

# PATTERNS OF FRUIT AND VEGETABLE CONSUMPTION AND PHYSICAL ACTIVITY IN PREVENTING HYPERTENSION IN ADOLESCENTS SURABAYA: A QUALITATIVE STUDY

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**PATTERNS OF FRUIT AND VEGETABLE CONSUMPTION AND PHYSICAL ACTIVITY IN PREVENTING HYPERTENSION IN ADOLESCENTS SURABAYA: A QUALITATIVE STUDY**

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Abstract

**Background:** Hypertension is a health problem in the world because it is the main cause of cardiovascular disease and the number one cause of death in the world every year. Research shows hypertension can occur in the adolescent age group and its prevalence continues to increase which is the cause of hypertension in adults and the elderly. The high prevalence of hypertension in adolescents is not only caused by genetic but also behavioral factors, including lack of consumption of fruits, vegetables and physical activity. This condition shows that there is still low consumption of vegetables and fruits as well as physical activity in adolescents so that they are at risk of suffering from hypertension in adulthood.

**Objectives:** To explore the consumption patterns of fruits, vegetables, and physical activity to prevent hypertension in students majoring in nursing at Sutomo Surabaya campus.

**Methods:** Qualitative research method with phenomenological approach. Data collection was carried out directly using in-depth interview method. Data analysis using content analysis and thematic analysis techniques.

**Results:** The results showed that students only consume certain types of fruits and processed vegetable forms, not all students consume vegetables and fruits every day and think that vegetables and fruits are useful for digestion, prevent various diseases including hypertension, maintain stamina and are fun foods. Most students like easy and light physical activity, although they rarely do it because of the busy work of college. Students think that physical activity is beneficial for preventing hypertension and obesity, forming a good physique and heart health, for fitness, skin health and the immune system.

**Conclusion:** Students majoring in nursing at the Sutomo campus have not maximally applied the pattern of consumption of vegetables and fruits, physical activity even though they already know the benefits in preventing hypertension.

**Keywords:** *Consumption of Vegetables and Fruits, Physical Activity, Prevention of Hypertension, Adolescents*

## INTRODUCTION

Hypertension or high blood pressure is one of the non-communicable diseases caused by circulatory disorders. Hypertensive disease is a health problem in the world because it is the main cause of cardiovascular disease in both developed and developing countries and the number one cause of death in the world every year. The prevalence of hypertension continues to increase, it is estimated that by 2025 the number of people with hypertension in the world will reach 1.5 billion and it is estimated that 9.4 million people die each year due to hypertension and its complications (Wijaya & Kumala, 2021). At this time adolescents experience many changes in themselves both physically and psychologically, individually and in their social roles in the family, school, campus and in the community (Suralaga C, Misgiati DE, 2023).

In community nursing services, adolescents are one of the targets of community nursing services, namely special group services. In general, hypertension occurs in the elderly population, but some studies show hypertension can occur in the adolescent age group and its prevalence continues to increase, but many are not aware that it is the cause of hypertension in adults and the elderly (Shaumi & Achmad, 2019).

The most common hypertension in adolescents is essential hypertension and hypertension caused by fetal disorders and congenital kidney disease since childhood. The high prevalence of hypertension in adolescents is not only caused by genetic factors but also due to risky behavioral factors, including lack of consumption of fruit vegetables and lack of physical activity (Kementerian Kesehatan Republik Indonesia (Ministry of Health of the Republic of Indonesia), 2021). The recommended consumption of vegetables and fruits according to the minimum intake recommendation of fruits and vegetables is as much as 400 grams per day, while a data states

that the daily consumption of fruits and vegetables of the Indonesian people is only 57.1 grams and 33.5 grams and adolescents are the group that consumes the least vegetables and fruits.

Based on data from the World Health Organization, WHO, one of the significant risk factors for chronic diseases including hypertension is low consumption of vegetables and fruits. Vegetables and fruits are foods that contain lots of fiber that functions, among others, to prevent obesity which is one of the risk factors for hypertension. If someone has been affected by hypertension, then the consumption of vegetables and fruits is an important part of blood pressure diet or Dietary Approaches to stop Hypertension (DASH). People with hypertension are recommended to consume vegetables and fruits as much as 4-5 servings per day. The results of Basic Health Research (Riskesdas) in 2018 showed that the prevalence of hypertension based on the results of blood pressure measurements in the age group of 18-24 years reached 13.22% and there were 13.3% of adolescents aged 15-19 years and 10.4% of adolescents aged 20-24 years who in one week did not consume fruit vegetables. The Riskesdas report also showed that adolescents who consumed less fruit vegetables were 96.4% in the age group of 15-19 years and 95.7% in the age group of 20-24 years. Adolescent physical activity was 49.6% in the age group 15-19 years and 33.2% in the age group 20-24 years in the less category (Tim Riskesdas 2018, 2019).

