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The Relationship Between Sports and Stress Levels in Medical Students of The Class of 2022

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Abstract
Sports is all kinds of physical activity in the form of games and competitions against oneself, others, or natural elements. Sports play a crucial role in maintaining both physical and mental health of individuals. Lack of sports can increase stress levels, negatively impacting an individual's well-being. This research aims to explore the relationship between sports and stress levels among students of the Faculty of Medicine, Christian University of Indonesia (FK UKI) class of 2022. Through an analytical survey approach with a cross-sectional method, data were obtained from the Godin leisure-time exercise questionnaire and the PSS-10 questionnaire filled out by 116 respondents. The sample was taken based on a population of 164 students. The analysis results indicate a significant relationship between sports and stress levels among FK UKI class of 2022 students ($p < 0.001$; correlation coefficient -0.435). Most respondents were 19 years old and predominantly female. This study concludes that sports play a role in reducing stress levels among these students. The implications of this research reinforce the importance of integrating sports into mental health approaches in educational environments as effective interventions in addressing student stress. Thus, integrating sports into students' daily activities can positively contribute to improving their physical and mental well-being and strengthening the relationship between sports and mental health.

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Introduction

Stress is a person's emotional inability to handle threats faced by their mental, physical, emotional, and spiritual aspects, which can later have an impact on the physical and spiritual well-being of the individual. Normal stress is a natural response in the body that has a purpose, because stress increases an individual's ability to face difficulties or burdens of life. The demands and challenges of today's world, including workload, competition, and expectations, are pressure and stressors for everyone. When stressors become too strong, exceeding the individual's threshold, this can cause symptoms such as headaches, irritability, psychological tension, and difficulty sleeping (Nguyen-Michel et al., 2006). Perceived Stress Scale (PSS) is a measuring tool in the form of a questionnaire used to assess an individual's psychological stress level with measurements based on their own subjective perceptions. This questionnaire contains 10 questions and uses a Likert scale of 0-4. The method for calculating the total score of this questionnaire is by adding up the scores, with the note that in questionnaire questions number 4,5,7,8 the scores are reversed to 4 = 0, 3 = 1, 2 = 2, 1 = 3, and 0 = 4. The PSS score has a range between 0-40, with the higher score indicating the higher level of stress (Purnami & Sawitri, 2019). The interpretation of the final score of this questionnaire is: A score of 27-40 is categorized as severe stress. A score of 14-26 is categorized as moderate stress. A score of 0-13 is categorized as mild stress. According to Boram Lee, et al. in 2019 in their study where the reliability of the PSS-10 questionnaire was tested with a sample of 250 students at Woosong University, South Korea, the PSS-10 had good reliability with an α value <0.70. The study also supports the use of the PSS-10 in student samples (Lee & Jeong, 2019); (Adamson et al., 2020).

The results of the 2018 Basic Health Research (Riskesdas) showed that the prevalence of emotional mental disorders or stress in the Indonesian population aged over 15 years reached 9.8%, an increase of 3.8% from 2013. The province with the highest prevalence rate for emotional mental disorders or stress was Central Sulawesi, reaching 19.8%, while the lowest prevalence rate was recorded in Jambi, only 3.6% (Kemenkes RI, 2018) Sport is any physical activity in the form of a game and is carried out in the form of a match or against oneself, other people, or natural elements (Soedjatmiko, 2017). Regular exercise is important for maintaining health and body balance. Health and exercise are interrelated in life. To maintain health, exercise is an effective way. Various benefits can be obtained from exercise, such as increasing endurance, improving brain function, reducing stress, and lowering cholesterol levels. One of the simple sports options that can be done is brisk walking, gymnastics, swimming, running, and cycling. The impact of lack of exercise can cause uncontrolled weight gain, as well as having an impact on the body such as fatigue, obesity, and appetite disorders (Pane, 2015); (Kemenkes, 2023).

