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The Relationship between Sleep Quality and Physical Fitness in Futsal Athletes

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Abstract

This study aims to determine the influence of sleep quality on cardiorespiratory physical Fitness in Futsal Student Activity Unit STKIP Pasundan Cimahi athletes. This research is a Correlational Descriptive research using survey and experimental methods with data collection techniques using the PSQI questionnaire to measure sleep quality and the Bleep Test to measure cardiorespiration in STKIP Pasundan Cimahi Futsal Student Activity Unit athletes. In this study, 20 athletes were sampled using the sampling method, namely total sampling. Based on the problems studied and the type of correlational descriptive research, data is used to correlate sleep quality and bleep test results to measure cardiorespiration. The results of maintaining good sleep quality on the physical fitness of Futsal Student Activity Unit STKIP Pasundan Cimahi athletes were obtained by calculating the correlation test that the sig. 0.380 > 0.05. These results show a significant negative relationship between sleep quality and cardiorespiratory physical fitness variables. This negative relationship means that the lower the level of sleep quality, the higher the level of cardiorespiratory physical fitness.

How to Cite

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INTRODUCTION

Performance athlete is gathered from the results an athlete achieves in doing Assign job to her (Aris Kurniawan, 2020). Sports achievements according to Law Number 3 of 2005 concerning the National Sports System CHAPTER I Article I Number 17 state that achievements result from maximum efforts achieved by sportsmen or groups of sportsmen (teams) in sports activities. Sports achievement is a complex action that depends on many factors, conditions, and other influences. Achievement is everything that someone can achieve, whether in sports, law, economics, music, politics, business, or other fields, where the achievements accomplished by someone are certainly not the same as those of other people (Susanti., 2016).

People who excel have good character, such as being oriented towards a better future, focused on their goals, responsible, brave enough to take risks, good at managing time, willing to accept criticism, and able to use it as a lesson to become better, abstinence give up, and so on. These factors greatly influence an athlete's performance in achieving success or achievement. Especially the athlete's physical fitness. Physical fitness is the quality of a person's ability to carry out activities according to their work optimally without causing health problems and excessive fatigue (F. Suharjana., 2018). The development of athletes' physical fitness aims to improve their physical condition so they can participate in all training processes well to achieve the goal. Physical fitness is one aspect that allows someone to do an activity productively daily without excessive fatigue and still have the reserve power to enjoy free time with good or sudden activity (Anwar, JF, & Hartoto, 2019).

Physical fitness is necessary for humans because it supports the results of our activities. Therefore, physical fitness related to a student is an important aspect that must be maintained. To maintain their fitness, students are required to be able to regulate their lifestyle by regularly exercising or avoiding food that is not suitable for their body so that students will have the level of physical fitness they want to have so that they can maximize their mind and energy for activities at school. (Sobarna et al., 2020). Physical fitness at a reasonable level will enable an athlete to work effectively and efficiently, not get injured easily, compete with enthusiasm, and optimally face challenges and even tricky competitions. Physical fitness is generally influenced by two factors, namely internal factors and external factors. Internal factors, such as genetics, age, and gender, are already present in a person's body and are permanent. External factors include nutrition, smoking, rest, sleep, and exercise (Muhibbut Thibri, Tuti Restuastuti, 2019).

Physical fitness includes many factors that can improve an athlete's physical performance. Many influence the development and level of an athlete's physical fitness. To achieve quality of life, three aspects must be met, and one of them is quality sleep or rest. Sleep is a basic need for every human being. Everyone cannot be separated from sleep, and a person's condition depends on the quality of their sleep.

Meanwhile, what is meant by sleep quality is an individual's ability to stay asleep, not just the amount or duration of sleep (Sulistiyani Cicik., 2012). Sleep quality shows an individual's ability to sleep and get the rest that suits their needs. Poor sleep quality results in decreased physiological and psychological health. Physiologically, poor sleep quality can cause low levels of individual health and increase fatigue or fatigue. Psychologically, low-quality sleep can result in emotional instability, lack of self-confidence, excessive impulsiveness, and carelessness (Rohmawati, 2012). Sleep, which awakes well, can return to fitness or rest the body's organs after doing an activity or sport. On condition Sleep, the body carries out the recovery process To restore body stamina until it is in optimal conditions (Safaringga, E., & Herpandika, 2018).

