International Journal of Human Movement and Sports Sciences 11(1): 224-232, 2023 http://www.hrpub.org
DOI: 10.13189/saj.2023.110126

Relationship between Physical Activity, Stress and Sleep Quality and Emotional Intelligence

Endang Sepdanius[1,*], Suci Kristian Harefa[1], Pudia M Indika[1], Hastria Effendi[1], Muhamad Sazeli Rifki[1], Rini Afriani[2]

[1]Sport Science Study Program, Faculty of Sports Science, Universitas Negeri Padang, West Sumatra, Indonesia
[2]History Study Program, Faculty of Social Sciences, Universitas Negeri Padang, West Sumatra, Indonesia

Received October 17, 2022; Revised January 4, 2023; Accepted January 28, 2023

Cite This Paper in the Following Citation Styles

(a): *[1] Endang Sepdanius, Suci Kristian Harefa, Pudia M Indika, Hastria Effendi, Muhamad Sazeli Rifki, Rini Afriani , "Relationship between Physical Activity, Stress and Sleep Quality and Emotional Intelligence," International Journal of Human Movement and Sports Sciences, Vol. 11, No. 1, pp. 224 - 232, 2023. DOI: 10.13189/saj.2023.110126.*

(b): *Endang Sepdanius, Suci Kristian Harefa, Pudia M Indika, Hastria Effendi, Muhamad Sazeli Rifki, Rini Afriani (2023). Relationship between Physical Activity, Stress and Sleep Quality and Emotional Intelligence. International Journal of Human Movement and Sports Sciences, 11(1), 224 - 232. DOI: 10.13189/saj.2023.110126.*

Abstract This research aims to determine the correlation between physical activity, stress and sleep quality with Emotional Intelligence (EI). This type of research is quantitative correlational research. The population in this research were students at the Faculty of Sports Science, Universitas Negeri Padang. 100 students participated in this research agreed to be the sample. The data in this research were obtained by the instruments distributed in the form of a questionnaire. The variables in this research were physical activity using the IPAQ questionnaire instrument, stress using the DASS questionnaire, sleep quality using the PSQI questionnaire instrument and EI using the WLEIS questionnaire instrument. The analytical technique used was inferential statistical analysis with the Spearman rank test. The results of hypothesis testing showed that, (1) There was a significant positive correlation between physical activity and EI (0.029 < 0.05). (2) There was a significant negative correlation between stress and EI (0.008 <0.05). (3) There was a significant negative correlation between sleep quality and EI (0.001 < 0.05). (4) There was a significant negative correlation between physical activity and stress (0.041 < 0.05). (5) There was a significant positive correlation between stress and sleep quality (0.000 < 0.05). (6) There was no significant negative correlation between physical activity and sleep quality (0.309 > 0.05). This research showed that there was an interrelated correlation between physical activity, stress and sleep quality on EI. However, there was no significant correlation between physical activity and sleep quality. Therefore, it is recommended to maintain the quality of physical activity in order to avoid stress so as to get good sleep quality and maintain EI.

Keywords Physical Activity, Stress, Sleep Quality, Emotional Intelligence

1. Introduction

In (Law No. 36 2009 law on health, 2009) Chapter I Article 1, which reads “Health is a healthy state, both physically, mentally, spiritually and socially that allows everyone to live socially and economically productive” [1]. From this understanding, it can be concluded that health is something that is very important for everyone to have. With good health, everyone can get high productivity.

Early adulthood is the age to find identity and develop a career to achieve a success. In achieving this, there are physical and mental factors which determine a person’s success [2]. This factor is an EI related to emotions or behavior.

EI is a person's ability to defend himself so as not to experience frustration and be able to control impulses so as not to exaggerate feelings of pleasure, be able to regulate moods and keep stress from crippling the ability to think and empathize [3]. EI is a person's ability and skills to

identify and manage emotions within oneself, towards other people and groups [4]. EI has five components, namely the ability to understand one's own emotions, manage emotions, motivate oneself, know the emotions of others and build correlations with others.

Several previous studies suggest that EI is supported by several factors such as physical activity, sleep quality, and stress [5]. Regular physical activity can improve a person's psychology by reducing stress, anxiety and depression [6]. Then it was added that the level of a person's emotional intelligence was related to the type of sport they were involved in [7].

Students are a special population who are going through a time of great challenges, risks and transitions to social development. In college life, students will meet various circumstances and situations every day. From the various situations they faced, students need to have a high level of EI, so that students can adapt to their environment, be able to control themselves, can control emotions, and understand other people's emotions. Thus, the students can get happiness and success in their life. To find out the correlation between physical activity, stress and sleep quality on EI, the research needs to be done.