One of the measuring tools of sports activity is the Godin Leisure-Time Physical Activity questionnaire. This questionnaire allows the assessment of leisure time physical activity through an individual's report by calculating the individual's habits, in 1 week how many times they do heavy exercise (eg: running, jogging, hockey, soccer, squash, basketball, cross-country skiing, judo, roller skating, intense swimming, intense long-distance cycling), moderate exercise (eg: brisk walking, baseball, tennis, leisurely cycling, volleyball, badminton, leisurely swimming, alpine skiing, dancing) and light exercise (eg: yoga, archery, fishing, bowling, ring toss, golf, snowmobiling, leisurely walking).

The method for calculating the total score in this questionnaire is the total MET of heavy exercise (9 MET x frequency of heavy exercise per week) + total MET of moderate exercise (5 MET x frequency of moderate exercise per week) + total MET of light exercise (3 MET x frequency of light exercise per week). The interpretation of the final score of this questionnaire is: A score of 24 units and above is categorized as active. A score of 14-23 units is categorized as moderately active. A score of less than 14 units is categorized as less active. Based on research conducted by Amireault S in 2015, the validity of the Godin leisure-time exercise Questionnaire was tested using the Pearson analysis method for each question item on the overall score; the results showed that all three items on the Godin leisure-time exercise Questionnaire were considered valid. Item 1 is in the heavy exercise category with a value of 0.832, indicating strong validity; item 2 is in the Moderate Exercise category with a value of 0.830, indicating strong validity; and item 3 is in the light exercise category with a value of 0.840, indicating strong validity (Godin, 2011); (Amireault et al., 2015).

Exercise has been shown to have significant positive effects on stress levels and mental health. This connection between exercise and mental health is mediated through various brain regions such as the limbic system, amygdala, and hippocampus. Regular exercise has been shown to reduce symptoms of mental disorders such as schizophrenia, and even short periods of moderate-intensity physical activity can provide health benefits, including reduced stress, improved mood, and improved cardiovascular health. Integrating exercise into mental health care may be a useful intervention (Sharma et al., 2006). Based on this background, the researcher wants to know whether there is a relationship between sports and stress levels in FK UKI students, class of 2022. This research was conducted on FK UKI students, class of 2022 because some of them participated and were active in the Student Activity Unit (UKM) for sports.

Method

Research Design: This type of research is analytical survey research with a cross-sectional design. The purpose of the study is to analyze the relationship between exercise and stress levels in medical students of the 2022 intake. Place and Time of Research: This research was conducted at the Faculty of Medicine, Universitas Kristen Indonesia Cawang. The research was conducted on March 1, 2024. The population is all research objects. The population in this study was all UKI FK students of the 2022 intake, totaling 164 people. The sample was taken using a simple random sampling technique, with the number determined using the Slovin formula, totaling 116 respondents.

Result and Discussion

1. Result

The study of the relationship between exercise and stress levels in FK UKI students, Class of 2022 was conducted in February 2024 - March 2024. The Godin Leisure-Time Exercise questionnaire and the PSS-10 questionnaire filled out by respondents served as data sources for the study. The population in this study was a total of 164 FK UKI students, Class of 2022. The respondents in this study numbered 116 people. Furthermore, the researcher will process data on all the information collected using univariate and bivariate analysis methods.

Distribution Data of Respondents' Demographic Characteristics

Table 1
Distribution of Respondents' Demographic Characteristics (n= 116)

Respondent Character		Frequency	Percentage
Age			
	18 years	6	5.17
	19 years	91	78.45
	20 years	18	15.52
	21 years	1	0.86
Gender			
	Male	33	28.45
	Female	83	71.55

Table 1 above shows that of the 116 respondents in the study, most respondents' age was 19 years, which was 91 respondents (78.45%), 18 years old were 6 respondents (5.17%), 20 years old were 18 respondents (15.52%), 21 years old were 1 respondent (0.86%). From this number, the data obtained was that 33 respondents (28.45%) were male, while 83 respondents (71.55%) were female.