There is no valid data regarding the consumption of vegetables, fruits, and physical activity of students majoring in nursing at the Sutomo campus. Dense academic and non-academic activities where students must

be on campus from morning to evening cause students to be faced with conditions where they do not prepare their own food needs so they only consume what is already available in the canteen or stall. Even if someone brings provisions from home, the type of food brought is only rice and side dishes, very few include vegetables and fruits in the diet. Sutomo nursing students also rarely do physical activity because of the dense lecture activities, especially during practical learning carried out outside the campus, namely at Puskesmas, RS or Nursing Home. Joint gymnastics activities are only carried out 1 time in 1 week according to the program run by the nursing department. Adolescents have a scheduled and denser lifestyle, so they demand adequate, healthy and nutritious intake. High activity and body intake needs in adolescents must be accompanied by fruit and vegetable consumption. Fruits and vegetables are important components in a healthy diet and when consumed daily as needed can reduce hypertension, CHD and stroke, cancer, obesity in adolescents, type two diabetes and Alzheimer's (Qibtiyah et al., 2021).

Research shows a significant relationship between fruit consumption, and physical activity with hypertension (Aisaturrido et al., 2020). In addition, to maintain excellent body condition and ideal body weight, physical activity activities are also needed for students. Lack of physical activity can increase the risk of being overweight which will lead to hypertension. Lack of physical activity leads to a higher heart rate frequency which results in the heart muscle working harder with each contraction. The harder the effort of the heart muscle in pumping blood, the greater the blood pressure that is built on the walls of the arteries, causing an increase in blood pressure (Cristanto et al., 2021). Previous studies have concluded that there is a relationship between gender, nutritional knowledge, fruit and vegetable preparation skills, availability of

fruits and vegetables at home, parental support and peer support (Muna & Mardiana, 2019).

The results of a study conducted by Herdayati M, et al in 2022, showed that there was no relationship between physical activity, fruit consumption and routine health checks on the incidence of hypertension in equivalent high school students in the work area of the Sawangan Health Center. Meanwhile, another study found a significant relationship between fruit vegetable consumption and physical activity with hypertension (Aisaturrido et al., 2020). Meanwhile, based on Rview Literature conducted by Cristanto M, et al (2021) concluded that physical activity can prevent and protect against the risk and development of hypertension in young adults. Physical activity that can prevent hypertension is a type of strenuous physical activity while low-moderate physical activity protects against stress and is beneficial for mental health (Cristanto et al., 2021). This study was conducted to explore the pattern of consumption of vegetables, fruits, and physical activity of students majoring in nursing, Sutomo Surabaya campus with a qualitative phenomenological approach.

**Objective(s):** The aim of the study was to explain the pattern of consumption of vegetables, fruits, and physical activity to prevent hypertension in adolescents in the nursing department of Sutomo Surabaya campus.

## METHODS

### *Study Design*

The phenomenological approach is because researchers need to know in depth about the pattern of fruit vegetable consumption and physical activity of adolescents in the nursing department of Poltekkes Kemenkes Surabaya.

### Setting

The research was conducted at the Department of Nursing, Sutomo Campus, Poltekkes, Ministry of Health, Surabaya, Jln. 1 of. Moestopo 8 C, Surabaya in September 2023.

### Research Subject

The source of data in this study is students majoring in nursing at the Sutomo campus consisting of Diploma and Bachelor of Applied Nursing students in semesters I, III, V and 7. Data sources were selected by non-random sampling using purposive sampling techniques. Participants were selected by non-random sampling using purposive sampling techniques. The determination of the number of participants is considered sufficient if it has reached the level of "redundancy" (the data has been saturated,) meaning that if added informants no longer obtained significant new information (SUGIYONO, 2023).

### Data Collection

Data collection techniques were carried out using semi structured interview techniques that fall into the category of in-depth interviews. Data collection is carried out by researchers on data sources using interview guides. The source of the data in this case is that students of the Department of Nursing, Sutomo Campus, Poltekkes, Ministry of Health, Surabaya are given the opportunity to express their opinions and experiences in consuming vegetables and fruits and doing physical activity. Researchers record the opinions and experiences expressed by data sources using recording devices found on smartphones. Next, the recording results are written back to be displayed as a result of data collection.

