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Research Article

Community-Based Jogging Intervention on Sleep Quality: A Study in the Rondarun Ratik Togak Community

Muthia Azella[1], Ridwan Sinurat[2*], Muarif Arhas Putra[3]

[1,2,3] Sports and Health Education Study Program, Pasir Pengaraian University, Indonesia

Email author corresponding: idonsinurat@gmail.com

Abstract:

Background: This research is motivated by increasing cases of poor sleep quality, low physical activity levels, and growing interest in community-based jogging as a wellness intervention.
Aims: To examine the effect of a community-based jogging program on improving sleep quality and overall well-being among members of the Rondarun Ratik Togak Community.
Methods: This study uses a quantitative descriptive method with an instrument in the form of a questionnaire distributed to 30 respondents. The questionnaire used refers to a Likert scale to measure respondents' perceptions of the effect of jogging on sleep quality. The instrument has undergone validity and reliability tests, with 39 valid questions out of a total of 47 questions. Data collection was carried out through observation, documentation and distribution of questionnaires. The data analysis technique uses a percentage approach and data processing follows the Sturges formula to determine the number and length of interval classes.
Result: The results showed that of the 30 respondents, 10 people (33%) were in the very high category, 5 people (16%) in the high category, 7 people (23%) in the medium category, 2 people (7%) in the low category, 2 people (2%) in the very low category, and 4 people (13%) in the very low category.
Conclusion: From these data, it can be concluded that overall, the relationship between jogging and improved sleep quality is categorized as "very strong".

Keywords: *Community-Based, Jogging, Sleep Quality*

Introduction

Background of the study: Moving the body continuously is not merely a physiological act but a manifestation of human responsibility toward one's own existence (Ashadi, 2014; Hanlon & Taylor, 2024). From a scientific perspective, sustained catalyzes maintaining bodily homeostasis, strengthening vital organ functions, and balancing hormonal processes that preserve the harmony of life systems (Ashari et al., 2022; Lankhaar et al., 2021; Scally & Lord, 2019). Beyond that, true health is not measured solely by the absence of disease but by an individual's ability to consciously and harmoniously regulate the rhythm of life (Saunders et al., 2016; Seni Oktriani et al, 2022). The awareness to move and maintain a balanced lifestyle represents an adaptive intelligence of humankind in responding to the dynamics of modern times a reflection that health is not simply the result of medical intervention, but rather the ongoing dialogue between the body, the mind, and the environment (Buchner & Hofmann, 2022; Chan et al., 2025).

Law (No. 11 Tahun 2022) regulates sports in Indonesia. This law aims to protect, advance, and improve public welfare through sports, as well as enhance national sports achievements. It governs various aspects related to sports, including development, management, organization of

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championships, and the roles of sports actors. Therefore, sports such as jogging are expected to improve quality of life, including by enhancing sleep quality (Peikenkamp et al., 2025).

Both the advantages and disadvantages of sleep can be harmful to health (Ashari et al., 2022b). People who lack sleep have a two to three times higher risk of developing congestive heart failure, a condition in which the heart weakens and fails to pump blood effectively throughout the body, resulting in bodily imbalance and disruption of other organs (Lestari et al., 2018). On the other hand, individuals who sleep excessively are at risk of morbidity, meaning they are more susceptible to illnesses such as hypertension, diabetes, cardiac arrhythmia, poor overall health, and even death (Hirshkowitz et al., 2015). During sleep, all vital body functions decrease, metabolic levels slow down, body cells used during physical activity are repaired, and energy is restored (Siti Sofiah et al, 2020). Conversely, poor sleep quality can have negative impacts on the body (Anisa Ayu Yolanda et al, 2019).