Sports Overview (Godin Leisure-Time Exercise Score) in College Students

Table 2
Distribution of Godin Leisure-Time Exercise in College Students (n= 116)

Sports (Godin Leisure-Time Exercise Score) in College Students	Frequency	Percentage
Active	58	50
Quite Active	54	46.55
Less Active	4	3.45

Table 2. above shows that out of 116 respondents, the number of active respondents was 58 respondents (50%), the number of active respondents was 54 respondents (46.55%), and the number of less active respondents was 4 respondents (3.45%).

Description of Stress Levels in Students

Table 3
Distribution of Stress Levels in Students (n= 116)

Stress Levels in Students	Frequency	Percentage
Mild Stress	42	36.21
Moderate Stress	74	63.79
Heavy Stress	0	0

Table 3. above shows that out of 116 respondents, the number of respondents with mild stress was 42 respondents (36.21%), the number of respondents with moderate stress was 74 respondents (63.79%), and there were no respondents with severe stress or 0 respondents (0%).

Analysis of the Relationship between Sports (Godin Leisure-Time Exercise Score) and Stress Levels in Students

Table 4
Analysis of the Relationship between Sports and Stress Levels in Students

			Exercise (Godin Leisure-Time Exercise score)	**Stress Level**
Spearman's rho	**Exercise (Godin Leisure-Time Exercise score)**	**Correlation Coefficient**	1.000	-.435**
		Sig. (2-tailed)	.	<0.001
		N	116	116
	Stress Level	**Correlation Coefficient**	-.435**	1.000
		Sig. (2-tailed)	<0.001	.
		N	116	116

Table 4 above states that there is a sig. value (2-tailed) is smaller than 0.001 which can be concluded that there is a significant relationship between Exercise (Godin Leisure-Time Exercise Score) and Stress Level. While the Correlation Coefficient value is -0.435. So, from this value it is concluded that there is a negative relationship between Exercise and Stress Level.

2. Discussion

Demographic Characteristics Distribution Data

Of the 116 respondents, the majority were 19 years old, which was 78.45%, and the smallest was 21 years old, which was 0.86%. This result is different from the research in 2015 conducted by Bao et al, et al. with 166 respondents who were students of the Faculty of Medicine, Nusa Cendana, where the majority were respondents aged 18 years, which was 74.7%. The factor that caused this study to have a different distribution of respondent ages was due to differences in the time of giving the questionnaire. In that study, the questionnaire was given when the Faculty of Medicine students were in their first academic year, while in this study the students were already in their second academic year (Bao et al., 2022)

In this research, women were the majority of those studied, reaching 71.5%, while men were 28.45%. This result is in line with the 2021 research conducted by Ummaiya F, et al., where in their research they stated that out of a total of 80 respondents who were students of the Faculty of Medicine, Udayana University, class of 2019, the majority of 52.5% were women, while men were 47.5% (Ummaiya et al., 2022). The same thing was also said by Fadillah A, et al. in 2024, where in their research out of a total of 136 respondents who were students of the Faculty of Medicine, class of 2020-2023 at the Muhammadiyah University of Surakarta, most respondents were women, 69.9%, while men were 30.1% (Fadillah & Nursanto, 2024). This result is also supported by the British Medical Journal, which in its findings in 2018 stated that in England for 25 years, women entering medical school have always exceeded men (MEN, 2018).

Sports Overview (Godin Leisure-Time Exercise Score) in College Students

In this study, most of the total respondents, as many as 50% were classified as active, respondents who were quite active were 46.55%, and respondents with the smallest number were classified as less active as many as 3.45%. These results are in accordance with a study in 2020 conducted by Kaas ET, et al. at Akdeniz University, Turkey. In the study, of the 500 respondents who were students, most respondents, as many as 44% were classified as active, 24.8% were classified as moderately active, and 31.2% were classified as less active (Kaas et al., 2020). However, this contrasts with the 2023 research by Setiawan Y, et al. who in their research at Tarumanegara University, where out of 93 respondents, the majority, as many as 66.7% were classified as less active, while 23.7% were classified as moderately active and only 9.7% were classified as active (Setiawan & Lontoh, 2023). One of the reasons why this could happen according to Putri, 2022, is because medical students have a full study schedule. This causes students to have little time for regular exercise (PUTRI, 2022)

