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Correlation of Physical Activty During The COVID-19 Pandemic to Blood Pressure of Nursing Students of STIKES Widyagama Husada Malang

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ABSTRACT

Introduction: The COVID-19 pandemic is limited to activities outside the home, focusing ononline activities with academic and practical learning, which can cause changes in bloodpressure, reducing physical activity for students. Lifestyle changes are a trigger fornon-communicable diseases (PTM), one of the factors that trigger changes in blood pressure.

Methods: Observational analytic research design with a cross-sectional approach. The sampling technique used Stratified Random Sampling with 66 nursing students in semesters 2, 4, 6, and 8. Physical activity was measured using the International PhysicalActivity Questionnaire (IPAQ), and blood pressure measurement using an aneroidsphygmomanometer. Data analysis used the Kruskall-Wallis test.

Results: The majority were female, 68.2%, and had an average age of 20.97. 66.7% had no family history of the disease, and as many as 77.3% had no previous medical history. 56.1% had a normal Body Mass Index (BMI), and the majority, 81.8%, had no smoking behavior. The majority, 54.5%, had moderate physical activity and normal blood pressure, with a mean of 111.08/79.89. The result of data analysis between physical activity and systolic blood pressure is p= 0.804, and for diastolic blood pressure, p= 0.961.

Conclusion: There is no significant correlation between physical activity during the COVID-19 pandemic and blood pressure in STIKES Widyagama Husada Malang nursing students.

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1. INTRODUCTION

COVID-19 started in Wuhan, China, and became a pandemic throughout the country in December 2019, with a very fast transmission of COVID-19 and causeda fairly high mortality rate (Hendsun *et al*., 2021). COVID-19 was first reported in Indonesia on March 2, 2020, based on data from the Committee for Handling COVID-19 and the National Economic Recovery with positive confirmed patients recorded from the first case until January 12, 2021, reaching 846,765 cases while the number of patients died was 302 cases (Larasati, 2021). This prompted the government to adopt a policy of implementing *Studying from Home and Working From Home* for all communities and students in Indonesia (Hendsun *et al*., 2021).

This policy is implemented at STIKES Widyagama Husada Malang with online lectures at

home *(Studying FromHome)*. This impacts the lower physical activity of students because of allactivities at home without walking and exercising. A lifestyle that *sedentary* does not pay attention to physical activity as something important to prevent various non-communicable diseases (Hendsun *etal*., 2021).

Physical activity is a lifestyle that affects human health, such as obesity, hypertension, diabetes, and metabolic syndrome, because decreased physical activity is associated with decreased insulin sensitivity (Hendsun *et al*., 2021). According to (Polero *et al*., 2021), inactive physical activity reduces maximum oxygen consumption, oxygen absorption capacity, and heart volume, thus affecting blood circulation and oxidative muscle function, which can increase blood pressure (Maulidia *et al*.,2019).

Riskesdas' 2013 data, the prevalence of high blood pressure is 26.4%. The number of hypertensive patients aged 15 years in East Java is 11,008,334, with the proportion of men at 48.83% and women at 51.17%. According to Riskesdas, in 2018, the population aged 18 years was 34.1%, with a death rate of 427,218 (Purba *et al*., 2019).

From the background description, the researcher is interested in examining the relationship between physical activity during the pandemic and changes in blood pressure in nursing students at STIKES Widyagama HusadaMalang.

2. METHOD

Observational analytic researchdesign with a cross-sectional approach with a sample of 66 students according to the inclusion criteria using *Stratified Random Sampling.* Physical activity instruments using the IPAQ instrument. Furthermore, IPAQ was measured using the *Metabolic Equivalent for Task* (MET) method. Total *Metabolic Equivalent for Task* (MET) results from each physical activity. Data analysis using Kruskal- Wallis.

We are collecting demographic and IPAQ data by interviewing and filling out questionnaires using a blood pressure sphygmomanometer and stethoscope.

3. RESULT

Table 1. shows that the respondent's age has a mean of 20.97. Most sexes are female, namely 45 people (68.2%). Most respondents did not have a family history of the disease at risk of hypertension or diabetes, as many as 44people (66.7%). The majority of blood pressure was normal, with an average of 111.08/79.89. Most of the respondents hada *Body Mass Index* (BMI) of 37 people (56.1%), while most of the respondents didnot have smoking behavior, as many as 54 people (81.8%). The majority of respondents have a moderate level of physical activity, as many as 36 people (54.5%). Table 2. Kruskal-Wallis. Significance shows the numbers 0.804 and 0.961 (p> 0.001). Because the significance value is 0.804 and 0.961, then sig. >0.001, therewas no difference between systolic and diastolic blood pressure in low, moderate, and heavy physical activity. This means there is no relationship between systolic and diastolic blood pressure in Light, moderate, and heavy physicalactivity.