2. Research Methods

The kind of this research was correlational quantitative. Participants in this research were the students of the Faculty of Sports Science, Universitas Negeri Padang. Porpusive sampling technique was used to attract 100 participants. The average age of participant was 19 years old, consisting of 67 male participants and 33 female participants.

The data collection technique was a questionnaire. IPAQ is a questionnaire with a physical activity measurement scale based on the MET (Metabolic Equivalent) value that is used to determine the degree of physical activity. IPAQ has a moderate level of validity (r = 0.48).

The self-assessment scale used to measure a person's negative emotional for stress is DASS (Depression Anxiety Stress Scales) [8]. Because in this research, the stress level was sought, so the questionnaire in this research that was measured was a stress scale consisting of 14 questions. Table 1 shows that there are four rating scales, starting from never with a value of 0 to always with a value of 3. The following Table 1 is displayed.

Table 1. Respondent's Answer Category

Category	Score
Never	0
Sometimes	1
Often	2
Always	3

The 14 questions have been declared valid and reliable with a Cronbach Alpha coefficient of 0.880.

The questionnaire for quality of sleep is the PSQI (Pittsburgh Sleep Quality Index) developed by Busyee, Reynolds, Monk, et al. where the reliability value is (crombach's) 0.83. The PSQI questionnaire consists of 19 questions, each of which consists of 7 components of subjective sleep quality, sleep latency, sleep duration, sleep disturbances, sleep efficiency, use of sleeping pills and daytime sleep dysfunction (Table 2). From the results of the respondents' answers to the 19 questions, they were added up according to the criteria for the provisions contained in the PSQI questionnaire.

Table 2. Distribution of Sleep Quality Items

No	Dimension	Item number
1	Subjective sleep quality	6
2	Sleep latency	2, 5a
3	Sleep duration	4
4	Habits of sleep efficiency	4, 3, 1
5	Sleep disturbance	5b, 5c, 5d, 5e, 5f, 5g, 5h, 5i, 5h
6	Use of sleeping pills	7
7	Dysfunction during the day	8, 9

The scores of the seven components are then added up to become the overall of score with a value range of 0 – 21. A Global score 5 indicates good sleep quality and scores > 5 are considered to have poor sleep quality. The validity of the PSQI questionnaire has been tested for r count (0.410-0.831) > r table (0.361) so that this questionnaire is suitable to be used to measure sleep quality.

The questionnaire for EI is WLES (The Wong Law Emotional Intelligence Scale), a questionnaire developed by Wong An Law in 2002 consisting of 16 questions [9]. This questionnaire has a Cronbach alpha coefficient of 0.87, meaning that this questionnaire is valid and reliable. Table 3 shows the 5 rating scales of the WLEIS.

Table 3. Instrument Answer Indicator (WLEIS)

No.	Alternative Answer	Score
1.	Always	5
2.	Often	4
3.	Sometimes	3
4.	Seldom	2
5.	Never	1

The analysis used for this study was the Spearman Rank (Rho) correlation test using the SPSS version 26 application.

3. Research Result

3.1. Description

Table 4 shows the descriptive data of the four variables. It can be seen from the data that the variance of the physical activity variable is 0.212, Stress is 0.313, Sleep quality is 0.373, and EL is 0.333.

3.2. Hypothesis Testing

Based on the 6 research hypotheses, Figure 1 shows the correlation analysis framework of physical activity, stress and sleep quality on EI.

Table 4. Statistical Test Results

Statistics					
		Physical Activity	Stress	Sleep Quality	EI
N	Valid	100	100	100	100
	Missing	0	0	0	0
Mean		2.0100	1.9900	1.9700	2.0100
Median		2.0000	2.0000	2.0000	2.0000
Mode		2.00	2.00	2.00	2.00
Std. Deviation		.46046	.55949	.61060	.57726
Variance		.212	.313	.373	.333
Range		2.00	2.00	2.00	2.00
Minimum		1.00	1.00	1.00	1.00
Maximum		3.00	3.00	3.00	3.00
Sum		201.00	199.00	197.00	201.00

