sputtek and Markus Keller (16)	2021	The VeChi Youth Study used a cross-sectional method. Study population: Children and adolescents aged 6-18 years, consisting of 149 vegetarians, 115 vegans, and 137 omnivores. Time and location of study: No specifics mentioned. Data collection method: Cross-sectional study with anthropometric measurements, food intake, and nutritional status. Data were taken from three-day food records, nutrient biomarkers, and blood lipid concentrations. Research design: Cross-sectional study.	The results of the VeChi Adolescent Study confirm the position of several national nutrition or community children whose diets can be met by a vegetarian, including vegan nutritional needs recommended in childhood and adolescence. But because Cross-sectional design, VeChi Youth Study only provides a glimpse of plant-based diet and health in this age group.
10.	Eating behavior and nutritional status of adolescents	Ni Luh Agustini Purnama (17)	2019	This study is an observational study (non-experimental) with a cross sectional design. Study population: Adolescents at SMK Katolik Mater Amabilis Surabaya as many as 58 people. Time and location of study: No specifics mentioned. Data collection method: Cross-sectional study using simple random sampling technique. Research design: Cross-sectional. Sampling method: Simple random sampling with a total of 58 adolescents as a research sample.	Based on the results of the study, it was concluded that there was no relationship between eating behavior and nutritional status of adolescents.

The daily diet of adolescents has a significant impact on their nutritional status. The intake of certain nutrients such as proteins, carbohydrates, and fats becomes a key factor that affects the nutritional balance at this growth stage. Protein, as the main building material for cells, tissues, and muscles, plays an important role in the growth and maintenance of the body. When teenagers don't get enough protein, their growth can be stunted and their risk of developing health problems increases (1,15).

Carbohydrates, the main source of energy, also affect the nutritional balance of adolescents. Intake of complex carbohydrates from food sources such as whole grains provides stable and sustained energy. However, excess refined or simple carbohydrates can cause poor fluctuations in blood sugar and impact overall health. Fat, although often perceived negatively, is also important for teenagers. Healthy fats such as omega-3 and omega-6 fatty acids play a role in brain and nervous system development. However, excessive consumption of trans fats and saturated fats can increase the risk of heart and metabolic health problems. Therefore, the balance between the types of fat that adolescents consume also affects their overall nutritional status. By paying attention to the balance of intake of these nutrients in the daily diet, we can better understand how this relates to the health and nutritional status of adolescents. Some studies highlight certain aspects in relation to the intake of nutrients such as proteins, carbohydrates, and fats.(4)

The first study conducted by Dian Hafiza, Agnita Utami, and Sekani Niriyah in 2020 used a quantitative design with a cross-sectional approach. The results showed a correlation between eating habits and nutritional status in adolescents. However, the study did not specifically link intake of any particular nutrient to nutritional status.(18) In contrast, research conducted by Harvita Damara Utami, Kamsiah, and Afriyana Siregar in 2020 showed a significant relationship between protein adequacy levels and nutritional status in adolescents. These findings confirm that intake of certain nutrients, such as protein, plays an important role in determining the nutritional status of adolescents.(19)

However, results from the research of Martha Pitaloka Putri, Dary, and Gelora Mangalik in 2021 showed that there was no relationship between protein or iron intake and nutritional status in adolescent girls. Despite this, the study highlights that most female students have good nutritional status, but have excessive levels of protein adequacy and iron deficiency. In addition, research by Antika Prycilla Veronika, Theresia Puspitawati, and Ayu Fitriani in 2021 confirmed that lack of energy and protein intake can inhibit the growth and maintenance of body cells, and disrupt the balance of nutrients in adolescents (11)

Research on the relationship between daily diet and intake of certain nutrients, especially protein, and nutritional status in adolescents has been an interesting focus. Many studies have found a correlation between diet and intake of certain nutrients and the nutritional status of adolescents, specifically related to the importance of adequate protein intake to support the growth and development of their bodies. The importance of protein in the diet of adolescents cannot be ignored. These nutrients have a central role in building and repairing body tissues, including muscles, bones, and other vital organs. In times of rapid growth, such as adolescence, adequate protein intake is the key to supporting the process of forming a healthy and strong body.(1)

Studies have found that adequate protein intake in the diet of adolescents can make a significant contribution to their nutritional status. Adolescents with adequate protein intake tend to have better physical development, including optimal growth, adequate muscle strength, and better bone health. However, research results are not always consistent. Some studies may find a strong correlation between protein intake and nutritional status, while other studies may not find a significant association. This variability can be caused by many factors, including different research methods, differences in population samples, or even differences in the definition of adequate protein intake.

