A Descriptive Study of Adolescent Lifestyle and Cardiovascular Disease Risk in Senior High School

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ABSTRACT

Introduction: Common adolescent behaviors such as consuming fast food, high-sugar beverages, lack of physical activity, and excessive screen time are major contributing factors to the emergence of CVD among youth. Early detection of risk factors during adolescence is essential to prevent the progression of CVD later in life.

Objective: This study aims to describe CVD risk factors among high school students.

Method: A descriptive design, data were collected through questionnaires distributed to 162 twelfth-grade students at a public senior high school in Tasikmalaya, using accidental sampling. Data were analyzed using descriptive statistics (frequency and percentage).

Result: The average age was 17 years, with the majority being female (63%). A total of 89.5% of respondents lived in urban areas, 63% showed a tendency toward light physical activity, 58.6% consumed junk food 1–2 times per week, 18.5% had a smoking habit, and 63% experienced significant stress.

Conclusion: These findings indicate that adolescents' current lifestyle is prone to CVD risk factors. Integrated interventions through health education in school and family environments are necessary to raise awareness of the importance of a balanced diet, adequate physical activity, and effective stress management to prevent the future development of CVD.

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INTRODUCTION

Worldwide, including in Indonesia, cardiovascular disease (CVD) is the leading cause of death. Data from the World Health Organization (WHO) show that CVD causes 17.9 million deaths each year, mostly due to unhealthy lifestyles. Major risk factors that emerge during adolescence include a sedentary lifestyle, consumption of high-fat foods, excessive stress, and harmful habits such as smoking and lack of sleep (World Health Organization (WHO), 2021a).

According to Abrignani and Luca (2019), adolescents are an age group undergoing rapid physical and mental development. However, as a result of technological advances and contemporary lifestyles, adolescents are often exposed to unhealthy habits, such as high-calorie diets, lack of physical activity, and high levels of stress. These habits not only affect short-term health but can also lead to serious health problems in the future, particularly those related to coronary heart disease.

Cardiovascular diseases such as hypertension, coronary heart disease, and stroke are often perceived as conditions that only affect adults. However, these diseases frequently originate from unhealthy lifestyles that begin during adolescence. Studies have shown that a sedentary lifestyle, high-fat and high-sugar diets, and smoking habits that emerge during adolescence can contribute to the development of cardiovascular diseases later in adulthood (Marques-Vidal, 2023; European Society of Cardiology, 2022).

Adolescence is a critical period for establishing habits that affect long-term health. However, the 2020 Riset Kesehatan Dasar (Riskesdas) in Indonesia revealed low adolescent awareness of the importance of a healthy lifestyle, with 30% of adolescents consuming fast food more than

three times a week and only 20% engaging in regular physical activity (Kemenkes RI, 2020). If these unhealthy lifestyle patterns continue, their risk of developing cardiovascular disease (CVD) at a young age increases significantly. Adolescents should have a better understanding of the importance of healthy eating, regular exercise, and avoiding smoking and behaviors that elevate the risk of heart and vascular diseases (CDC, 2024).

Research on the risk factors of cardiovascular disease (CVD) in adolescents has been widely conducted, identifying various factors such as hypertension, obesity, and poor physical activity as major contributors. For example, a study in Ponorogo found a prevalence of hypertension among adolescents at 35.7%, with inadequate physical activity identified as the dominant risk factor (Nurhidayat, 2014). Another study identified modifiable risk factors, including sodium intake, body mass index (BMI), physical activity, sleep quality, birth weight, smoking habits, and alcohol consumption, as well as non-modifiable factors such as gender and genetics (Rahma et al., 2021).

Other research findings also indicate that factors such as poor sleep quality, high body mass index (BMI), and a family history of hypertension are significantly associated with the incidence of hypertension among adolescents in Indonesia. Adolescents with poor sleep quality have a 4.1 times higher risk of developing hypertension, while a high BMI increases the risk by 4.85 times, and a family history of hypertension raises the risk by 3.9 times (Shaumi & Achmad, 2019).

In addition, changes in daily activity patterns due to excessive screen time, lack of physical exercise, and increased consumption of junk food and high-sugar beverages have not been widely studied in

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relation to cardiovascular health indicators in adolescents. The results of this study are expected to provide a more accurate picture of the current cardiovascular health status of adolescents and serve as a basis for more effective health promotion interventions in school settings. Thus, this study contributes to the early prevention of cardiovascular disease by highlighting the importance of adopting a healthy lifestyle from adolescence.