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### Data Analysis

The data were analyzed using NVivo Version 12 Pro. Data analysis using content analysis and thematic analysis techniques.

Data analysis is performed using the following steps:

1. Write the results of interviews conducted with informants
2. Read the entire content or transcript of the interview and try to give meaning to the transcript data.
3. Coding, namely the process of reviewing and testing existing raw data by labeling in the form of words, phrases or sentences
4. Decide on a theme
5. Interpret the collected data concisely and systematically, make conclusions (Sitasari, 2022)

### Trustworthiness

To maintain the principle of data credibility in this study, using the triangulation technique is using reference materials in the form of audio-visual recordings when conducting in-depth interviews. The dependability test in this study was carried out by the auditor as evidenced by the existence of a research permit (Mekarisce, 2020)

### Ethical Consideration

The research was conducted by taking into account respondents' privacy and obtaining written informant consent. In addition, it has received a research permit from the Head of the Nursing Department of the Sutomo Campus was declared worthy of ethics by the Health Polytechnic Research Ethics Commission of the Ministry of Health with a certificate number EA/1986/KEPK-Poltekkes\_Sby/V/2023.

## RESULTS

### Informant Profile

The participants in this study were students majoring in nursing at the Sutomo Surabaya campus with an age range of 18 to 21 years. In some informants, further excavations were

carried out which became the reason for the love of fruit. The reasons presented are:

1. Fruit is a food that should be on the dinner table. Here is the informant's answer that explains it: *"Food that should be in the food I consume, but sometimes I don't cook it, depending on what I want to eat at that moment."* (informant 8). From these answers corroborate that informant 8, fruits and vegetables are foods that are considered important by millennial informants. This was corroborated by informant 7. *"If you eat without vegetables and fruits like something is lacking, if you eat fried foods, it has too much oil and it is not healthy while vegetables and fruits are a lot of fiber"* (informant 7)
2. Because fruit is a food that if it has been peeled just eaten. Another reason also conveyed by informant 1 related to fruit, because of the ease of fruit to be consumed which is a simple process just to peel and then ready to eat. Unlike vegetables, which sometimes still have to be cooked. *"Because it's peeled, just eat"* (informant 1)

Some respondents' answers related to fruit vegetables including what kind of food is more related to the function and meaning of eating fruits and vegetables, so that some answers become part of the function of fruits and vegetables.

Another topic discussed in this study is the pattern of physical activity or exercise in adolescents in the nursing department of Poltekkes Kemenkes Surabaya. The results of NVivo coding showed that 6 informants liked physical activity but stated that they rarely did, some said the reason was because of busy coursework.

*"In boarding houses rarely exercise"* (informant 10).

One informant expressed like, without mentioning the intensity of his exercise. The reasons presented by the informant related to liking physical activity: *"I think if you do it*

*every day, it can also good affect. Sports or physical activity are also important for humans, if for example all day we don't do anything it feels bad"*. (informant 3).

Then there are those who state doing it only on holidays. And there were two informants who said they did not like physical activity, felt lazy when they arrived at the boarding house. *"no, because you are lazy when you are already in the boarding house"* (Informant 9).

Seeing the answer that physical activity is rarely done by adolescents represented by students majoring in nursing Poltekkes Kemenkes Surabaya. Although the informant knew that exercise was important and necessary, in practice physical activity was not specifically scheduled.

### Theme

There are 4 themes in the pattern of fruit vegetable consumption, namely: the type of fruit vegetable that is preferred, the form of vegetable and fruit serving, the intensity of eating vegetables and fruit, the meaning and benefits of fruit vegetables. The pattern of physical activity / exercise has 2 themes, namely the form of physical activity and the meaning and benefits of physical activity.

Research result indicates the type of vegetable most often referred to by informants is spinach. One informant mentioned the reason for liking spinach because it is not very tasteful, the original taste. The second order is carrots, then some of the so-called informants are water spinach, cabbage and all green vegetables. These results show that informants were relatively familiar with some vegetables that were often on the dinner table, either served for sale or served at home to eat. The

results also indicate the type of fruit most often referred to by informants is bananas. The second order is orange and mango. Then some of the so-called informants are avocados, grapes, melons, papayas, watermelons and all kinds of fruits.