In an effort to address the issue of declining sleep quality, various approaches have been developed, encompassing both medical and non-medical interventions aimed at improving human well-being (Gayathri Devi et al., 2025; Liang et al., 2025). One non-pharmacological approach that has gained significant attention in the field of health sciences is physical activity or exercise. Physiologically, physical activity has been proven to influence the autonomic nervous system, reduce stress levels, and optimize the secretion of hormones that regulate the sleep cycle (Orr et al., 2025; Rafie et al., 2018). Among various forms of physical exercise, jogging is one of the most recommended activities due to its moderate aerobic intensity, which can be easily adjusted to individual capabilities (Markovic & Mikulic, 2010; Sebata, 2025). Jogging is not merely a slow running activity but a form of self-regulated physical engagement that stimulates cardiovascular performance, enhances energy metabolism, and balances the body's biological rhythm or circadian rhythm (Kobayashi et al., 2025; Liang et al., 2025; Torres & López Frías, 2025). Beyond its simplicity and the fact that it can be performed outdoors, jogging also holds a profound psychological dimension: it serves as a reflective medium that connects the body, mind, and environment, thereby contributing to better sleep quality and a more harmonious balance of life (MacIntosh et al., 2025; Vítková et al., 2025).

As a moderate-intensity aerobic exercise, jogging stimulates the cardiovascular system, balances stress hormones, and enhances the production of endorphins that help calm the nervous system (Henriksen et al., 2024; Liang et al., 2025). Scientifically, this activity not only strengthens physical fitness but also helps stabilize the circadian rhythm the biological mechanism that regulates one's sleep-wake cycle (Jäger et al., 2025; Neill et al., 2025). Therefore, jogging should not merely be viewed as a recreational sport but rather as a scientific intervention that reflects the harmony between bodily movement, psychological balance, and overall sleep health (Bailey et al., 2025; Meachon et al., 2025).

Literature review: Various studies, such as (Mendonca et al., 2025; Wang & Boros, 2021) have examined the relationship between jogging and sleep quality, yet the empirical findings remain inconsistent. Some studies report that jogging enhances sleep quality through physiological mechanisms such as increased endorphin production and stabilization of circadian rhythms. However, other studies, such as (Kianian et al., 2017; Lee et al., 2014; Mendonca et al., 2025) indicate that excessive exercise intensity or improper timing can actually disrupt nighttime sleep patterns. These discrepancies suggest that the relationship between jogging and sleep quality has not been comprehensively understood, particularly among the general population who engage in jogging for recreational rather than clinical purposes. Furthermore, aspects such as exercise frequency, duration, and individual psychological conditions that may influence the outcomes

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have not been thoroughly explored simultaneously. This gap highlights the need for further research to gain a more complete understanding of how jogging can serve as a non-pharmacological strategy to improve sleep quality in the community.

Gap analysis: This research lies in the selection of variables that have not been explicitly examined in previous studies on the relationship between jogging activity and sleep quality specifically, the influence of jogging frequency, duration, and timing on circadian rhythm adaptation and individual psychophysiological stability (Burgess et al., 2024; Hedlund et al., 2019). Previous studies have generally focused only on the general relationship between exercise and sleep quality without integrating temporal and psychological dimensions within a single analytical framework. This study introduces a new approach by exploring how differences in jogging time (morning, afternoon, or evening) and activity duration can modulate the neuroendocrine system involved in sleep and body recovery processes (Fisher et al., 2025; Kalak et al., 2012; Vikene et al., 2025). In addition, this research incorporates psychological aspects such as anxiety levels and mental conditions as moderating variables that may strengthen or weaken the physiological effects of jogging on sleep quality. Therefore, the novelty of this study lies not only in its empirical context but also in its conceptual construction, which connects physiological, temporal, and psychological variables within an integrative model an area that has been largely unexplored in previous scientific investigations (Li et al., 2025).