4. DISCUSSION

The results of the study were of 66 respondents, 19 people (28.8%) with a light physical activity level, 36 people (54.5%) with a moderate level of physical activity, and 11 people (16.7%) with a heavy level of physical activity. The results of the research that has been done by researchers from 66 respondents, 19 people (28.8%) with light physical activitylevels, 36 people (54.5%) with moderate levels of physical activity, and 11 people (16.7%) with heavy physical activity levels. The results of the Kruskal-Wallis test between physical activity and systolic blood pressure and (p=0.961) for diastolic pressure can be concluded that there is nosignificant correlation between the two Variables.

The strength and physical energy of young adults are still optimal. It is possibleto do regular physical activity or sportsthat can provide benefits where exercise strengthens physical muscles, strengthens heart rate, breathing, reduces high blood pressure, protects against heart attacks, strokes, diabetes, cancer, and bone loss, reduces anxiety and depression, prolongs life(Susiani, 2018). At the age of young adults, the arterial walls have not experienced thickening because there is nocollagen accumulation in the muscle layer. There is no narrowing and stiffness of the blood vessel walls, so blood pressure remains stable with age causing physiological changes in the baroreceptor reflexes whose sensitivity decreases, and the kidneys' ability decreases infiltration. The glomerulus, decreased elasticity of blood vessels, causes an increase in peripheral vascular resistance (Nuraini, 2015).

Increasing age has the potential to increase blood pressure. This is because changes in arteries are wider and stiffer,resulting in reduced capacity and recoil of blood accommodated through blood vessels causing systolic blood pressure to increase, resulting in changes in neurohormonal renin-angiotensin-aldosterone, increased peripheral plasma concentrations (Nuraeni, 2019). The prevalence of hypertension in men and women is the same. However, women before menopause have the hormone estrogen, which increases levels of High-Density Lipoprotein to prevent atherosclerosis (Nuraini, 2015).

Table 1. Characteristics of Demographic Data of Respondentsat STIKES Widyagama (n=66)

Characteristics of Respondents	N (%)	Med (Min-Max)	Mean (sb)
Gender			
Female	45 (68.2%)		
Male	21 (31.8%)		
Age		21 (19-24)	20.97 (1.370)
Semester			
2	15 (22.7%)		
4	16 (24.2%)		
6	17 (25.8%)		
8	18 (27.3%)		
Past medical history			
No	51 (77.3%)		
Have	15 (22.7%)		
Family History			
No	44 (66.7%)		
Have	22 (33.3%)		
Blood Pressure			
Systolic blood pressure		110 (90-140)	111.08 (10.443)
Diastolic blood pressure		80 (65-90)	79.89 (6.424)
BMI (Body Mass Index)			
Normal (18.5-24.9)	37 (56.1%)		
Abnormal (<18.5 and >25-29.9)	29 (43.9%)		
Smoking			
Not smoking	54 (81.8%)		
Smoking	12 (18.2%)		
Physical			
Activity Light physical activity	19 (28.8%)		
Moderate physical activity	36 (54.5%)		
Heavy physical activity	11 (16.7%)		

Table 2. Characteristics of Categorical Demographic Data of Respondentsat STIKES Widyagama (n=66)

		N	Brinkman Index	Value sig.
Systolic blood pressure	Mild physical activity	19	110	0.804
	Moderate physical activity	36	110 (90-140)	
	Heavy physical activity	11	110 (90-135)	
Diastolic blood pressure	Light physical activity	19	80 (65-90)	0.961
	Physical activity moderate	36	80 (65-90)	
	Physical activity strenuous	11	80 (65-86)	

In line with research (Constantine & Haryono, 2022), a relationship between physical activity and blood pressure in students is not found. This is because changes in blood pressure are not significant in measuring physical activity at any time. The habit of physical activity has a greater

relationship with blood pressure but can be influenced by other factors such as stress and diet. In line with research by (Ashadi *et al*., 2020) assessing the activity patterns of sports andnon-sports faculty students before and after the COVID-19 pandemic showed that there was a significant change in the pattern of sports activity in respondents, restrictions on the use of infrastructure were one of the factors causing reduced physical activity during the COVID-19 pandemic.

