

The Effect of Physical Activity on Blood Pressure in the Community of Tumbang Tahai District, Palangka Raya, Indonesia

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ABSTRACT

Background: Cardiovascular diseases, including hypertension, pose significant health challenges globally. Physical activity has long been recognized as a modifiable factor that can influence various aspects of cardiovascular health, including blood pressure. However, the relationship between physical activity and blood pressure is complex and can be influenced by various factors such as cultural and regional differences.

Aims: The primary objective of this research was to examine the association between physical activity and blood pressure using a quasi-experimental design.

Methods: This study utilized a quasi-experimental design with a one-group pre-test post-test approach. The sample was selected using a total sampling technique. The independent and dependent variables in this research were physical activity and blood pressure. Data collection instruments employed in this study consisted of observation sheets, an aneroid sphygmomanometer, and a stethoscope. Data analysis was performed using the Wilcoxon test.

Results: This study showed that there was an association between physical activity and blood pressure.

Conclusion: this research sheds light on the relationship between physical activity and blood pressure. The findings underscore the importance of considering cultural and regional factors in designing health interventions.

Keywords: *Physical Activity, Blood pressure, Hypertension.*

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1. Introduction

Physical activity refers to any body movement generated by skeletal muscles that requires energy expenditure. Insufficient physical activity is a risk factor for chronic diseases and is estimated to cause global mortality (World Health Organization, 2022). Humans never cease to move, even during sleep, as the heart continues to pump blood throughout the body unconsciously. However, with the advancement of technology in various fields, awareness of the importance of physical activity for human health has diminished. Increasing physical activity in individuals leads to a greater demand for oxygen-containing blood, which the heart meets by increasing blood flow.

Blood pressure is significantly influenced by several factors, including cardiac output, arterial tension, blood volume rate, and blood viscosity. Blood pressure is typically expressed as the ratio of systolic pressure to diastolic pressure, with normal adult values ranging around 120/80 mmHg. Lack of physical activity increases the risk of developing hypertension due to an increased risk of being overweight. Individuals who engage in less physical activity tend to have a higher heart rate, causing the heart muscles to work harder with each contraction. The harder and more frequent the heart muscles have to pump, the greater the pressure imposed on the arteries. Elevated blood pressure resulting from insufficient physical activity can lead to complications such as coronary heart disease, kidney function disorders, stroke, and more.

Hypertension can lead to permanent disability, sudden death, and fatal consequences. Therefore, efforts to prevent and manage hypertension need to be carried out by increasing public awareness and adopting healthier lifestyles (Kementerian Kesehatan Republik Indonesia, 2019).

Data from the 2018 Riskesdas (National Basic Health Research) revealed that the prevalence of hypertension in Central Kalimantan reached 34.47%, compared to 26.7% in 2013, indicating a substantial increase within a 5-year period, which can be classified as high. Data from the World Health Organization (WHO) in 2019 indicates that approximately 1.13 billion people worldwide suffer from hypertension, with two-thirds of cases occurring in low- and middle-income countries. The prevalence of hypertension in Indonesia reaches 34.1%, with a total of 63,309,620 cases. The 2018 Basic Health Research reported a hypertension rate of 34.1% among individuals aged 18 and older. It stands at 31.6% for those aged 31-44, 45.3% for those aged 45-54, and 55.2% for those aged 55-64. Among the 34.1% of the population with hypertension, only 8.8% are diagnosed with hypertension, 13.3% of diagnosed individuals do not take medication, and 32.3% of hypertensive individuals do not regularly take their prescribed medication. A significant 58% of hypertensive patients do not take medication because they feel healthy. This research aims to investigate the influence of physical activity on blood pressure (Kementerian Kesehatan Republik Indonesia, 2019).

2. Methods

This study is a quasi-experimental research with a one-group pre-test post-test design. The research was conducted in the Tumbang Tahai neighborhood, Bukit Batu Sub-district, Palangka Raya City. The sample was selected using total sampling technique, consisting of 41 respondents. The independent and dependent variables in this study are physical activity and blood pressure. The research instruments used were observation sheets, an aneroid sphygmomanometer, and a stethoscope. Data analysis was conducted using the Wilcoxon test.

3. Results

The exploration of the study's outcomes is two-fold, delving into the intricate details of participant demographics and the consequential impact of physical activity on blood pressure within the community of Tumbang Tahai. Together, these sections weave a comprehensive narrative, starting with participant characteristics and leading to a profound understanding of the impact of physical activity on blood pressure in the specified community context.

3.1 Gender and Age Group Distribution

Out of the 41 respondents who participated in this study, 29 (70.73%) were female, and 12 (29.27%) were male. There was 1 individual aged 17-25 years (2.44%), 4 individuals aged 26-35 years (9.76%), 8 individuals aged 36-45 years (19.51%), 12 individuals aged 46-55 years (29.27%), 11 individuals aged 56-65 years (26.83%), and 5 individuals aged >65 years (12.20%).