Overview of Stress Levels in Students

The stress levels of respondents can be seen based on the scores obtained from the PSS-10 questionnaire that they have answered. The PSS-10 scores obtained after being calculated are then categorized into mild stress levels, moderate stress levels or severe stress levels. Based on the data obtained by the author, students with mild stress levels were 36.21%, students with moderate stress levels were 63.79%, and there were no students with severe stress levels or 0%. This finding is in accordance with the results of a study conducted in 2022 by Az-Zahra AP, et al at the Islamic University of Bandung where out of a total of 135 FK students, the majority or 80% experienced moderate stress (Azzahra et al., 2023). This finding is also in line with the results of a 2022 study conducted by Limanan D, et al where out of a total of 198 respondents who were FK students, 77.8% experienced moderate stress (Limanan & Olivia, 2022). According to Ye W, et al in a study in 2021, medical students suffer more stress when compared to non-medical students (Ye et al., 2020). Quek TT, et al. in 2019 also said that medical students felt more academic pressure and the risk of developing mental illness was also greater (Tian-Ci Quek et al., 2019)

Analysis of the Relationship between Exercise (Godin Leisure-Time Exercise Score) and Stress Levels in Students

Statistical analysis using Spearman's rho to evaluate the relationship between exercise and stress levels showed a sig. (2-tailed) value of <0.001 indicating a significant correlation between the two variables. Meanwhile, for the Correlation Coefficient value of -0.435, it can be concluded that there is a sufficient and negative relationship between Exercise and Stress Levels. Research conducted by Chandra II, et al. in 2022 with a sample of 58 students showed the same results where the statistical test found that students who did not exercise regularly had a 3.72 times greater risk of experiencing stress compared to students who exercise regularly. In other words, irregular exercise habits are a risk factor for moderate/severe stress events in students of the Faculty of Medicine, Tarumanegara University, Class of 2020-2021. Schultchen D, et al. in their study on 51 students in 2019 also found that high stress was associated with low levels of exercise habits. This is also supported by a narrative review study in 2021 conducted by Nopela S where the conclusion drawn by the researcher is that exercise influences reducing stress levels in adolescents (Schultchen et al., 2019)

Sharon-David H, et al in 2017 said that reducing stress levels due to exercise not only occurs in students, but also in athletes, the elderly, and even in veterans who suffer from PTSD (Sharon-David H, et al, 2017). This is physiologically supported by Arent, S. M, 2020, that improved mood due to exercise is due to increased blood circulation to the brain due to its effect on the hypothalamic-pituitary-adrenal (HPA) axis which regulates physiological reactivity to stress (Arent et al., 2020). Lemly D.C also said that this physiological effect is mediated by communication of the HPA axis with several brain regions, including the limbic system, which controls motivation and mood; the amygdala, which produces fear in response to stress; and the hippocampus, which plays an important role in memory formation as well as in mood and motivation (Lemly et al., 2022). According to Smith, et al study, hormonally, an increase in endorphins also plays a role in mood changes during exercise (Smith & Lynch, 2023).

Conclusion

In relation to the data collected by the author, the author can conclude as follows: 1)The demographic description is mostly at the age of 19 years as many as 91 respondents (78.45%), female gender is 83 respondents (71.55%) more than male which is 33 respondents (28.45%); 2) The description of sports habits in FK UKI students class of 2022 is the most active, as many as 58 respondents (50%); 3) The description of stress levels in FK UKI students class of 2022 is the most moderate stress, as many as 74 respondents (63.79%); 4)There is a significant correlation between the exercise variable and stress levels as seen from the Sig. value. <0.001 and the correlation coefficient -0.435, so that the correlation between the two variables is sufficient and has a negative pattern.

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