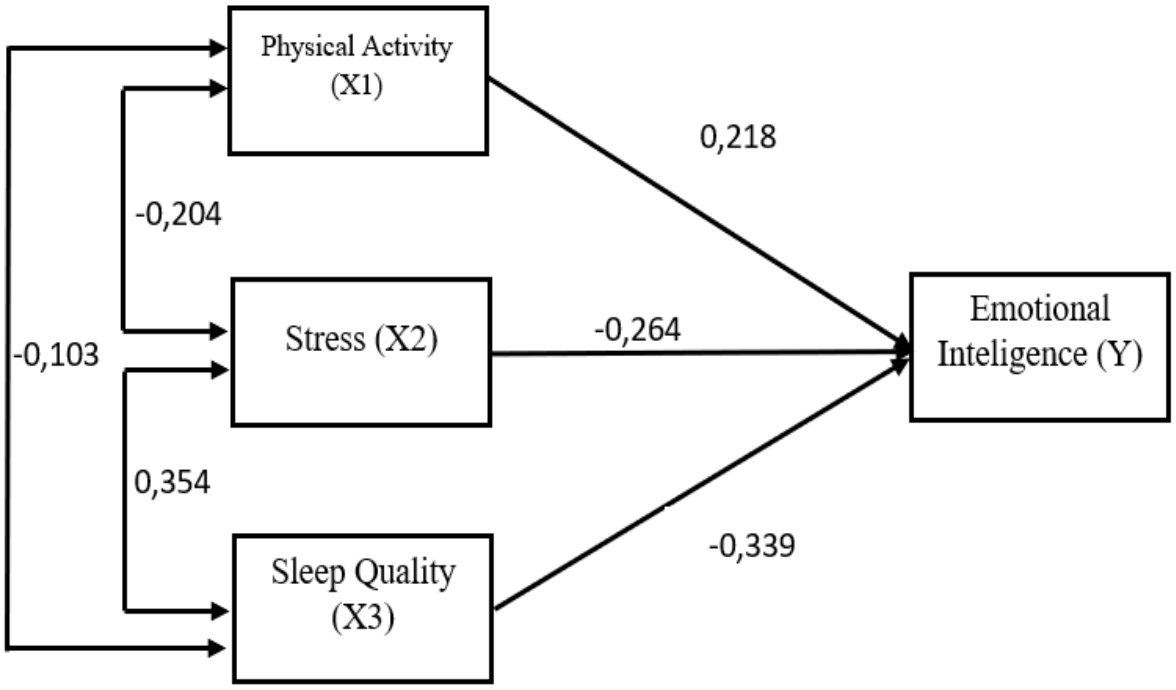

Figure 1. Analysis of the Correlation of Physical Activity, Stress and Sleep Quality with EI

3.2.1. Correlation between Physical Activity and EI

Based on the results of the analysis in Table 5, it was found that the significant correlation value was (0.029 < 0.05) which means that Ha was accepted and Ho was rejected, while the correlation coefficient value was 0.218 (positive direction). So, there was a significant positive correlation between physical activity and EI.

Table 5. Results of Analysis of the Correlation between Physical Activity and EI

Correlations				
			Physical Activity	EI
Spearman's rho	Physical Activity	Correlation Coefficient	1,000	.218*
		Sig. (2-tailed)	.	.029
		N	100	100
	EI	Correlation Coefficient	.218*	1,000
		Sig. (2-tailed)	.029	.
		N	100	100

3.2.2. Correlation between Stress and EI

Based on the results of the analysis in Table 6, it was found that the correlation significance value was (0.09 <0.05), which means Ha was accepted and Ho is rejected, while the correlation coefficient was -0.264 (negative direction). So, there was a significant negative correlation between stress and EI.

Table 6. Results of Analysis of the Correlation between Stress and EI

Correlations				
			Stress	EI
Spearman's rho	Stress	Correlation Coefficient	1,000	-.264**
		Sig. (2-tailed)	.	.008
		N	100	100
	EI	Correlation Coefficient	-.264**	1,000
		Sig. (2-tailed)	.008	.
		N	100	100

3.2.3. Correlation between Sleep Quality and EI

Based on the results of the analysis in Table 7, it was obtained that the correlation significance value was (0.01 < 0.05), which means Ha was accepted and Ho was rejected, while the correlation coefficient was -0.339 (negative direction). So, there was a significant negative correlation between sleep quality and EI.

Table 7. Results of Analysis of the Correlation between Sleep Quality and EI

Correlations				
			Sleep Quality	EI
Spearman's rho	Sleep Quality	Correlation Coefficient	1,000	-.339**
		Sig. (2-tailed)	.	.001
		N	100	100
	EI	Correlation Coefficient	-.339**	1,000
		Sig. (2-tailed)	.001	.
		N	100	100

3.2.4. Correlation between Physical Activity and Stress

Based on the results of the correlation analysis in Table 8, it was known that the significance value or Sig. (2-tailed) of 0.041. In accordance with the basis of decision making, if the significance value is < 0.05, then it is correlated or Ho is rejected and if the significance value is > 0.05, then it is not correlated or Ho is accepted. Because the value of Sig. (2-tailed) 0.041 < 0.05, then Ho was rejected and H1 was accepted.