Sleep or rest is a basic need that everyone needs. Sleep is defined as a state of change in consciousness, where various degrees of stimulus can lead to a state of complete wakefulness. Sleep is also a cyclical physiological process that alternates with a longer period than wakefulness (Potter, P. A., & Perry, 2015). Good quality sleep is vital to a person's health and well-being. Physical activity can affect a person's sleep quality. Physical activity will cause fatigue, produce DIPS (delta-inducing peptide sleep) protein, and improve sleep quality (Nurhayati, N., Angela, FC & Langi, 2018). Sleep can maintain heart function, as seen when the heart rate decreases by 10 to 20 times every minute. In addition, during sleep, the body releases growth hormones to repair and renew epithelial and specialized cells such as brain cells. The brain will filter the information recorded during the day and get optimal oxygen intake and cerebral blood flow so that memory storage and cognitive recovery occur during sleep (Fakihan, 2016).

The experience of various athletes, teams, and the wider community shows that many things

are still being debated about the impact of sleep quality on physical fitness. Some think that physical fitness is not entirely based on the quality of sleep but rather on the enthusiasm or motivation of the athlete himself. They believe that failure in a tournament is due to technical weaknesses, and tactics are blamed as the main cause. In countries with advanced sporting achievements, lack of motivation is blamed as the main cause. This different opinion is because technical weaknesses are still prominent in developing countries, whereas technical and physical abilities are not a problem in developed countries, so motivation is the key to the success of excellent performance.

So many people think the athlete's desires or motivation can shape physical fitness. Meanwhile, motivation will not appear if the athlete's mental and physical condition is not optimal. Therefore, good quality sleep is needed to maintain an athlete's physical and psychological condition during training and competition. Physical fitness can be improved by guarding sleep well. Because the benefit of sleep is to restore our body's metabolism, when we think we are tired, we want to rest. Sleeping can also be a problem. For example, not getting enough sleep will cause the body to feel less comfortable and too lazy to be active or carry out activities the next day. Sleeping correctly is healthy because the optimal time is set for when we sleep and wake up, which is a good and necessary thing. held (Iskandar J., 2014).

But many people, too, are athletes who don't care about quality Sleep. They're friendly. That on purpose nor No on purpose. Several athletes sigh because they experience disturbances like difficulty sleeping, lack Of calm, most of the time awakening in the middle of the night, and often sleepy early in the evening day (Safaringga, E., & Herpandika, 2018). That matter bias influences an athlete's physique and mood, and the next day, less quality sleep can cause severe drowsiness when in the field weak moments when operating an exercise, or a match.

Disturbance Sleep like That can attack Who, of course, but some deliberate athletes stay up late at night only to chat with friends until late evening, playing games until they forget time. Sleep or stay up late only To watch the football club they like. In children and adolescents, sleep disorders are influenced by non-medical and medical factors. Non-medical factors include gender, age, lifestyle, family circumstances, and environment (Radityo, 2020). Sleep disorders in adolescents cause concentration problems, mood and behaviour regulation disorders, and cognitive disorders. Electronic media is a risk factor for sleep disorders among teenagers (Amalina, S., Neni Sitaresmi, M., Laksmi Gamayanti, & Laksmi Gamayanti, 2015). Lack of sleep over a long period can cause an increase in glucocorticoid hormones, inhibiting neurogenesis in the hippocampus and impacting learning and memory processes (Mirescu, C., Peters, J.D., Norman, L., & Gould, 2016). Sleep can be said to be a physiological need that occurs due to changes in the structure of consciousness, characterized by the level of awareness and response to stimuli. In its implementation, several Indonesian people complained about the quality of their sleep, such as night workers, shift workers, and so on. Several factors influence a person's sleep quality, including illness, environment, physical exercise and fatigue, emotional stress, habits before bed, consumption of drugs and substances, and diet. (Yulia Rahmawati, IJ, & Indonesia, 2019). In addition, insufficient hours of sleep have also been proven to affect metabolism and endocrine function, increase the perception of exertion during exercise, and interfere with performance outcomes such as weight training (Mah, CD, Kezirian, EJ, Marcello, BM, & Dement, 2018). Lack of sleep can increase the risk of injury and illness, reducing training availability and harming overall health (Watson, 2017). Poor sleep quality and inadequate hours of sleep experienced have essential implications, potentially leading to increased mental and physical health consequences, increased risk of injury, and impaired daytime functioning and performance outcomes. Athletes and coaches should consider daily sleep requirements and promote training and travel schedules that support good quality sleep and regularly allow for adequate sleep hours. Athletes with clinically significant sleep problems were more likely to report poorer quality sleep hygiene, more common health complaints, and mood disorders (Biggins, M., Purtill, H., Fowler, P., Bender, A., Sullivan, K.O., Samuels, C., & Cahalan, 2019).