Early detection of risk factors during adolescence is crucial to prevent the progression of cardiovascular disease (CVD) later in life. Schools, as educational environments, play a strategic role in providing education and promotive interventions that can shape healthy lifestyle habits from an early age.

This study aims to describe the risk factors for CVD among high school students, so that it can serve as a foundation for formulating more effective prevention strategies to enhance adolescent awareness and cardiovascular health

METHOD

Research Design and Approach
A descriptive design with a quantitative approach, aiming to provide an overview or description of cardiovascular disease (CVD) risk factors among high school adolescents. This approach was chosen because the study focuses on mapping CVD risk factors among high school students without manipulating the variables under investigation (Notoatmodjo, 2014).

Research participants:
The study was conducted at a public senior high school in the city of Tasikmalaya. The population consisted of all third-grade students, totaling 300 students. The sample size was determined using Slovin's formula

with a standard error of 5% (e = 0.05). A total of 162 respondents were selected using accidental sampling. According to Sugiyono (2019), accidental sampling is a non-probability sampling technique in which samples are taken based on whoever happens to be available. The inclusion criteria established were: third-grade students, willing to complete the questionnaire, and without a previously diagnosed history of heart disease. The exclusion criteria included: students who were absent during data collection and those who were unwilling to participate in the study.

Instrument
The research instrument used was a questionnaire containing questions about respondent characteristics and lifestyle. The demographic questions included age, gender, parents' occupation, and place of residence. The lifestyle section covered eating patterns, physical activity, smoking habits, family medical history, and stress. Physical activity was classified into three categories: (1) Light (activities that do not cause fatigue, such as using a cellphone, watching television, reading books/novels, relaxing, or helping with light household chores), (2) Moderate (activities that cause moderate fatigue, such as jogging around the house, walking less than 3 km, or helping with household chores like sweeping the yard, mopping, or doing laundry), and (3) Vigorous (activities that cause significant fatigue, shortness of breath, and profuse sweating, such as digging, lifting heavy objects, running, walking more than 3 km, or doing fitness exercises).

Data analysis
The data analysis technique used univariate analysis by examining the frequency of the sub-variables studied (physical activity, family history of heart disease, frequency of junk food consumption, frequency of fruit

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and vegetable intake, exercise time per week, smoking habits, and stress).

RESULTS AND DISCUSSION

Result
The research was conducted at a public senior high school in the city of Tasikmalaya, with a sample of 162 twelfth-grade students. The average age was 17 years, with the youngest being 16 years old and the oldest 19 years old.

Tabel 1 Respondent Characteristics

Sub-Variabel	Frequency (n)	Percentage (%)
Gender		
- Male	60	37,0
- Female	102	63,0
Total	162	100,0
Residence		
- City	145	89,5
- Village	17	10,5
Total	162	100,0

Tabel 2 Teenage Lifestyle

Sub-Variabel	Frequency (n)	Percentage (%)
Physical Activity		
- Light	94	58,0
- Medium	58	35,8
- Heavy	10	6,2
Total	162	100,0
Family History of Heart Disease		
- There is	24	14,8
- There isn't	138	85,2
Total	162	100,0
Junk Food Consumption per Week	7	4,3
- Never	95	58,6
- 1-2 times	41	25,3
- 3-5 times	19	11,7
- Every day		
Total	162	100,0
Consumption of Fruit and Vegetables		
- Yes	94	58,0
- No	68	42,0
Total	162	100,0

Sub-Variabel	Frequency (n)	Percentage (%)
Time Spent on Exercise in a Week		
- Never	7	4,3
- 1-2 hours	112	69,1
- 3-5 hours	43	26,5
Total	162	100,0
Smoking Habit		
- Yes	30	18,5
- No	132	81,5
Total	162	100,0
Often Stressed		
- Yes	102	63,0
- No	60	37,0
Total	162	100,0

Discussion
Adolescents' lifestyle has a significant impact on their future health, particularly regarding heart disease. From an early age, there is an increased risk of hypertension, obesity, and metabolic disorders due to changes in dietary patterns, a predominantly sedentary lifestyle, and habits such as smoking and alcohol consumption (World Health Organization (WHO), 2021b).