Table 8. The Results of the Analysis of the Correlation between Physical Activity and Stress

Correlations				
			Physical Activity	Stress
Spearman's Rho	Physical Activity	Correlation Coefficient	1,000	-.204*
		Sig. (2-Tailed)	.	.041
		N	100	100
	Stress	Correlation Coefficient	-.204*	1,000
		Sig. (2-Tailed)	.041	.
		N	100	100

The correlation coefficient value between physical activity and stress was -0.204, based on the interpretation value basis, the correlation coefficient value was in the range of "0.20 - 0.399" which means the level of correlation between physical activity and stress was included in the low level of correlation.

The close correlation between physical activity and the coefficient of -0.204 was obtained. This value means that the correlation between physical activity and stress was low. The direction of the correlation between the two variables was negative or not in the same direction. That

was, the heavier the level of physical activity, the lower the stress level.

3.2.5. Correlation between Stress and Sleep Quality

Based on the results of the correlation analysis in Table 9, it was known that the significance value or Sig. (2-tailed) of 0.000. In accordance with the basis of decision making, if the significance value is < 0.05, then it is correlated or Ho is rejected and if the significance value is > 0.05, then it is not correlated or Ho is accepted. Because the value of Sig. (2-tailed) 0.000 < 0.05, then Ho was rejected and H1 was accepted.

Table 9. Results of Analysis of the Correlation between Stress and Sleep Quality

Correlations				
			Stress	Sleep Quality
Spearman's rho	Stress	Correlation Coefficient	1,000	.354**
		Sig. (2-tailed)	.	.000
		N	100	100
	Sleep Quality	Correlation Coefficient	.354**	1,000
		Sig. (2-tailed)	.000	.
		N	100	100

The correlation coefficient value between stress and sleep quality was 0.354, based on the interpretation value, the correlation coefficient value was in the range of "0.20 - 0.399" which means that the correlation between stress and sleep quality was low.

The close correlation between stress and sleep quality obtained a coefficient of 0.354. This value means that the correlation between stress and sleep quality was low. The direction of the correlation between the two variables was positive or unidirectional. That was, the lighter the stress level, the better the level of sleep quality. Thus, it was concluded that there was a significant positive correlation between stress and sleep quality.

3.2.6. Correlation between Physical Activity and Sleep Quality

Based on the results of the correlation analysis in Table 10, it is known that the value or Sig. (2-tailed) of 0.309. In accordance with the basis of decision making, if the significance value is < 0.05, then it is correlated or Ho is rejected and if the significance value is > 0.05, then it is not correlated or Ho is accepted. Because the value of Sig. (2-tailed) 0.309 > 0.05, then H1 was rejected and H0 was accepted. This meant that there was no significant correlation.

The correlation coefficient value between physical activity and sleep quality was -0.103, based on the interpretation value, the correlation coefficient value is in the range of "0.000 - 0.199" which means that the level of correlation between physical activity and sleep quality was very low.

Table 10. Results of Analysis of the Correlation between Physical activity and Sleep Quality

Correlations				
			Physical Activity	Sleep Quality
Spearman's rho	Physical Activity	Correlation Coefficient	1,000	-.103
		Sig. (2-tailed)	.	.309
		N	100	100
	Sleep Quality	Correlation Coefficient	-.103	1,000
		Sig. (2-tailed)	.309	.
		N	100	100

The direction of the correlation between the two variables was negative or not in the same direction. That was, the better the level of physical activity, the better the level of sleep quality. Therefore, based on the results, it was concluded that there was no significant correlation between physical activity and sleep quality.

4. Discussion

4.1. Correlation between Physical Activity and EI

Based on the results of the correlation analysis between physical activity and the EI of the students of the Faculty of Sports Science, Universitas Negeri Padang, the correlation significance value (0.029 < 0.05) was obtained and the correlation coefficient value was 0.218. Thus, it can be concluded that there was a significant positive correlation between physical activity and the EI of the students of the Faculty of Sports Science, Universitas Negeri Padang. This means that the better the level of physical activity, the better the EI you have.

Physical activity is any type of activity that involves movement in the body, and causes an increase in calorie needs. Physical activity that is carried out regularly and continuously in accordance with the recommended intensity and duration according to age and ability can improve the degree of physical or psychological health [10]. On the other hand, good emotional and physical activity are able to survive in unfavorable conditions [11].