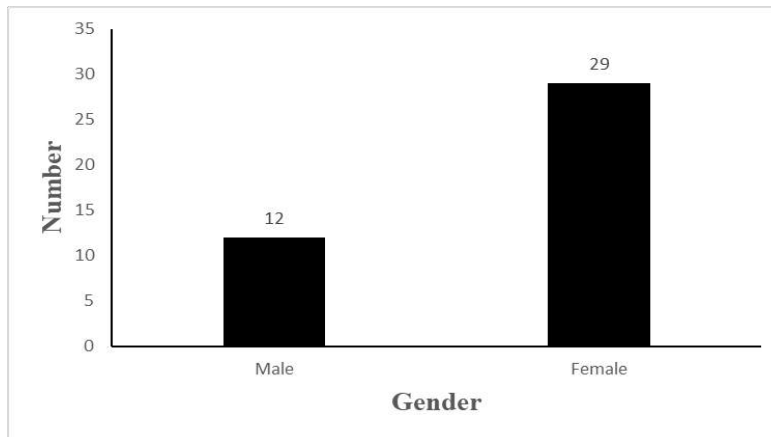


Figure 1. Gender Distribution

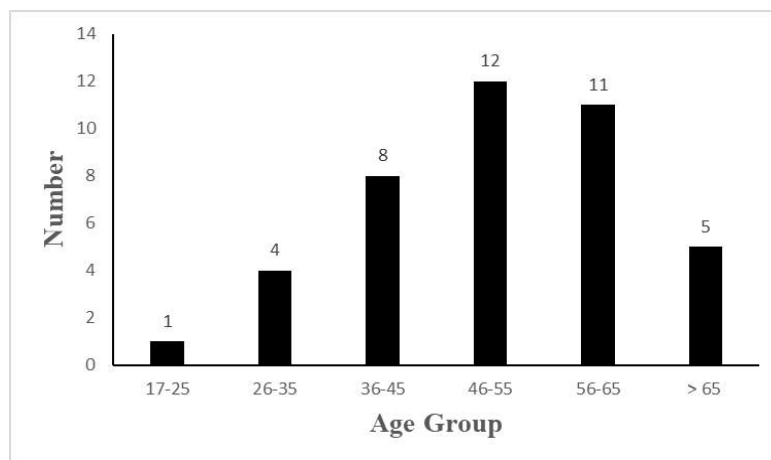


Figure 2. Age Distribution

3.2 Comparison of Pre-Post Blood Pressure Results

The analysis of the influence of physical activity on blood pressure in the community of Tumbang Tahai, as determined by the Wilcoxon test, yielded a P Value Sig. (2-tailed) = 0.05. This result indicates that the P Value is <0.05, thus rejecting H_0 and accepting H_1 . Therefore, it can be concluded that there is an influence of physical activity on blood pressure. This study was conducted on 41 respondents in the Tumbang Tahai neighborhood, with 29 females (70.73%) and 12 males (29.27%). Based on the analysis using the Wilcoxon test, a result of P Value Sig. (2-tailed) = 0.005 was obtained. This indicates that there is an influence of physical activity on blood pressure in the community of Tumbang Tahai.

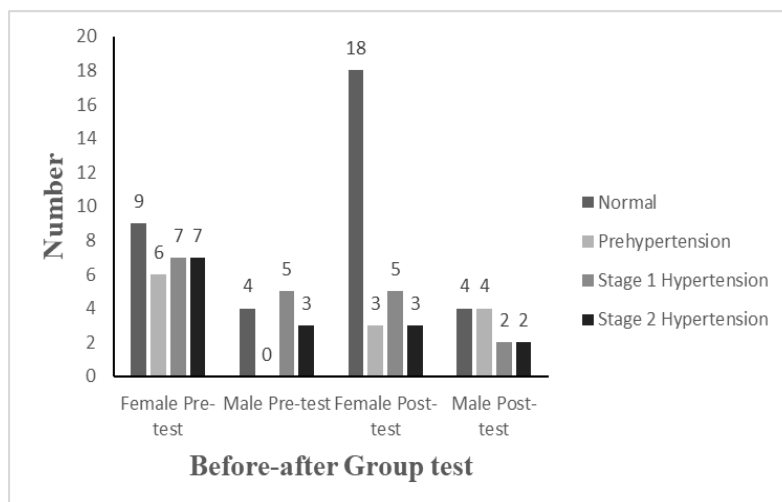


Figure 3. The Difference of pre-post and post-test result

4. Discussion

The present research investigates the relationship between physical activity and blood pressure within the community of Tumbang Tahai District, Palangka Raya, Indonesia. The findings of this study contribute valuable insights into the potential impact of physical activity on blood pressure levels in a specific geographical context.

Physical activity involves any body movement generated by skeletal muscles that requires energy expenditure. Regular physical activity can lead to various changes, such as strengthening the heart muscles, increasing its capacity, and ensuring strong and regular contractions. Additionally, it can enhance the elasticity of blood vessels through relaxation and vasodilation, reducing fat accumulation and improving the contraction of the blood vessel walls. Physical activity significantly affects blood pressure stability. Individuals who are inactive in physical activities tend to have a higher heart rate, causing the heart muscles to work harder with each contraction. The harder the heart muscles work to pump blood, the greater the pressure on the arterial walls, leading to peripheral resistance and an increase in blood pressure. Insufficient physical activity can also increase the risk of being overweight, which in turn raises the risk of hypertension (Harahap et al., 2018; Sihotang & Elon, 2020).

Furthermore, the findings open avenues for future research exploring the mechanisms through which physical activity exerts its effects on blood pressure. Molecular and physiological investigations could provide insights into the underlying pathways and help tailor interventions for optimal impact.

Practical implications of the study include the potential incorporation of community-based physical activity programs in public health initiatives aimed at preventing and managing hypertension in the Tumbang Tahai District. Collaborative efforts involving local authorities, healthcare professionals, and community leaders can enhance the effectiveness and sustainability of such interventions.

5. Conclusion

In conclusion, this research sheds light on the relationship between physical activity and blood pressure in the specific context of Tumbang Tahai District, Palangka Raya, Indonesia. The findings underscore the importance of considering cultural and regional factors in designing health interventions. This study contributes to the growing body of evidence supporting the role of physical activity in promoting cardiovascular health and encourages further exploration of tailored interventions for diverse populations.

Conflict of Interest

The authors declare no conflicts of interest for the results.

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