For example, athletes will experience enough activity and consume time sleeping, so they may experience disturbance in quality sleep and continue with disruption in physical fitness as a futsal athlete. Fitness is tightly connected with activity physique. Every athlete has a different physique. One with others, it's automatic fitness. Their bodies are different, too. Therefore, apart from maintaining the quality of sleep, the training program must also be in accordance with the characteristics of the sport and the movement characteristics of the actual competition (Syamsudar, B., & Nurcahya, 2022). aintaining

sleep quality is the same as maintaining physical fitness. Factors that influence a person's level of physical fitness are not only caused by sleep quality. Physical fitness levels can be supported by exercise or physical activity (Indik, Endang Sunarya, Bastinus N. Matjan, Aming Supriyatna, Sumardiyanto, Badruzaman, dan Supardi, 2019). That matter shows a correlation between these two variables, although these two variables are low (Anwar, JF, & Hartoto, 2019).

One of the challenges is coaches or teachers. Educator moment: This teaches how to style a healthy, stylish, orderly life for athletes and participants to educate and make it a reality. One of them is to teach good discipline to the head athlete or participants and educate them to guard quality sleep to get fit performance for the athlete in running an exercise program or a tough match.

In this study, there is a problem formulation as follows "Is there a relationship between sleep quality and physical fitness in futsal athletes?" and this study aims to determine the relationship between sleep quality and physical fitness in futsal athletes.

The novelty in this study is using data from smartwatches or sleep trackers to objectively measure sleep duration, efficiency, and quality. Focusing on athletes aged 18–22 who are still in the developmental phase of physical and sleep habits. Looking at the relationship between sleep and fitness aspects that are more relevant to futsal.

METHODS

Figure 1. Research Design

This type of research is quantitative research with a correlation method (Andi Fitriani Djollong., 2014). (sugiyono, 2016) said quantitative research is research where the kind of data and analysis is in the form of data in the form of numbers or qualitative data in the form of numbers. Research does not start from methods but must start from the root of the problem. Correctly formulating the research paradigm and background will help researchers design research designs and determine the methods to be used. A quantitative, qualitative, or mixed approach can be used (Zaluchu, 2020). Meanwhile, correlation research aims to determine the relationship between two or more variables. Futsal, where there is one independent variable and one dependent variable.

The population in this study was 20 STKIP Pasundan Cimahi Futsal Student Activity Unit athletes. The technique used in sampling in this research was total sampling data. Total sampling is a sampling technique that uses the number of samples within a population. Researchers use their judgment to decide who will provide the most valuable data rather than relying on statistical probability. The sample for this research was 20 athletes from Futsal Student Activity Unit STKIP Pasundan Cimahi, with 30 male athletes. The instrument used for sleep quality is the PSQI (Pittsburg Sleep Quality Index) questionnaire, and the instrument used for physical fitness is the Multistage Fitness Test with the Bleep Test instrument.

Descriptive data analysis techniques are used to provide an overview of the characteristics of the distribution of scores/values for each variable studied. Inferential data analysis techniques are also used. Descriptive analysis and central and spread sizes are used for data presentation. Data are presented using histograms and frequency distribution lists. Minimum and Maximum values, Mean (mean), middle mean (median), and frequently occurring values (mode) are examples of centralized measurements. Variance and standard deviation are examples of dispersion measurements. In contrast, route analysis is used to assess hypotheses and the need for analysis, as well as inferential and causal analyses.