Regular physical activity can improve a person's psychology by reducing stress, anxiety and depression [12]. Physical activity can control negative mental, emotional and spiritual conditions that can interfere with daily activities [13]. In addition, the better the implementation of physical activity, the better the ability of one's body [14]

[15]. Students who often do physical activity are better able to adapt to their environment, are able to understand themselves, are able to recognize their emotions, are able to motivate themselves and are able to recognize the emotions of others and this is a form of high EI ability. It is emphasized that demographics have a correlation with emotional abilities [16].

4.2. Correlation between Stress and EI

Based on the results of the correlation analysis between stress and EI students of the Faculty of Sports Science, Universitas Negeri Padang, the correlation significance value was (0.008 < 0.05) and the correlation coefficient value was -0.264. Thus, it can be concluded that there is a significant negative correlation between stress and EI. This means that the lighter the stress, the higher the level of EI you have.

Based on this, it can be seen that someone who has a mild level of stress has a good level of EI. Stress is a disorder in the body and mind caused by changes and demands of life, which are influenced by the environment and the appearance of individuals in the environment [17]. Stress is a person's emotional response in the face of everything that causes pressure on the mind, which is then processed to be overcome. However, with a good level of EI, stress can be managed, so that it can be positive and constructive, which in turn can bring up strong motivation in oneself and be able to control oneself to solve any problems and challenges faced. In addition, the environment also affects emotions and attention [18] [19].

4.3. Correlation between Sleep Quality and EI

Based on the results of the correlation analysis between sleep quality and EI students of the Faculty of Sports Science, Universitas Negeri Padang, the correlation significance value was (0.001 < 0.05) and the correlation coefficient value was -0.339. Thus, it can be concluded that there is a significant negative correlation between sleep quality and EI students of the Faculty of Sports Science, Universitas Negeri Padang. This means that the better the quality of sleep, the higher the level of EI you have.

Sleep quality is the individual's ability to meet the needs of sleep in accordance with the maximum sleep needs [20]. Individuals who have poor sleep quality will have negative impacts on the body, including being susceptible to disease, often feeling tired, unfocused and often sleepy. Lack of sleep can interfere with a person's emotional health resulting in anxiety, stress and reduced performance [21]. In addition, the importance of quality sleep as a necessary resource for professionals to manage stressful situations and moods [19].

A person is required to have good quality sleep, so that an individual can have a high EI. Good quality sleep can be done by always maintaining a sleep pattern and having an age-appropriate amount of sleep. Students who have good sleep quality tend to be more energetic and enthusiastic about carrying out daily activities. And this will make students more time to do activities well, be able to communicate well with others, be able to pursue targets and complete assignments on time.

Sleep quality is influenced by sleep patterns and emotional stress as factors that affect student sleep quality [22]. From some of these influences, among students according to the results on the data received, it was found that most students experienced poor sleep quality due to the influence of sleep patterns due to the environment including roommates, neighbors, light bulbs and activities like playing games that cause noises consequently they can not sleep.

4.4. Correlation between Physical Activity and Stress

Physical activity is all activities related to movement. Physical activity has many benefits for the body both physically and spiritually. Besides being useful for physical fitness, physical activity has benefits for reducing stress.

Environmental influences and changes in individual behavior in dealing with the pressures of life resulting in disturbances to the body and mind is called stress. Stress that cannot be managed properly can have a negative impact on the body health.

Based on the results of the research, it was found that, there was a significant negative correlation between physical activity and stress for students of the Faculty of Sports Science, Universitas Negeri Padang. The significance value obtained was 0.041 (<0.05), and the correlation coefficient was -0.204 with the direction of the correlation being negative. A negative correlation means that the better the level of physical activity, the lower the stress level.

In line with research conducted by Alfarisi found that there is a correlation between exercise and stress tolerance in male students [23]. By doing sports or physical activity the body will reduce stress hormones, these hormones are the hormones epinephrine and cortisol. When the body does sports activities, the body will produce beta-endorphins which have the effect of improving mood. Optimal physical activity affects quality of life [24].

Based on this explanation, the better the physical activity carried out by students, the lighter the stress experienced. This is because by doing regular and structured physical activity. The body will be able to obtain physical fitness. Physical fitness is related to the state of stress experienced by a student. The body will get more accustomed to dealing with stress. Then with good stress management, the student makes the stress experiences a strong source of motivation to fight. Positive stress then it is recorded as a positive experience for the body. So that by doing physical activity the body can be more relaxed and avoids stress. The more often you do physical activity, the more your body gets used to dealing with stress.