Rationale of the study: Based on observations of the Bundarun Ratik Togak (BRT) Community's activities in Pasir Pengaraian, it was found that jogging sessions are routinely conducted twice a week, with an average duration of 45 to 60 minutes per session. In each meeting, participants typically cover a distance of 4 to 7 kilometers, depending on the day's program—such as Easy Run, Long Run, or Interval Tempo. The Fun Run type is the most dominant activity, as it emphasizes light exercise and sustainable fitness rather than speed or long-distance competition. In terms of activity intensity, most participants fall into the moderate-intensity category, maintaining a heart rate between 60–75% of their maximum rate. This intensity level is considered ideal because it provides significant physiological benefits in improving blood circulation and energy metabolism without causing excessive fatigue. Regarding rest and recovery patterns, most members allocate 1–2 rest days between jogging sessions to allow muscle recovery and maintain body balance. Some also engage in light activities such as walking or stretching on non-training days to accelerate recovery. Brief interviews with several participants revealed that they experienced reduced stress levels and muscle tension after regularly participating in jogging sessions. The observation further indicated positive changes after joining the community's activities. Most participants reported that they fell asleep more easily and experienced better sleep quality compared to before they started exercising regularly. The average sleep duration increased from 5–6 hours to 6–8 hours per night, and their sleep was described as deeper and uninterrupted. This phenomenon is believed to be related to increased endorphin levels following physical activity and reduced stress levels, both of which play important roles in regulating the circadian rhythm, there are inhibiting factors such as limited training time due to work commitments and unpredictable weather conditions, which sometimes prevent participants from maintaining training consistency. Nevertheless, overall observations show that jogging activities with the BRT community have had a positive impact on members' physical fitness, mental well-being, and sleep patterns.

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Material & Methods

Research Design: This research employs a survey method with a quantitative descriptive approach to objectively and measurably describe the observed phenomena (Lisa Teyssier et al., 2025). This approach is used because it can present empirical data that reflect real conditions in the field while also explaining relationships between variables through statistical analysis. The method not only presents facts but also interprets trends and patterns that emerge from numerical data. Therefore, the quantitative descriptive approach serves as a means to obtain a factual, systematic, and scientifically tested depiction of the studied object, making the results a rational basis for decision-making and theoretical development in the relevant field (Roux, 2025).

Participant: The use of samples serves as a reflection of the population, providing a comprehensive overview of the phenomenon being studied. An essential principle to consider is that the selected sample must accurately represent the characteristics of the population, ensuring that the research findings can be properly and validly generalized (Sugiyono, 2019). In this study, the total population consists of 150 individuals, all of whom are members of a community with specific characteristics aligned with the research focus. To obtain relevant and in-depth data, the researcher employed a purposive sampling technique, which involves selecting samples based on specific considerations or criteria directly related to the research objectives. Through this approach, 30 participants were chosen as they best met the established criteria and were deemed capable of scientifically representing the population's characteristics. The selection of this technique is not only technical but also strategic, as it ensures that the collected data meaningfully contributes to a deeper understanding of the phenomenon under investigation.

Instrument: To obtain research data, instruments are required as tools (Suharsimi Arikunto, 2010). He stated that research instruments are tools or facilities used by researchers to collect data in order to make their work easier and produce better results, in the sense of being more accurate, complete, and systematic, so the data is easier to process. The instruments used in this study were questionnaires:

1. To measure physical activity, the Global Physical Activity Questionnaire (GPAQ), which has been translated into Indonesian, was used.
2. To assess sleep quality, the Pittsburgh Sleep Quality Index (PSQI) was used.

The validity and reliability of the questionnaires rely on findings from previous studies (Iqbal, 2017).

Analysis plan : **Data analysis** is carried out after data from all respondents or other data sources have been collected. The steps taken in analyzing the data are as follows:

Calculating Percentage

The formula used for percentage is: $P = \frac{F}{N} x\ 100$

Results

Results: The research was conducted on Saturday, May 31, 2025, from 5:00 PM to 6:00 PM (WIB). The study took place at the Bundarun Ratik Togak Pasir Pengaraian community.