It is important to remember that nutrient intake does not stand alone in influencing the nutritional status of adolescents. Other factors in the diet, such as the consumption of vegetables, fruits, complex carbohydrates, healthy fats, also play an important role in creating a good balance of nutrients. Adolescent diets are also influenced by a variety of factors, including individual preferences, culture, accessibility to healthy foods, and socioeconomic factors. This suggests that gaining a deeper understanding of the interaction between intake of certain nutrients, especially protein, and nutritional status in adolescents requires a holistic and holistic approach (2).

Further research may consider individual variation in response to protein intake. Each individual's nutritional needs can vary based on genetic factors, physical activity levels, health conditions, and other factors. Accounting for this variability in studies can provide deeper insights into the relationship between protein intake and adolescent nutritional status. In addition, it is also important to explore the long-term effects of protein intake during adolescence. How protein intake in adolescence affects health in adulthood is something that needs to be better understood (20).

Results from these studies are not always consistent. Some studies may find a strong association between protein intake and nutritional status, while other studies may not find a significant correlation. This highlights the complexities involved in the interaction between intake of specific nutrients, such as protein, and nutritional status in adolescents. Therefore, there is an urgent need for further research that can explore more deeply the interaction between specific nutrient intake and nutritional status in the adolescent age range. Further research could include a more focused approach to observing adolescents' daily diets, while considering other factors that might affect their nutritional status (8).

One aspect to note in follow-up research is individual variation in response to intake of certain nutrients. Each individual's nutritional needs can vary based on genetic factors, physical activity levels, health conditions, and other factors. Considering this variability in research can provide a deeper understanding of the relationship between specific nutrient intake and nutritional status in adolescents. In addition, research approaches that involve direct measurement of nutrient intake, either through observation methods or food diaries, can also provide more accurate insights. This can be helpful in identifying specific eating patterns and clarifying their relationship with the nutritional status of adolescents (9).

It's important to remember that research into the relationship between specific eating patterns and nutritional status in adolescents is part of a broader understanding of their health. Optimal nutritional balance in the context of a healthy diet is an important, but not singular, factor in determining overall

nutritional status. Thus, further research that deepens understanding of the interaction between intake of specific nutrients, including protein, and nutritional status in adolescents is important. This will help in designing more appropriate and sustainable nutrition recommendations to improve the overall health of adolescents.

The frequency of consumption of nutritious food and fast food plays an important role in maintaining the balance of nutritional status in adolescents. Teens who regularly eat nutritious foods, which are rich in vitamins, minerals, fiber, and other essential nutrients, tend to have a better nutritional balance. Regular consumption of nutritious foods helps meet the body's nutritional needs necessary for optimal growth and development (11).

On the other hand, a high frequency of fast food consumption can contribute to nutritional imbalances in adolescents. Fast food tends to be low in essential nutritional value and often high in saturated fat, added sugar, and salt. This diet can lead to excessive calorie intake without providing adequate nutrition, which in turn can negatively impact nutritional status and also potentially increase the risk of overweight or obesity in adolescents, which is reflected in body mass index (BMI).

In addition, the correlation between the frequency of consumption of nutritious food and fast food with the balance of nutritional status of adolescents is also related to the level of energy and nutrients consumed. A diet consisting of nutritious foods often provides stable energy and meets the nutritional needs of the body. Conversely, high consumption of fast food often does not provide enough nutrients, causing energy and nutrient imbalances that contribute to long-term health problems. In this case, maintaining the frequency of consumption of nutritious foods and reducing fast food intake can support the balance of nutritional status and overall health of adolescents.

Based on a series of studies that have been conducted, there are several findings that provide insight into the relationship between the frequency of consumption of nutritious food and fast food with the balance of nutritional status in adolescents, especially in the context of body mass index (BMI), energy levels, and nutrients consumed. In a study conducted by Harvita Damara Utami, Kamsiah, and Afriyana Siregar in 2020, it was found that there is a significant correlation between the level of protein adequacy and nutritional status in adolescents. These findings indicate that the frequency of consumption of protein-rich foods may affect nutritional balance, with adolescents who have a protein deficiency having a higher chance of having abnormal nutritional status. The research of Martha Pitaloka Putri, Dary, and Gelora Mangalik in 2021 showed different results. Although there was no direct association between protein or iron intake and nutritional status in adolescent girls, the findings highlight that most female students have good nutritional status, but have excessive levels of protein adequacy and iron deficiency (11).