4.5. Correlation between Stress and Sleep Quality

Excessive stress can cause adverse effects on physical and psychosocial health for a student. Stress affects the hormones epinephrine, norepinephrine and cortisol in the human nervous system which results in disruption of the NREM and REM sleep cycles so that people cannot sleep well at night [25]. Stress that occurs due to the demands of life and the pressure experienced by a person will result in disturbed body homeostasis resulting in body functions not working properly. Stress is something that can be lived in everyday life, and stress can arise from oneself, and also from the environment. Based on the results obtained, it was found that the stress level of the students of the sports science faculty was in the moderate stress category, and also the sleep quality level of the sports science faculty students was in the moderate sleep quality category. In the research explained that sleep quality is significantly related to the level of smartphone dependence [26].

Based on the results of the research conducted, it was found that there was a positive correlation between stress and sleep quality for the students of the Faculty of Sports Science, Universitas Negeri Padang. The significance value obtained was 0.000 (<0.05), and the correlation coefficient value is -0.354 with the direction of the correlation being positive. A positive correlation means that the lighter the student's stress, the better the sleep quality.

Other studies have also found that there was a correlation between stress levels and final student sleep quality [20]. Stress is one of the factors that causes poor sleep quality, this happens as a result of stress problems that arise where when a person is stressed it is too hard to think and force his body to be able to solve the problem, he is facing it is difficult to fall asleep.

4.6. Correlation between Physical Activity and Sleep Quality

Physical activity is any type of activity related to motion. Physical activity is divided into three categories, namely light category physical activity, moderate category physical activity and heavy category physical activity. The heavier the level of physical activity carried out, the more energy expended. Based on this, the body will experience fatigue, so the body needs sufficient rest to recover energy. Exercise and fatigue can affect the quality and quantity of a person's sleep because fatigue due to high activity can require more sleep to maintain a balance of energy that has been expended [27].

In this research, no significant correlation was found between physical activity and sleep quality for students of the Faculty of Sports Science, Universitas Negeri Padang. Because the significance value obtained was 0.309 (> 0.05), and the correlation coefficient was -0.103 with the direction of the correlation being negative. The negative correlation was that the better the physical activity, the better the sleep quality.

This was different from the results of research conducted by Baso which explains that there was a correlation between physical activity and sleep quality [27]. Doing physical activity can improve a person's sleep quality [28]. Heavy physical activity can make a person tired and feel tired, so that an individual wants to rest or sleep. There is an interactive correlation between physical activity and screen time on sleep quality. The findings suggest that low physical activity and high screen time are independently associated with poor sleep quality, as well as physiological, psychological, and social outcomes [29].

From the results, it was found that the level of physical activity and the level of sleep quality possessed by students of the Faculty of Sports Science, Universitas Negeri Padang were in the category of moderate physical activity and moderate sleep quality. This was one of the possible causes of the absence of a correlation between physical activity and sleep quality for the students of the Faculty of Sports Science, Universitas Negeri Padang.

Expected sleep quality is good sleep quality. Good sleep quality or quality can provide many health benefits for the body while also having an influence on the individual's psychosocial in the environment. Perceived sleep quality in non-clinical fatigue is not correlated with cognitive function or work performance [30]. For the most part, however, these results are not in line with findings from other literature i.e., there is much support for the correlation between sleep disturbances and subjective cognitive performance and between sleep quality and performance. Emotional Intelligence has a direct effect on psychological effects and an indirect effect on almost all aspects of job stress [31].

In this research, it could be seen that the students at sport science faculty in Universitas Negeri Padang did not do too much strenuous physical activity. This was due to the state of the lecture situation that still used the online system. So, most of the students at sport science faculty did not do strenuous physical activity. Students did more light physical activity and spent more time by using gadgets. The use of gadgets was carried out with the aim of college activities such as zoom meetings, accessing e-learning, making lectures, and working on thesis.

Judging from the general data of respondents based on the year of class, most of them were the students at the year of 2018 and final year students who were working on their final project or thesis. Based on this, it could be seen that respondents spent more time doing physical activities, doing final assignments or theses and resulting in spending more time in front of the laptop until late at night. In accordance with the results of research conducted by Hastuti stated that there was a correlation between sleep quality and smartphone used [32]. Excessive use of smartphones will reduce sleep hours in students. This happens due to the light in the device which causes the heroine rhythm mechanism to be inhibited [33].

4. Conclusions

Based on the results of the analysis, it can be concluded that the better the intensity of physical activity, the higher the emotional intelligence. The lighter the stress, the higher the emotional intelligence. The better the quality of sleep, the higher the emotional intelligence. The better the intensity of physical activity, the lower the stress level. The lighter the stress, the better the sleep quality. However, there is no significant negative correlation between physical activity and sleep quality. This means that it is not proven that the heavier the level of physical activity, the better the level of sleep quality.

REFERENCES

[1] P. R. of Indonesia, *Undang-Undang Republik Indonesia Nomor 36 Tahun 2009 Tentang Kesehatan*, vol. 369, no. 1. 2009, pp. 1689–1699.