This chapter discusses and presents the research findings on the relationship between jogging and the improvement of sleep quality. The data for this study were collected using a survey method by distributing questionnaire forms to members of the Bundarun Ratik Togak community. The descriptive statistical data from this study can be seen in the following table:

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Table 1. Descriptive Statistics Source: Data Processing, June 1, 2025

Descriptive Statistics	
N	30
Mean	140
Median	139
Mode	156
Standar Deviation	14
Range	47
Minimum	109
Maximum	156

Based on the descriptive statistics table above, the sample (N) in this study is the members of the Bundarun Ratik Togak community totaling 30 people, the average value (Mean) is 140, the middle value (Median) is 139, the repeated value (Mode) is 156, the standard deviation value (Standard Deviation) is 14, the data difference value (Range) is 47, the smallest value (Minimum) is 109, the largest value (Maximum) is 156. The results of this study aim to determine the relationship between jogging and improving the quality of sleep of the Bundarun Ratik Togak Community which is revealed through a questionnaire consisting of 39 questions. The results of the analysis of the relationship between jogging and improving the quality of sleep in the Bulatun Ratik Togak Pasir Pengaraian community, obtained a maximum value of 156, and a minimum value of 109. The data analysis score of the relationship between jogging and improving the quality of sleep has a mean value of 140, and a standard deviation value of 14. From 39 questionnaire questions for 30 sample people, the following research results were obtained:

Table 2. Description of the frequency of jogging exercise with improved sleep quality in the bundarun ratik togak pasir pengaraian community Source: Data Processing, June 1, 2025

No	Category	Intervals		Interval Class	Fr	%
1	Very Low	109	116	109-116	4	13%
2	Very Low	117	124	117-124	2	7%
3	Low	125	132	125-132	2	7%
4	Currently	133	140	133-140	7	23%
5	High	141	148	141-148	5	16%
6	Very High	149	156	149-156	10	33%
Amount					30	100%

Based on the table above, it is known that as many as 39 questionnaire questions from 30 respondents received answers from 10 people (33%) in the very high category, 5 people (16%)

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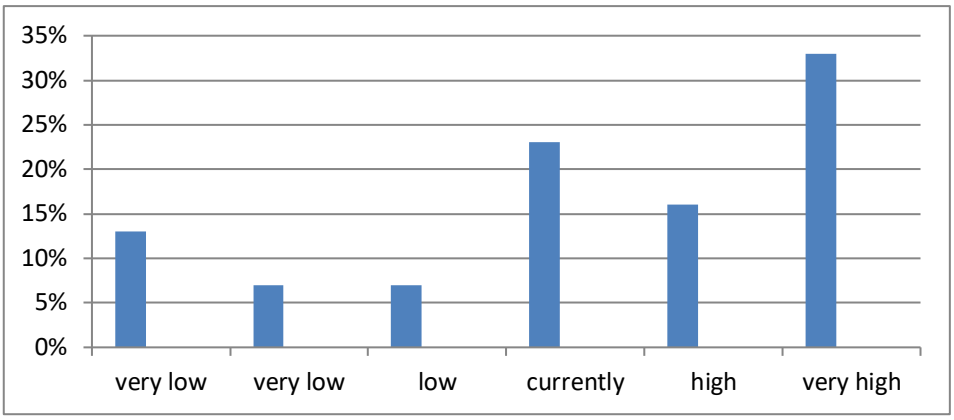
answered high, 7 people (13%) in the medium category, 2 people (7%) in the low category, 2 people (7%) in the very low category and 4 people (13%) in the very low category.

Figure 1. Bar Chart



This study aims to determine how much analysis of jogging sports improves sleep quality in the community of Pengaraian Bulatun Ratik Togak Pasir. Data collection in this study used a questionnaire that had been tested for validity and reliability consisting of 39 items to 30 respondents. Based on the results of the study on Saturday, May 31, 2025 at 17.00 to 18.00 WIB, showed that the level of relationship between jogging sports with improving sleep quality was in the "very high" category in detail, the very high category was 10 people with a percentage of 33%, the high category was 5 people with a percentage of 16%, the moderate category was 7 people with a percentage of 23%, the low category was 2 people with a percentage of 7%, the very low category was 2 people with a percentage of 7%, the very low category was 4 people with a percentage of 13%. The results of this study indicate that the level of analysis of jogging sports with improving sleep quality was in the "very high" category, which was 10 people with a percentage of 33%. To achieve the desired goal, a strong self-awareness is required in each individual regarding how jogging is related to improving sleep quality.