In line with research (Liando et al., 2021) showing light physical activity categories where students now choose to use vehicles to facilitate daily activities,lecture activities are carried out online. In line with research (Meilina & Kusuma, 2022), most students do moderate physical activity (85%) and have a habit of frequent sedentary behavior (62.9%).

In line with research (Liando et al., 2021), respondents' physical activity level is classified in the moderate category, with as many as 54 people (47.8%). In the light category, as many as 33 people (29.2%) and at least 26 people (23 people). ,0%) weight category. Today's technological developments trigger a sedentary lifestyle, especially for students during the COVID-19 pandemic, by doing activities that do not require much energy where low physical activity increases the risk of 20-30% of non-communicable diseases compared topeople with sufficient physical activity for 150 minutes per week.

Data (Kemenkes RI, 2018) aged 17-64 years doing physical activity with moderate intensity at least 10 minutes aday, and it is recommended at least 30 minutes a day for moderate activity. Compared with the research results on nursing students at STIKESWidyagama Husada Malang, it can be saidto be good even though during the social restriction period, respondents still carried out activities with Light to moderate intensity, and some even did strenuous activities. In line with (Sidebottom et al., 2021) stated that quarantined students had a significantly decreased level of physical activity and *were sedentary* during the COVID-19 quarantine period. In addition, they were eating patterns changed by eating more at home, consuming alcohol, and decreasing fruit consumption.

In line with research (Bertrand et al., 2021) conducted on students at the Universities of Saskatchewan and Regina stated that during the COVID-19 pandemic,students' nutritional and calorie intake decreased, and alcohol intake increased, students' physical activity levels decreased, and *sedentary* increased significantly during COVID-19.During the COVID-19 pandemic, students were not physicallyactive enough to compensate for the increase in *sedentary*. The nursing theory linked to this research is Virginia Henderson's nursing model theory of 14 basic human needs, which defines nursing as helping sick and healthy individuals in carrying out activities that contribute to their health and healing, where the individual will be able to do it without help if he has strength, will, and knowledge required. Based on the theory of 14 basic human needs according to Virginia Henderson, this study focuses on the need for movement, where humans are free to move as desired and keep the body in a healthy environment.

At the age of young adults, the arterial walls have not experienced thickening because there is no accumulation of collagen in the muscle layer, and there is no narrowing and stiffness of the blood vessel walls, so blood pressure is still stable. In both male and female sex, the increasing age, the higher the risk of an increase in blood pressure. However, women are protected from cardiovascular disease before menopause, one of which is coronary heart disease.Young adult women or premenopausal women are protected by the hormone estrogen, which increases High-Density Lipoprotein (HDL) levels. High levels of HDL cholesterol are a protective factor in preventing the process of atherosclerosis. The protective effect of estrogen is thought to explain the presence of premenopausal female immunity.

The results of the analysis of this study are that there is no relationship between physical activity during the COVID-19 pandemic and blood pressurein college students. In this study, most respondents were female, and the respondent's age was also classified as premenopausal.The respondent's blood pressure is classified as normal. Normal blood pressure can occur due to the age of young adult respondents. The majority are female. The average blood pressure change is insignificant in differences in physical activity measurements because physical activity measurements are only carried out during a 7-day recall during the COVID-19 pandemic. Young adulthood is when physical strength and energy are optimal, so they often do physical activity or sports. The habit of continuous physical activity also has a greater relationship with blood pressure, althoughit is also not statistically significant. This study was conducted to prove the diagnosis of hypertension in students bymeasuring blood pressure twice, and theresults were averaged. Other factors may also influence these results, such as age,gender, family history of illness, previous medical history, obesity, and smoking.

5. CONCLUSION

There is no significant correlation between physical activity and blood pressure in nursing students STIKES Widyagama Husada Malang (p= 0.804) and (p= 0.961). The respondent's age is classified as a young adult, where physical strength and power are still optimal. However, increasing age and lifestyle changes during the COVID-19 pandemic may be one of the triggering factors for hypertension. This is expected to be able to add references for the community and students to be more obedient in carrying out physical activities to minimize increased blood pressure because physical activity during the pandemic can minimize the occurrence of increased blood pressure.

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