[2] A. Nurwansyah and E. Sepdanius, "Kepribadian Atlet Olahraga Kontak Fisik dan Non Kontak Fisik di Kota Padang," *J. STAMINA*, vol. 3, no. 2, pp. 58–66, 2019, [Online]. Available: hhttp://stamina.ppj.unp.ac.id/index.php/JST/article/view/899/379.

[3] D. Goleman, *Emotional Intelligence Kecerdasan Emosional*. Jakarta: PT Gramedia Pustaka Utama, 2018.

[4] S. O, "Understanding and developing emotional intelligence. InKnowledge solutions 2017," Singapore: Springer, 2017, pp. 325–339.

[5] S. Anggraini and A. Alnedral, "Hubungan Kebugaran Jasmani Terhadap Kecerdasan Emosional Atlet Pencak Silat," *J. JP&O, J. Pendidik. dan Olahraga*, vol. 2, no. 1, pp. 114–118, 2019.

[6] Hesti Wulandari, "Hubungan Antara Kualitas Tidur Terhadap Kebugaran Jasmani Siswa Peserta Ekstrakurikuler Futsal Kelas Xi Dan Xii Sma Negeri 1 Lendah Kabupaten Kulon Progo," *J. Chem. Inf. Model.*, vol. 53, no. 9, pp. 1689–1699, 2013.

[7] A. Skurvydas *et al.*, "What Types of Exercise Are Best for Emotional Intelligence and Logical Thinking?," *Int. J. Environ. Res. Public Health*, vol. 19, no. 16, p. 10076, 2022, doi: 10.3390/ijerph191610076.

[8] S. Kusumadewi and H. Wahyuningsih, "Model Sistem Pendukung Keputusan Kelompok untuk Penilaian Gangguan Depresii, Kecemasan dan Stress Berdasarkan DASS-42," *J. Teknol. Inf. dan Ilmu Komput.*, vol. 7, no. 2, p. 219, 2020, doi: 10.25126/jtiik.2020721052.

[9] C. S. Wong and K. S. Law, *The effects of leader and follower emotional intelligence on performance and attitude: An exploratory study*, vol. 13. 2017.

[10] B. Merch, M. Brocel-baja ña, J. Pambabay-calero, and S. Bauz-olvera, "Multivariate Analysis on Physical Activity, Emotional and Health Status of University Students Caused by COVID-19 Confinement," 2022.

[11] J. A. Okely *et al.*, "Change in physical activity, sleep quality, and psychosocial variables during COVID-19 lockdown: Evidence from the lothian birth cohort 1936," *Int. J. Environ. Res. Public Health*, vol. 18, no. 1, pp. 1–16, 2021, doi: 10.3390/ijerph18010210.

[12] Evi Tri Wahyuni, "Aktivitas Fisik dengan Intensitas yang Sering Dapat Meningkatkan Kecerdasan Emosional pada Remaja," *Indones. Sch. J. Nurs. Midwifery Sci.*, vol. 1, no. 03, pp. 106–112, 2021, doi: 10.54402/isjnms.v1i03.60.

[13] P. Riyanto and D. Mudian, "Pengaruh Aktivitas Fisik Terhadap Peningkatan Kecerdasan Emosi Siswa," *J. Sport Area*, vol. 4, no. 2, pp. 339–347, 2019, doi: 10.25299/sportarea.2019.vol4(2).3801.

[14] T. Ilham and E. Sepdanius, "Pengaruh Latihan Aktivitas Fisik terhadap Kemampuan Motorik Kasar Siswa Kelas V SDN 09 PPA Kota Solok," *J. Stamina*, vol. 3, no. 6, pp. 465–480, 2020.

[15] C. M. Sadacharan, "Effect of post-exercise yoga poses on eccentric exercise-induced muscle soreness, pain, and activities of daily living," *International Journal of Human Movement and Sports Sciences*, vol. 9, no. 1, pp. 19–26, 2021, doi: 10.13189/saj.2021.090103.

[16] S. Hussain, A. Ali, Y. G. Choi, and J. Hwang, "Assessing the difference of emotional intelligence among visually impaired, blind cricketers, and non-cricketers," *Sustain.*, vol. 13, no. 5, 2021, doi: 10.3390/su13052955.

[17] P. A. Lestari, M. D., & Ni, "Gambaran Tingkat Stres dan Mekanisme Koping Lansia dengan Penyakit Kronis pada Masa Pandemi Covid-19 di RW 05 Cibuluh Kota Bogor Tahun 2021," Politeknik Kesehatan Kemenkes Bandung, 2021.