Discussion: Based on the descriptive analysis of 30 respondents, the mean score was 140 with a standard deviation of 14, indicating that, in general, the level of correlation between jogging activity and sleep quality falls within the high to very high category. This finding is supported by the frequency distribution data, which shows that 33% of respondents were in the very high category and 16% in the high category, signifying a strong positive correlation between jogging intensity and improved sleep quality. This study provides a new contribution to the field of recreational sports and public health research, particularly within non-professional communities such as fun run groups. Unlike previous studies that focused mainly on athletic subjects or specific age groups, this research highlights that social and recreational jogging activities can also have a significant impact on improving sleep quality. This phenomenon emphasizes that the physiological benefits of exercise are not solely determined by intensity or duration but also by social and psychological dimensions, such as a sense of togetherness, group motivation, and enjoyment of the activity itself.

Scientifically, the improvement in sleep quality among members of the community can be explained through physiological and psychological mechanisms. Physiologically, jogging

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enhances blood circulation, brain oxygenation, and the balance of serotonin and melatonin hormones, which play crucial roles in regulating the body's circadian rhythm (Wang & Boros, 2021). Psychologically, running with a community induces relaxation through the release of endorphins, which reduce stress and anxiety two major factors that contribute to sleep disturbances. Thus, jogging functions not only as a form of exercise but also as a medium for emotional regulation and mental recovery, contributing to better individual sleep quality.

When compared with previous studies, such as (Byun & Forrester, 2025), who found that moderate aerobic exercise for 30–45 minutes can improve sleep efficiency by up to 25%, the results of this study show a similar trend, albeit in a different context. However, a distinctive finding is that community-based jogging activities have a more stable impact on sleep quality compared to individual exercise. This may be due to collective motivational factors and social support among community members, which reinforce consistency in participating in physical activities. Therefore, this study broadens the understanding of the relationship between jogging activities and sleep quality within the general population. Jogging serves not only as a form of physical exercise but also as an adaptive mechanism of the body and mind to maintain biological balance and mental health. The results demonstrate that improving sleep quality can be achieved through non-pharmacological approaches based on healthy lifestyles and enjoyable social activities. Hence, it can be concluded that jogging is a simple yet effective intervention for enhancing sleep quality, particularly when performed regularly in a supportive social environment such as the Bundarun Ratik Togak Pasir Pengaraian community.

Conclusions

Based on the results of data analysis regarding the relationship between jogging activity and improved sleep quality among the community, it can be concluded that the correlation level falls into the "very high" category, with a percentage of 33%. This finding indicates that the more consistently individuals engage in jogging, the more significant the improvement they experience in their sleep quality. In other words, jogging not only serves as a form of physical fitness exercise but also acts as an effective non-pharmacological therapy for improving sleep patterns. These results affirm that active participation in physical activities such as jogging can be a simple yet highly impactful solution for enhancing holistic health, particularly in maintaining a balance between physical activity and recovery through quality sleep.

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Author Contribution Statement

All authors contributed substantially to this research. RS was responsible for formulating the research idea, designing the methodology, and developing the research instruments. MAP was involved in data collection and processing, as well as conducting statistical analyses of the research

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findings. MA contributed to the theoretical review, interpretation of results, and preparation of the discussion and conclusions. All authors actively participated in the writing, review, and final approval of the manuscript prior to publication.

AI Disclosure Statement

Part of the manuscript writing process involved the use of artificial intelligence (AI) technology, specifically ChatGPT (OpenAI, GPT-5), which was utilized in a limited manner to assist with the construction of academic sentence structures, language editing, and English grammar refinement to align with scientific standards. All ideas, data analyses, result interpretations, and research conclusions are entirely the work of the researcher, without any intervention or decision-making from the AI system.

Conflicts Of Interes

The author declares no conflict of interest that could influence the results, interpretation, or writing of this article. The entire research process from planning, data collection, and analysis to report preparation was conducted independently without any external intervention from institutions, sponsors, or individuals. Furthermore, the author did not receive any financial, material, or other forms of support that could potentially introduce bias into the study's findings. Therefore, all results presented in this article fully reflect an objective scientific investigation based on empirical data.

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