After knowing the most preferred types of vegetables and fruits, the next theme is the preferred form of fruit vegetable serving. Informants who stated that for vegetables that are preferred in the form of processed into clear vegetable soup, especially for the type of spinach which is the most popular type of vegetable. Furthermore, another variation of the answer is to sauté. While the form of presentation for fruit by eating directly as many as 7 informants. Then the informant who stated that he enjoyed fruit by way of juice there were 3 people, others also liked it when served in the form of *rujak* and fruit salad.

Informants who stated so were 1 person each. Here's the answer: *"If the fruit prefers even if it is given mixed with rujak spices."*

The habit of eating fruit vegetables in adolescents represented by poltekkes students is one of them measured by the intensity of eating vegetables and fruit. Some informants are students who do not live with people or (boarding children) so that these conditions affect the intensity of eating vegetables and fruits. This can happen because students get pocket money that is not large which allows them to buy, one of which is fruit.

Because fruit is a type of food that is quite expensive for students' pockets. *"If at home almost every day consume vegetables and fruit"*

However, some informants stated consuming fruit that consumed once every 2 days or 3 times a week. This means that the informant tries to meet the consumption of fruit in 1 week. While the informant who stated every day because he lived with his parents and had enough pocket money.

One of the concepts of phenomenological research is to look for

meaning in every activity carried out. In this study, informants also asked the meaning of fruit vegetables for informants. Extracting the meaning of vegetables and fruits for informants as one part of the phenomenological research process, namely informants interpret every activity or activity carried out.

Based on the results of informant answers coded using NVivo, there are 19 variations of answers to the meaning of vegetables and fruits for teenage informants. Here's the full answer:

The meaning and benefits of fruit vegetables for informants that most often appear is to improve digestion. The informant who stated this was 5 people. Then the source of nutritious food was also answered by 5 informants. Another meaning of fruit vegetables is to avoid disease answered by 4 informants. Then the meaning of other fruit vegetables answered by 3 informants is because fruit vegetables are good for the skin, meet the needs of fiber, healthy food sources. Then 2 informants linked it with the prevention of high blood pressure, according to the purpose of the study. Furthermore, another meaning that arises from good for the body to fruit vegetables is a food that can be fun. If grouping is carried out, the meaning of fruit vegetables can be grouped as follows:

1. Foods that are important for disease prevention, metabolism and maintaining health (high blood pressure, cholesterol, obesity, cancer, anemia, acne, canker sores, eyes, sugar disease). Informants give the meaning of fruit vegetables as one way to prevent various kinds of diseases from severe ones such as hypertension, cancer, cholesterol to minor diseases such as canker sores, acne, and anemia). This suggests the

role of fruit vegetables for the prevention of all kinds of diseases that adolescents understand.

2. Foods that are important for beauty. Informants give the meaning of fruit vegetables as one way to get beauty through skin beauty. Some informants mentioned the type of papaya fruit. The informant also stated that fruit vegetables can be used as masks for the face.
3. Foods that are important for emotional stability. Informants give the meaning of fruit vegetables as a way to maintain emotional stability because vegetable and fruit foods when consumed will make you happy.

The next theme in this study is the pattern of physical activity of adolescents in the nursing department of Poltekkes Kemenkes Surabaya. There are 2 themes of physical activity / sports patterns in this study, namely: the form of physical activity, the meaning and benefits of physical activity.

The informant's answer related to the most widely used forms of physical activity was the first most is morning runs and morning walks. While other forms of activity are badminton, cycling, push ups and even just waking up by warming up. Looking at the forms of physical activity mentioned shows that physical activity is relatively easy and can be done anytime and anywhere, except badminton which still requires courts, rackets and cocks.

The meaning and benefits of physical activity for informants that most often appear is to shape the body to be ideal. The informant who stated this was 3 people. Then for and meaningfully maintaining health was answered by 3 informants. Another meaning of physical activity is for the body to be fresh answered by 2 informants. Then the meaning of other physical activity answered by 2 informants was to sweat. Furthermore, other variations of answers submitted by informants are so that the body is not stiff, detox for the

body, fresh mind, to be more energetic, raise the mood to avoid disease. The variation of the answer was only coded 1 time submitted by the informant. Here are some of the informant's answers from the interview:

*"Physical activity prevents obesity and will prevent hypertension. Physical activity is also beneficial for heart health, fitness, physical shape, so as not to be fat, adolescents need to exercise to form a beautiful body"* (informant 1).