The results showed that the study respondents were senior high school students with an average age of 17 years, with the majority being female. Adolescents today are undergoing physical, psychological, and social changes that influence their daily routines. Erikson (1968) stated that the developmental stage of adolescence is characterized by the search for identity and independence, which often affects their food choices, physical activity, and other health-related habits.

The majority of respondents in this study were female, which aligns with the national trend indicating that the number of female students at the senior high school level tends to be higher than that of male students. According to data from the Badan Pusat Statistik (BPS) in 2023, the

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percentage of female students in senior high schools reached 52.3%, slightly higher than that of male students.

The research findings showed that 89.5% of respondents lived in urban areas. Adolescents living in urban environments have a higher risk of developing cardiovascular disease (CVD) compared to those living in rural areas. Various lifestyle components, environmental factors, and exposure to stress contribute to this. Urban life often promotes a more sedentary lifestyle, such as watching TV, playing video games, or using electronic devices for extended periods. In addition, modern transportation convenience reduces the need for walking or cycling, which in turn lowers physical activity levels. The primary factor increasing cardiovascular risk among adolescents is a lack of physical activity (World Health Organization (WHO), 2022).

Compared to rural areas, access to fast food and sugary drinks is easier in urban settings. Cardiovascular disease risk factors such as obesity, hypertension, and dyslipidemia increase as a result of these dietary patterns (Malik, et al., 2020).

Cardiovascular disease prevention targeting adolescents living in urban areas should take into account lifestyle and environmental changes, such as providing more green spaces, promoting physical activity, controlling air pollution, and offering education on healthy eating habits. These interventions can help reduce the elevated risk associated with urban living.

Fifty-eight percent of respondents engaged in light physical activity on a daily basis. Light activities are those that do not cause physical fatigue, such as using a mobile phone, watching television, reading books/novels, relaxing, or helping with light household chores. Moderate activities are those that cause a moderate level of

tiredness, such as jogging around the house, walking less than 3 kilometers, or doing household chores like mopping, laundry, and sweeping the yard. Vigorous activities are those that lead to significant physical exhaustion, shortness of breath, and heavy sweating, such as digging, lifting heavy objects, running, walking more than 3 kilometers, or doing intense exercise.

Based on the study results, it was found that most adolescents engage in insufficient physical activity. Adolescents tend to prefer light activities over moderate or vigorous ones. This may be due to several factors, including: (1) Changes in Social Patterns and Technology. Technological advancements, such as smartphones, social media, and streaming videos, have shifted adolescents away from physical activity toward sedentary behavior. Adolescents often spend a large portion of their time sitting—studying, playing games, or browsing the internet. One study reported that adolescents spend an average of 6–8 hours per day on sedentary activities, including watching TV and using electronic devices (Garcia-Hermoso et al., 2021); (2) Lack of Motivation and Social Support. Adolescents often have low motivation for physical activity due to the lack of support from their social environment, including family and peers. Social support plays an important role in adolescent physical activity. A study found a correlation between social support from family, peers, and schools and the level of physical activity among adolescents (Lin et al., 2024).

Not all adolescents understand the importance of engaging in moderate or vigorous physical activity for their health. The lack of education leads to a limited awareness of the health risks associated with a highly sedentary lifestyle. According to the World Health Organization (WHO) in 2021, adolescents in many countries spend most of their time in sedentary

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activities, primarily due to the increased use of digital technology (World Health Organization (WHO), 2021c).

One of the risk factors for heart disease in adolescents is a family history of heart disease. This factor is crucial as it involves genetic predisposition, environmental influences, and inherited lifestyle habits (World Health Organization (WHO), 2021a). Although the study found that only 14.8% of respondents had a family history of heart disease, further investigation is still needed, considering that many heart conditions can be asymptomatic.

According to the study findings, siblings of cardiovascular disease (CVD) patients have an estimated risk of around 40%, while offspring of parents with CVD have a risk ranging from 60% to 75% (Kolber & Scrimshaw, 2014). Being aware of a family history of disease can help prevent CVD from an early age. Increasing physical activity, adopting a healthy diet, and undergoing routine health check-ups are recommended to identify and manage risk factors such as high blood pressure and cholesterol.