[18] P. Carmen, M. Molero, M. Sim, and A. Bel, "Emotional E ff ects of the Duration, E ffi ciency, and Subjective Quality of Sleep in Healthcare Personnel," 2019.

[19] K. T. Han, "Effects of three levels of green exercise, physical and social environments, personality traits, physical activity, and engagement with nature on emotions and attention," *Sustain.*, vol. 13, no. 5, pp. 1–28, 2021, doi: 10.3390/su13052686.

[20] I. O. P. Sulana, S. A. S. Sekeon, and E. M. Mantjoro, "Hubungan Tingkat Stres Dengan Kualitas Tidur Mahasiswa Tingkat Akhir Fakultas Kesehatan Masyarakat Universitas Samratulangi," *J. Kesmas*, vol. 9, no. 7, pp. 37–45, 2020.

[21] A. Deta, A. Vida, F. Kedokteran, U. Kristen, and D. Wacana, "Hubungan kualitas tidur dengan kecerdasan emosional pada pegawai pendukung akademik universitas kristen duta wacana," 2021.

[22] I. E. Ahmad, S. Rijal, and H. Haryati, "Faktor yang Mempengaruhi Kualitas Tidur Mahasiswa Fakultas Kedokteran Universitas Halu Oleo," *J. Surya Med.*, vol. 5, no. 2, pp. 42–53, 2020, doi: 10.33084/jsm.v5i2.1290.

[23] A. Y. Alfarisi, R., Sandayanti, V., & Feryaldi, "Hubungan Aktivitas Olahraga Dengan Toleransi Stres pada Mahasiswa Fakultas Kedokteran Universitas Malahayati Bandar Lampung," *J. Dunia Kesmas*, vol. 8, no. 2, pp. 80–85, 2019, doi: https://doi.org/10.33024/jdk.v8i2.1403.

[24] T. Slavinski, D. Bjelica, D. Pavlović, and V. Vukmirović, "Academic performance and physical activities as positive

factors for life satisfaction among university students," *Sustain.*, vol. 13, no. 2, pp. 1–17, 2021, doi: 10.3390/su13020497.

[25] L. Sherwood, *Fisiologi Manusia Edisi 2*. Jakarta: EGC, 2011.

[26] P. Y. Wang, K. L. Chen, S. Y. Yang, and P. H. Lin, "Relationship of sleep quality, smartphone dependence, and health-related behaviors in female junior college students," *PLoS One*, vol. 14, no. 4, pp. 1–13, 2019, doi: 10.1371/journal.pone.0214769.

[27] M. C. Baso, F. L. F. . Langi, and S. A. . Sekeon, "Hubungan Antara Aktivitas Fisik Dengan Kualitas Tidur Pada Remaja Di Sma Negeri 9 Manado," *Kesmas*, vol. 7, no. 5, pp. 5–10, 2019.

[28] R. Weinberg and G. Daniel, *Foundations of Sport and Exercise Psychology 7th Ed.*, 7th ed. United States of America: Human Kinestetics, 2019.

[29] C. Ma, L. Zhou, W. Xu, S. Ma, and Y. Wang, "Associations of physical activity and screen time with suboptimal health status and sleep quality among Chinese college freshmen: A cross-sectional study," *PLoS One*, vol. 15, no. 9 September, pp. 1–16, 2020, doi: 10.1371/journal.pone.0239429.

[30] D. M. Van Dijk, W. Van Rhenen, J. M. J. Murre, and E. Verwijk, "Cognitive functioning, sleep quality, and work performance in non-clinical burnout: The role of working memory," *PLoS One*, vol. 15, no. 4, pp. 1–23, 2020, doi: 10.1371/journal.pone.0231906.

[31] G. D. Valenti, P. Faraci, and P. Magnano, "Emotional intelligence and social support: Two key factors in preventing occupational stress during COVID-19," *Int. J. Environ. Res. Public Health*, vol. 18, no. 13, 2021, doi: 10.3390/ijerph18136918.

[32] R. Y. Hastuti and E. N. Baiti, "Hubungan Kecerdasan Emosional Dengan Tingkat Stress Pada Remaja," *J. Ilm. Kesehat.*, vol. 8, no. 2, pp. 82–91, 2019, doi: 10.35952/jik.v8i2.152.

[33] J. Tristianingsih and S. Handayani, "Determinan Kualitas Tidur Mahasiswa Kampus A di Universitas Muhammadiyah Prof DR Hamka," *Perilaku dan Promosi Kesehat. Indones. J. Heal. Promot. Behav.*, vol. 3, no. 2, p. 120, 2021, doi: 10.47034/ppk.v3i2.527.