*"The body becomes fresh; the mind becomes fresh and can raise the mood and lose weight."* (informant 6)

*"Physical activity carried out regularly will prevent hypertension, strengthen muscles and improve the immune system"* (informant 6)

If grouping is carried out, the meaning and benefits of physical activity can be grouped as follows:

1. Physical activity with body goals  
Informants give the meaning of physical activity is an activity to shape the body to be more ideal, obesity does not occur. This is the main thing for informants to see from the appearance of answers 3 times. This can happen because appearance factors are often seen on social media, and because at the age when they have the opportunity to be obese.
2. Physical activity with the aim of endurance and disease prevention  
Informants give meaning to physical activity for the purpose of disease prevention. Although at their current age there is no specific disease, informants think that the meaning and benefits of physical activity are



to prevent diseases such as heart disease.

3. Physical activity with the aim of freshness of mind and mood

Informants give the meaning of doing physical activity to make the mind fresh and raise the mood. Although only one informant answered this question, this provides a relatively different variety of answers compared to other informants. At the age of those who are still in education, the meaning and benefits of physical activity for the purpose of freshness of mind and mood are things that can be socialized so that they are more enthusiastic in exercising and useful for their academic achievement.

### Consumption pattern of fruit vegetables to prevent hypertension

In accordance with the purpose of the study that this study will identify adolescent knowledge about the importance of fruit vegetable consumption patterns to prevent hypertension, informants also get questions related to this.

Research results shows that informants stated that the form of relationship between fruit vegetables and hypertension varies. Some state there is a relationship with giving examples of consuming dragon fruit can lower blood pressure for people with hypertension.

*"There is a fruit that if we consume it will make blood pressure go down, the fruit is Dragon fruit."* (informant 6)

However, other informants stated that the form of association was created through the mechanism of disease occurrence and immune system enhancement

*"Yes there is, currently I do not suffer from hypertension, but fruits affect the occurrence of disease and improve the immune system"* (informant 7)

*"Low fiber due to lack of consumption of fruit vegetables leads to obesity, causing high blood pressure"* (informant 1)

Other informants stated that there was a relationship, but the relationship was in the prevention of severity, not in curing, especially for those who already suffer from hypertension. There are informants who state spinach vegetables are not good for consumption for those who already suffer from hypertension:

*"Fruit vegetables cannot cure high blood pressure, can only prevent the severity of high blood pressure"* (informant 1)

*"Many think excess spinach consumption can cause an increase in blood pressure"* (informant 9)

There are also informants who state that there is no relationship between eating fruit vegetables and hypertension.

*"There was no association, hypertensive disease was not associated with vegetable and fruit consumption"* (informant 8)

Other informants who stated did not know, and but in their understanding watermelon fruit that can still be consumed by people with hypertension, without mentioning the benefits and effects of watermelon for people with hypertension.

*"I don't know enough, but as far as I know, people with hypertension can eat watermelon."* (informant 3).

### Physical Activity/Exercise Patterns to Prevent hypertension

In accordance with the purpose of the study that this study will also explore adolescent knowledge about

physical activity patterns to prevent hypertension, informants also get questions related to this. At the end of the interview, the informant was asked about the relationship between physical activity and hypertension, giving several views that from the NVivo coding can be divided into 8 variations of answers.

There were 6 informants stating that physical activity was related to efforts to prevent hypertension. Then in addition to preventing hypertension, physical activity can also form a stronger physique. Physical activity can prevent obesity, maintain heart health, improve fitness. Physical activity can burn calories so as not to become weak, make the skin healthy and the immune system good. Here are some interview results that underlie table 10:

*"There is, if physical activity is done regularly because the human body needs activities that can train muscle muscles for body fitness."* (informant 8)

*"Physical activity is associated with high blood disease, yes, because what pumps blood throughout the body if we continue to lie down or rest may not be optimal heart work. Exercise is also good for preventing obesity, so avoid heart disease. In addition, exercise is also important for adolescents for freshness and also to get a better and more attractive body shape"* (informant 2)

*"Physical activity is also beneficial for heart health, fitness, physical shape, so as not to be fat, adolescents need to exercise to form a beautiful body"* (informant 1)

With this answer, the informant confirmed that there was a link between physical activity and hypertension. In addition to preventing hypertension, exercise also provides several other benefits.