Ninety-five (58.6%) respondents consumed junk food 1–2 times per week, while 19 (11.7%) consumed junk food daily. These findings indicate that the majority of respondents consumed junk food more than once a week.

Nowadays, adolescents often consume junk food, which typically contains high levels of calories, sugar, salt, and trans fats, but lacks fiber and essential nutrients. Through various physiological and behavioral mechanisms, the habit of consuming junk food can increase the risk of cardiovascular disease (CVD).

Adolescents who excessively consume junk food are likely to have an excessive calorie intake due to the high energy content of such foods. This calorie accumulation can lead to obesity, which is one of the main risk factors for coronary heart disease. Furthermore, the high levels of trans fats and saturated fats in junk food can lead to an increase in low-density lipoprotein (LDL), or 'bad cholesterol,' and a decrease in high-density lipoprotein (HDL), or 'good cholesterol.' These changes in lipid profiles contribute to atherosclerosis, which is the buildup of plaque on arterial walls (Sack et al., 2017).

According to research conducted by Shrestha and Copenhaver (2015), cardiovascular disease (CVD) risk factors during childhood are associated with modifiable risk factors, with unhealthy eating habits being one of them. The data show that 41 respondents (25.3%) consumed junk food three to five times per week. This finding is consistent with the 2020 Basic Health Research (Rikesdas) data, which revealed that 30% of adolescents consumed fast food more than three times per week (Kemenkes RI, 2020). A total of 42% of respondents did not consume fruits and vegetables. Processed or fast foods with strong savory or sweet flavors are generally perceived as more appealing than fruits and vegetables. Because they offer a more satisfying taste, many adolescents tend to choose foods that are high in sugar, salt, and fat.

The habit of eating fruits and vegetables can also be influenced by family eating patterns. If parents do not accustom their children to eating fruits and vegetables from an early age, it is likely that the habit will not carry over into adolescence.

Many adolescents only spend 1–2 hours per week exercising, which is far below the recommendation from global health organizations such as the World Health Organization (WHO), which advises at least 150 minutes of moderate-intensity physical activity per week for children aged

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5–17 years (World Health Organization (WHO), 2020). This may be due to academic demands, lack of motivation and awareness, or the influence of the social environment.

A total of 30 respondents (18.5%) reported having a smoking habit. Smoking among adolescents is one of the harmful behaviors that has serious health consequences, including an increased risk of cardiovascular disease (CVD). This habit is often influenced by social, psychological, and environmental factors.

he World Health Organization (WHO) states that around 90% of adult smokers start smoking before the age of 18. According to data from the Global Youth Tobacco Survey (GYTS), an average of 7–25% of adolescents report smoking actively. The prevalence of smoking among adolescents varies across countries (World Health Organization (WHO), 2021d).

Peers, tobacco advertising and marketing, and the family environment are some of the factors that can influence adolescent smoking habits. Smoking has a significant impact on adolescents, including direct effects on the heart and lungs, as well as addiction and long-term health risks. It is crucial to take comprehensive measures to prevent adolescents from smoking, such as providing education about the dangers of smoking in schools, implementing smoking bans in public places, and, most importantly, strengthening the role of families in preventing their children from being exposed to smoking habits.

A total of 102 respondents (63%) reported that they often experience stress. Stress is a physical and mental condition caused by an imbalance between a person's demands and their ability to cope. Stress is a common issue among adolescents and can increase the risk of cardiovascular disease (CVD) if not properly managed. Adolescent stress is typically caused by academic pressures (such as the demand to achieve), social problems (such as peer pressure), family conflicts, and uncertainty about the future.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions
Research on adolescent lifestyles and cardiovascular disease (CVD) risk factors in Senior High Schools found that most adolescents have lifestyles that increase the risk of cardiovascular disease in the future. The main factors identified in this study include high stress levels, smoking habits, unhealthy eating patterns, and low levels of physical activity.

Suggestion
The results of this study indicate that adolescent lifestyles need greater attention to prevent cardiovascular disease. Improved health education, increased awareness of the importance of physical activity, healthy food policies in schools, and better stress management programs are needed. The quality of life for future generations can be improved by adopting healthier lifestyle changes from a young age, which can reduce the risk of cardiovascular disease.

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