Antika Prycilla Veronika, Theresia Puspitawati, and Ayu Fitriani's research in 2021 also emphasized the importance of adequate energy and protein intake for adolescents. Lack of intake of these nutrients can inhibit the growth and maintenance of body cells, and disrupt the balance of necessary nutrients. However, not all studies have found a significant correlation between the frequency of consumption of certain foods and the nutritional status of

adolescents. For example, Ni Luh Agustini Purnama's 2019 study concluded that there is no direct relationship between eating behavior and adolescent nutritional status, suggesting a possible complexity in factors affecting nutritional balance in this age range (17).

While findings from the VeChi Youth Study conducted by Ute Alexy, Morwenna Fischer, Stine Weder, and colleagues in 2021 provide an idea of the possibility of meeting nutritional needs in childhood and adolescence through a vegetarian diet, including vegan. Nonetheless, due to the cross-sectional study design, the study only provides a surface view of the relationship between plant-based diets and health in that age group. Research related to the relationship between the frequency of consumption of nutritious foods and the nutritional status of adolescents has shown interesting findings. Several studies highlight a correlation between healthy eating habits, such as the frequency of consumption of nutritious foods, and optimal nutritional status in adolescents. However, the flip side of this picture is the complexity that arises from different factors that can affect the balance of nutrients at this age (2).

Understanding the relationship between healthy eating patterns and nutritional status in adolescents is an exciting yet complex area of research. Although the frequency of consumption of nutritious foods is considered important for maintaining a good nutritional status, research reveals a variety of factors that affect nutritional balance in this age group. These factors include individual preferences in food choices, propensity to consume less nutritious processed or fast food, and the social and economic environmental impact on healthy food accessibility.

The importance of the frequency of consumption of nutritious foods is in line with the maintenance of optimal nutritional status in adolescents. However, this importance often collides with individual preferences in food choices. Every teenager has different food preferences, which are influenced by cultural, environmental, and social factors. This leads to great variation in diet, even when it comes to choosing nutritious foods. In addition, the trend of consumption of processed or fast food that is less healthy also affects the nutritional balance of adolescents. Such foods are often rich in added sugars, saturated fats, and high sodium, while lacking essential nutrients such as fiber, vitamins, and minerals. This kind of food consumption habits can interfere with their nutritional status, although other diets are quite balanced.

Environmental, social and economic aspects also play an important role in the diet of adolescents. Accessibility to healthy food can be a problem in certain communities or neighborhoods, especially in areas with limited access to food markets that provide fresh and nutritious groceries. Economic factors can also limit food choices, where healthy foods are often more expensive than less nutritious fast or processed foods. This level of complexity indicates that the relationship between healthy eating patterns and nutritional status in adolescents is not simple. The large variability in the factors affecting their diet confirms the need for continued research (Utami, 2020).

Future research should lead to a deeper understanding of the factors that influence adolescent food choices, both in terms of individual preferences, environmental factors, and economic aspects. Observational studies involving a representative sample from a variety of social and economic backgrounds will provide greater

insight into adolescent diet dynamics. In addition, intervention studies that pay attention to adolescents' eating habits can provide a clearer view of how changes in environment or nutrition education might affect their diets. Identifying the best way to change unhealthy eating habits to more nutritious ones is an important step in improving the overall nutritional status of adolescents.

One factor that may influence is psychological or behavioral factors. Individual preferences, such as predisposition toward certain foods or food consumption habits that may be related to psychological factors, can play an important role in adolescent eating decisions. In addition, the presence of social pressure or the desire to conform to certain norms in their social environment can also affect their food choices. Cultural and environmental contexts should also not be ignored. Each culture has different food habits and preferences, and this can significantly affect the diet of adolescents. In addition, environmental factors such as accessibility to healthy foods, food prices, and promotion of less healthy foods also play a role in influencing their food choices.

CONCLUSIONS

It can be concluded that there is a correlation between the frequency of consumption of nutritious foods, especially those rich in protein, with the nutritional status of adolescents

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