## DISCUSSION

### Vegetable and Fruit Consumption Patterns

The results of this study showed that all informants (100%) liked vegetables and fruits, although there were 3 informants (30%) who did not like all types of vegetables. The results also showed that there were 4 themes in the pattern of fruit vegetable consumption, namely: the type of fruit vegetable that is preferred, the form of vegetable and fruit serving, the intensity of eating vegetables and fruit, the meaning and benefits of fruit vegetables.

Based on type, the most preferred vegetables are spinach and carrots for reasons not too original taste. As for fruit, the most preferred is bananas and there are also informants who like all types of fruit. Next is the form of vegetable and fruit servings, most like vegetables that are processed in the form of clear vegetables (soup) and fruit mostly by eating directly. The intensity of fruit consumption is the most with an intensity of 1 time a day, and vegetable consumption is the most frequent intensity. The meaning and benefits of vegetables and fruits are most said to be beneficial for digestion and are a source of nutritious food.

Furthermore, the meaning of vegetables and fruits for informants is to avoid disease, prevent obesity and hypertension. There are still several other opinions that say that consumption of fruit vegetables is useful for reducing acne, for eye health, maintaining body stamina and interpreting fruit vegetables as pleasant foods.

The results of this study are different from research conducted by Mahful M, et al (2022) where there were 66.7% of adolescents who consumed less vegetables and 61.9% of adolescents who consumed less fruit. Although using

different methods, the study concluded that most adolescents have a level of vegetable and fruit consumption in the less category (Mahful, 2022). Meanwhile, another study showed that only 4.3% of teenagers in Jakarta consumed vegetables and fruit. In general, adolescents consume vegetables and fruits only 1/3 portion of the recommended WHO, which is > 400 g / day (An<sup>39</sup>aeni & Sudiarti, 2018).

The results of this study show that the most preferred types of vegetables are spinach and carrots, while the most preferred type of fruit is bananas and there are also those who like all types of fruit. Spinach is one type of vegetable that is rich in iron, calcium and antioxidants. In addition, spinach also contains a lot of vitamins K, A, and C, magnesium and folate. Vitamin K is essential for bones through increased calcium absorption (Faradiba, 2021). Experts say that colorful vegetables provide varied benefits for the body. Green vegetables serve to neutralize toxins in the body and make the body strong against disease. Red vegetables are beneficial for eye health. The fruit most favored by informants in this study was bananas. Bananas are fruits that are widely available in Indonesia and most liked by the public. The content contained in bananas is very beneficial for the body, namely high fiber helps in the digestive process. Bananas also contain very high potassium which is beneficial for heart health. In addition, bananas contain natural nutrients, namely fiber, pectin and resistant starch which are useful for maintaining blood sugar levels and regulating insulin production. Another content that is no less important contained in bananas is antioxidants that can ward off free radicals to the maximum and prevent dangerous diseases (Admin, 2022).

The next discussion in this study is the form of vegetable and fruit servings. The results showed that most like vegetables that are processed in the form of clear vegetables (soup). While fruit consumption, most say eaten directly and there are also those who say mixed with *rujak* spices or in the form of fruit

juice and fruit salad. The clear vegetable is one of the presentations of vegetables whose processing uses the boiling method. Boiling is one of the most common ways to cook vegetables because it is classified as easy, fast and versatile and can be done by all age groups, including teenagers. In this study, informants were students who had limited time to process vegetables so that if they had to process vegetables, they used the easiest method, namely boiling.

In addition, adolescents have limited skills in processing vegetables compared to adults (Leblanc, Ward and Leblanc, 2022) in (Access, 2022). Although most informants said that they consumed fruit directly, there were also those who consumed it in the form of fruit juice, fruit salad or mixed with rojak spices. There has not been much research on the form of fruit consumed, but from the answers of informants said that they consume fruit juice and fruit salad because it is easier to get it can be consumed immediately. While the informant who said consumption by adding rojak spice said that the fruit tasted better when added *rujak* spice. Some articles write about the benefits of fruit salad is to prevent various diseases including hypertension, maintain gastrointestinal health, maintain weight and maintain mental health (Bella, 2022).