Before testing the hypothesis, analysis requirements include normality, linearity, and simple regression hypothesis tests. Normality testing uses the Kolmogrof-Smirnov test. The criteria used to determine whether a distribution is normal is if $p > 0.05$ (5%) the distribution is declared normal, and if $p < 0.05$ (5%) the distribution is said to be abnormal. Judging from the table above, after carrying out the linearity test with SPSS 21, it can be seen that table values are based on the test criteria. If sign. > 0.05, then there is a homogeneity relationship; if the sign < 0.05, there is no homogeneity relationship. To test the hypothesis using correlation analysis with the parametric statistical method Pearson Product-Moment Correlation Coefficient (Pearson Product-Moment Correlation Coefficient) using the formula :

$$r_{xy} = \left(n\sum xy - \left(\sum[x)\left(\sum[y)\right]\right]\right) / \sqrt{\left(\{n\sum[x^2 - (\sum x)^2\}\{n\sum[y^2 - (\sum y)^2\}\right]\right]}.$$

RESULTS AND DISCUSSION

The data used in this research consists of 2 variables: sleep quality and physical fitness. The data is data from Futsal Student Activity Unit STKIP Pasundan athletes. The following is a detailed description of the 2 data variables used, namely:

Table 1. Description of the 2 data variables

Test	N	Min	Max	Sum	Mean	Std. Deviation	Range	Variance
Sleep Quality	20	5	13	196	9.80	2,608	8	6,800
Bleep Test	20	25	37	631	31.55	3,300	12	10,892

Normality testing uses the Kolmogrof-Smirnov test based on sleep quality data and the Bleep Test at Futsal Student Activity Unit STKIP Pasundan Cimahi. The criteria used to determine whether a distribution is normal or not are if $p > 0.05$ (5%) the distribution is declared normal, and if $p < 0.05$ (5%) the distribution is said to be abnormal. The results of the Normality of Sleep Quality test on Physical Fitness at Futsal Student Activity Unit STKIP Pasundan Cimahi are as follows:

The significance value of sleep quality is 0.397>0.05

The significance value of cardiorespiratory physical fitness is 0.812>0.05

The conclusion based on the table above is that because the significance value of the two variables is more significant than 0.05, it can be concluded that the data for the sleep quality of Futsal Student Activity Unit STKIP Pasundan Cimahi athletes and the cardiorespiratory physical Fitness of Futsal Student Activity Unit STKIP Pasundan Cimahi athletes is normally distributed.

This homogeneity test uses SPSS 21 to test the equality of data variances on sleep quality and cardiorespiratory physical Fitness at Futsal Student Activity Unit STKIP Pasundan Cimahi. The summary of data homogeneity tests for sleep quality tests and cardiorespiratory physical fitness tests at Futsal Student Activity Unit STKIP Pasundan Cimahi is as follows:

A hypothesis is a temporary answer to a problem that has been formulated; therefore, it must be tested empirically. Testing is carried out to find out whether the data collected supports the hypothesis or, on the contrary, rejects the proposed theory. For this reason, this research uses correlation analysis with the parametric statistical method Pearson Product-Moment Correlation Coefficient (Pearson Product-Moment Correlation Coefficient) using the Pearson formula in Microsoft Excel software in ba. The results of the correlation analysis between sleep quality variables and cardiorespiratory physical Fitness of Futsal Student Activity Unit STKIP Pasundan Cimahi athletes are as follows Correlation Test:

$$r\_xy= (n\sum xy- (\sum[x) (\sum[y)]])/\sqrt({n\sum[x^2-[(\sum x)]^2} {n\sum[y^2- [(\sum y)]^2}]])$$

$$[\_]= ((20)(6246)- (196)(631))/\sqrt({(20)(2050)-(196)^2 }{(20)(20115)-(631)^2})$$

$$[\_]= 0,380388$$

Based on the parametric statistical method calculation, the Pearson Product-Moment Correlation Coefficient, using the formula above, obtained a result of 0.380. These results are obtained from variable x, namely Sleep Quality, and variable Y, namely the results of the cardiorespiratory Bleep Test. These results show a correlation of $0.380 > 0.05$, which can be a significant negative relationship between the sleep quality variable and the cardiorespiratory physical fitness variable. This negative relationship means that the lower the level of sleep quality, the lower the level of cardiorespiratory physical fitness.