The intensity of vegetable and fruit consumption patterns in adolescents majoring in nursing poltekkes kemenkes Surabaya varies. There are students who say fruit consumption once a week, 3 times a week and once a day. Likewise, with vegetable consumption there are those who say 1 time a week, occasionally and also those who say often. Students who said they often consume vegetables and fruits are likely to live with their parents so that the provision of fruits and vegetables does

not have difficulties. This is different from students who live in boarding houses, in addition to not having facilities to process vegetables, there may also be limited costs to buy fruit considering the price of fruit is also quite expensive<sup>27</sup>, and students prioritize buying other needs. The results of this study are not much different from other studies that say that adolescents consume an average of one serving of fruit per day and one and a half servings<sup>44</sup> vegetables per day. Likewise with the types of fruits and vegetables, the results of this study show that adolescents prefer bananas<sup>31</sup> and clear spinach vegetables (Qibtiyah et al., 2021). Based on the results of research, the meaning and benefits of vegetables and fruits revealed by informants consisted of 19 variations of answers. The most common answer is to improve digestion, and a source of nutritious food.

Furthermore, the informant answered the meaning and benefits of vegetables and fruits to avoid disease, good for the skin, prevent obesity and high blood pressure. Furthermore, the meaning and benefits of vegetables and fruits are grouped into three. The first group of vegetables and fruits is important for preventing disease, launching metabolism and maintaining health. Furthermore, the second meaning is that vegetables and fruits are good foods for beauty and the third meaning of vegetables and fruits is food to maintain emotional stability.<sup>2</sup> The results of this study are not much different from research conducted by Qibtiyah<sup>10</sup>, et al (2021), where informants said that fruits and vegetables<sup>10</sup> are foods rich in vitamins and minerals as well as a source of fiber that is beneficial for health. The informant also said that if you consume less vegetables and fruits, it will easily get sick and the digestive system is not smooth (Qibtiyah et al., 2021). The results shown by these two studies are in accordance with the theory<sup>15</sup> forward by some experts who say that vegetables and fruits are important foods that must be consumed every day. Vegetables and fruits

function as regulatory substances, contain vitamins and minerals, have high water content, a source of dietary fiber, antioxidants and can balance the body's acid-base levels (Sari, 2023).

Another thing conveyed by informants in this study is the benefits of fruit vegetables are good for the body, face masks and reduce acne, prevent high blood disease and are also a pleasant food. Vegetables and fruits are foods that contain fiber that serves to prevent obesity in adolescents. Fiber consumption can reduce fat and salt intake which will lower blood pressure and prevent weight gain. If weight gain can be controlled, teenagers<sup>41</sup> will have a good body shape. The results of the study proved<sup>24</sup> the lack of frequency of consuming vegetables and fruits is a risk factor for obesity in adolescents (Bey et al., 2020). The function of fruit related to face masks and reducing acne was stated by the Health Promotion team of RSUP dr. Soeradji Tirtonegoro Klaten. It is said that one of the benefits of fruit for the health of the body is to maintain healthy skin because fruit contains antioxidants that can ward off free radicals. With the presence of antioxidants derived from fruits will make the skin healthier including facial skin (Tim Promkes, 2023).

The meaning of fruit as a pleasant food was revealed by one informant in this study. Fun can be interpreted as happiness that shows one's mental health. Research conducted by Nell Ocean and Peter Howley shows that increased consumption of vegetables and fruits can improve mental health. It is also said that adding one serving of fruit or vegetable to the diet per day can benefit the health of the mind and this effect is the same as traveling outdoors or traveling (Ocean et al., n.d.).

### Physical Activity Patterns

The results showed that of the 10 informants interviewed, there were 6 informants who said they liked to do physical activities / sports but rarely did because of the busy college schedule, 2 informants said they liked to do physical activities / sports only on weekends and there were 2 informants who answered that they did not like physical activities / sports. The results of this study are in line with other studies where there are 86% of adolescents who agree and want physical activity / sports activities. Research also found that there are 12% of adolescents who do not do physical activity in a week, 41% do physical activity 1-2 times a week and 47% do physical activity 3 times a week (Rachman, 2018). The informants in this study basically liked physical activity / sports but were constrained by campus activities and busy lecture schedules so they rarely did it. Learning methods that require students to be present on campus (offline) cause students to find it difficult to carry out physical activity / sports regularly. Another study proved that in offline learning methods there were 65.1% of students with less physical activity category compared to online methods only 39.3% (Kurnianingsih et al., 2022).

Regarding the form of activity, informants in this study gave varied answers. There are 6 variations of informant answers regarding the form of physical activity / exercise performed. The most common forms of physical activity/exercise performed by informants are morning runs and morning walks. There are also those who cycle, badminton, but there are also those who only warm up after waking up. Looking at the form of physical activity / sport mentioned, shows that physical activity / sports carried out are relatively easy and can be done at any time. The results of this study are somewhat different from the study of junior high school adolescents where the results showed that physical activity / exercise in junior high school adolescents was mostly in moderate

category (55.2%) while the average (44.8%) included physical activity / light category sports (Mutia et al., 2022). Meanwhile, other studies show the same results as this study where the most physical activity carried out by students during the Covid-19 pandemic is light physical activity (Wungow et al., 2021). There are different types of physical activity in junior high school adolescents and college students due to increasing age (Arief et al., 2020). Physical activity / light exercise can improve immune function, more levels of immunity and last for a long time. While excessive or heavy physical activity / exercise will be able to interfere with immune function or immune suppression occurs (Scheffer & Latini, 2020) in (Ashadi et al., 2020).

The next discussion is the meaning and benefits of physical activity conveyed by informants. In this study, the most informants' answer was that physical activity was beneficial to prevent hypertension. Other benefits of physical activity / exercise according to informants are physical shape, preventing obesity, heart health and fitness. There are still other benefits stated by informants, namely burning calories, making skin healthy and maintaining immunity. Some previous studies have shown that high activity levels can improve fitness, resulting in the greatest benefit in efforts to prevent hypertension. Other studies have found that moderate physical activity is beneficial for treating stress and improving mental health. Related to the benefits of fitness, the results showed a relationship between high activity with cardiovascular fitness and prevention of cardiovascular disease. Meanwhile, another study said that students with high physical activity had lower BMI, body fat levels and waist and hip circumference compared to those who

6 stated low physical activity (Cristanto et al., 2021). The benefits of physical activity to shape the body can be associated with obesity conditions in adolescents. In general, teenagers want a slim body and no accumulation of fat. The results showed that adolescents who had low activity had a risk of 1.97 times greater excess fat mass compared to students who had high physical activity (Jaya & Kumala, 2020). The benefits of physical activity / exercise for skin health were also revealed by informants in this study. In addition to forming a good posture, physical activity / exercise is also beneficial for skin health. By doing aerobic exercise, it can increase blood flow to the skin which helps provide it with essential nutrients, hormones and oxygen. Aerobics can help increase the hormone cortisol to reduce stress and inflammation which both can trigger acne. Increased blood circulation to the skin also promotes healthy cell turnover and can help eliminate substances that the skin does not need. This causes the appearance of the skin, especially the face, to become brighter and supple (Wadrianto, 2021).

Physical activity / exercise has many benefits, especially for both physical health and mental and socioeconomic health. In general, the meaning and benefits of physical activity / sports are grouped into 3, namely: for body building, endurance and disease prevention, freshness of mind and mood. The benefits of exercise for physical health include reducing the risk of degenerative diseases, strengthening the heart muscle and heart capacity, preventing, lowering or controlling hypertension, forming posture and improving the immune system. While the benefits of exercise for mental health include increasing self-confidence, building sportsmanship, controlling stress, reducing anxiety and depression. The benefits of exercise for socioeconomic aspects include reducing medical costs, increasing productivity, increasing community movement of healthy people. Several things can be recommended regarding physical activity based on age and occupation.

For students it is recommended to do walking/cycling exercise to and from campus every day, structured exercise 2-3 times a week (fitness or swimming), late walking/cycling weekends further (Wicaksono, 2021).

The limitation in this study is that it only uses one data source or equivalent informant, namely students majoring in nursing at the Sutomo Surabaya campus. In addition, the data collection technique used only uses one way, namely the in-depth interview technique.

## CONCLUSION

46 The consumption pattern of vegetables and fruits of students majoring in nursing at the Sutomo campus is limited to certain types of vegetables and fruits, with not yet maximized intensity and a simple form of presentation, which is boiled and fruit eaten directly. The health benefits of vegetable and fruit consumption were revealed by most informants including benefits for preventing hypertension. The physical activity pattern of students majoring in nursing at Sutomo campus is limited to light activity and is generally carried out on weekends, although most informants know the benefits of physical activity for health including benefits to prevent hypertension.

## SUGGESTIONS

The results of the study can be used as a study to determine policies related to increasing the behavior of vegetable and fruit consumption as well as physical activity in adolescents in reducing the risk of hypertension. It is recommended that future researchers conduct research by adding data collection techniques with observation and varied data sources including main

informants, key informants and supporting informants.

1

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The author declares there is no potential conflict of interest.

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#### AUTHOR CONTRIBUTION

Lembunai Tat Alberta designed the study, collected and analyzed articles.

Dwi Utari Widyastuti: contributed to completion of research

Adivtian Ragayasa: contributed to completion of research

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