This study aims to determine the relationship between sleep quality. The results of the cardiorespiratory Bleep test on Futsal Student Activity Unit STKIP Pasundan Cimahi athletes were obtained from analysis of the data that has been presented; namely, the correlation coefficient found was 0.380, which is in the low category. So, a moderate relationship exists between sleep quality (X) and Physical Fitness (Y). And there is a significant relationship with the results of tcount = 2.680 with $\alpha = 0.05$ and $n = 20$. Based on these results, it is stated that t-count falls in the Ho rejection area, so it can be noted that the correlation between sleep quality and physical fitness of 0.380 is significant. Based on the data obtained in this research, the correlation coefficient was found to be 0.380, which is in the low category. Therefore, there is a low relationship between sleep quality (X) and physical Fitness (Y). Based on the explanation above, it can be assumed that there is a significant negative relationship between the sleep quality variable and the cardiorespiratory physical fitness variable. This negative relationship means that the lower the level of sleep quality, the lower the level of cardiorespiratory physical fitness.

Based on the results of this study, it can be seen that poor sleep quality can cause the body to

become tired and the immune system to decrease, resulting in muscle contractions which cause futsal athletes to experience cramps. This research is in accordance with (Priyonoadi, 2012) quality sleep is very necessary for futsal athletes because in sleep there is a recovery process, this process is useful for restoring the body's condition that is experiencing fatigue so that when playing futsal physical endurance remains good and reduces muscle contractions. Sleep conditions create a sense of awareness that stops making the body rest or relax, making the brain work normally so that blood circulation throughout the body is smooth which causes muscle relaxation, if the need for sleep in futsal athletes is met for more than 7 am then it provides physical fitness when waking up in the morning so that good endurance is created when playing futsal.

Sleep quality can create physical endurance such as a body that is resting is relaxed, makes the brain work normally, smoothens blood circulation throughout the body which causes muscles to relax, if sleep needs are met then it provides physical fitness when waking up in the morning which creates physical endurance when playing futsal. This is supported by the opinion (Saputra et al., 2019) Physical endurance is the body's ability to adapt to the physical load placed on the body in daily activities without causing excessive fatigue.

The results of this study are in accordance with research conducted by Siagian (2014) proves that there is a significant relationship between sleep quality and the ability of athletes to play futsal. This is also supported by the opinion (Priyonoadi, 2012) that futsal athletes who experience poor sleep quality can cause physical fatigue and weak muscle coordination systems so that they are prone to muscle contractions that can cause cramps. Actions to avoid cramps when playing futsal include getting enough sleep for 7 hours at night, warming up before and after playing and getting enough nutrition 2 hours before playing. In addition, according to (Al Baihaqi et al., 2022), Futsal athletes who experience poor sleep quality should not force themselves to play futsal because the body's tissues lack an immune system and a weak coordination system, making it easier to experience cramps.

A good exercise is done at least three times a week with a rest period of no more than 2 x 24 hours. The more Good quality sleep is done, the more physical activity is done, so the level of fitness in his body is getting better. Sleep quality and physical fitness have a close relationship (Gunarsa & Wibowo, 2021).

CONCLUSION

Based on the results of the study, it can be concluded that there is a significant relationship between sleep quality and physical fitness in athletes of the STKIP Pasundan Cimahi Futsal student activity unit. With the calculation of the correlation test, the sig. value was obtained as much as 0.380 > 0.05. This means that changes in sleep quality have a real impact on the level of physical fitness of futsal athletes, and this relationship is not just a coincidence. Adequate and quality sleep helps the process of muscle recovery, hormone regulation, and increasing body metabolism.

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