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The Effectiveness of Futsal Exercise in Reducing Stress Levels and Improving Sleep Quality in the Futsal X Community in Cirebon Regency in 2025

Indra Lesmana[1]*, Sri Wahyuni[2], Suharno[3]
Nursing Science Study Program, Faculty of Health Sciences, University YPIB Majalengka, Indonesia
Corresponding Author: Indra Lesmana
21142011064@stundents.univypib.ac.id

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ABSTRACT

Stress and sleep disorders are two prevalent health conditions among individuals of productive age and may exacerbate each other if not addressed effectively. This study aimed to determine the effect of futsal exercise on reducing stress levels and improving sleep quality. "This study involved 30 participants from the Futsal X Community in Cirebon Regency. Over one week, participants engaged in three 60-minute futsal sessions. Stress and sleep quality were measured using DASS-42 and PSQI, respectively. Results showed significant reductions in stress scores (22.43 to 10.20) and improvements in sleep quality (PSQI 9.10 to 5.20), with p-values < 0.001 for both outcomes.". The Wilcoxon Signed Rank Test yielded a p-value of 0.000 for both variables. These findings indicate that futsal exercise may produce positive effects on participants' psychological condition and sleep patterns. Therefore, futsal can be considered a non-pharmacological intervention strategy to support mental health and sleep improvement within community-based health practices.

INTRODUCTION

Stress and sleep disorders are two increasingly prevalent health issues among individuals in their productive years, particularly those who are socially, academically, or professionally active. These conditions are closely interrelated and can have detrimental effects on both physiological and psychological balance if not properly addressed.

According to Optiarni and Coralia (2023), stress is an emotional and physical reaction that arises when there is a mismatch between environmental demands and an individual's ability to cope with them. While a certain level of stress is adaptive, prolonged and uncontrolled stress can lead to serious health problems such as chronic fatigue, immune dysfunction, and psychosomatic disorders.

The Indonesian Ministry of Health (2019) defines stress as the body's response to ongoing psychosocial pressure. In today's modern era, society faces high demands in work, education, and social interaction, which contribute to a rising prevalence of stress. A survey conducted by Cigna (2021) revealed that 75% of Indonesians experience high levels of stress. This is further supported by WHO reports stating that stress is one of the leading contributors to mental health disorders globally (Ambarwati et al., 2019).

Alongside stress, sleep disorders have also become a widespread health concern and often occur in conjunction with stress. The World Health Organization (2023) reported that poor sleep quality can worsen psychological conditions, reduce productivity, and increase the risk of chronic diseases. Research by Willoughby et al. (2023) shows that people in Asia, including Indonesia, have shorter average sleep durations compared to other regions—about 390 minutes per night. Data from Katadata Insight Center, cited by Annur (2023), indicates that only 34.9% of Indonesians achieve the ideal sleep duration, while the majority sleep just 4 to 6 hours per night. This imbalance between sleep needs and lifestyle realities is a major factor behind the declining sleep quality among people of productive age.

Local findings are equally concerning. According to Riskesdas (2018), 12.11% of the population in West Java experiences emotional mental disorders. In Cirebon Regency alone, the prevalence is 5.73%. A study by Kahfi et al. (2023) found that 93.4% of respondents in West Java reported poor sleep quality, indicating that the issue has become systemic and requires evidence-based intervention.

Various approaches have been developed to address stress and sleep disorders, including non-pharmacological interventions such as physical activity. According to Salahudin and Rusdin (2020), physical activity can enhance the secretion of endorphins and serotonin, which help reduce emotional tension and promote relaxation. Futsal, as a high-intensity sport with strong social engagement, presents an appealing form of physical activity. Rachmayanti (2023) explains that futsal not only improves physical fitness but also offers psychological benefits through social interaction, teamwork, and a fun, competitive atmosphere.

Futsal has also been shown to increase blood flow to the brain and stimulate the release of melatonin—a hormone crucial in regulating circadian

rhythm and sleep quality (Zailia et al., 2024). Additionally, the sport supports the release of neurotransmitters such as dopamine and serotonin, which play roles in enhancing mood and mental calmness. As such, futsal can serve as a promising alternative intervention for individuals facing psychological stress and sleep disturbances.

A preliminary study conducted on the Futsal Community X in Cirebon Regency revealed that most of its members experience high stress levels and poor sleep quality due to work and academic pressures. Respondents reported decreased concentration, emotional instability, and prolonged physical fatigue. These findings highlight the need for scientific efforts to systematically evaluate the effectiveness of futsal as a non-pharmacological intervention in reducing stress and improving sleep quality.

Therefore, this study aims to determine the extent to which futsal can influence the reduction of stress levels and the improvement of sleep quality in individuals of productive age. The results of this research are expected to make a meaningful contribution to the development of nursing practices and public health strategies based on physical activity.

LITERATURE REVIEW

The Effectiveness of Futsal in Reducing Stress Levels

Stress is the body's response to pressure, both physical and psychological, and it is a common issue, especially among people in their productive age (Lazarus & Folkman, 1984). Physical activities such as exercise have been proven to have a relaxing effect and can reduce the levels of cortisol hormone in the body. One sport that stands out in terms of intensity and social interaction is futsal.

According to Zailia et al. (2024), high-intensity sports like futsal stimulate the production of endorphins and serotonin—two hormones closely related to mood regulation and stress reduction. Moreover, social interaction in team sports can reduce social isolation and improve psychological well-being (Inukirana, 2025).

H1 : Futsal is effective in reducing stress levels among members of the Futsal Community X.

The Effectiveness of Futsal in Improving Sleep Quality

Sleep quality is determined by the duration, efficiency, and depth of sleep. One of the main factors that disrupt sleep quality is prolonged stress, which leads to increased sympathetic nervous system activity and reduced melatonin production (Ulum et al., 2022). Futsal can serve as a non-pharmacological solution to address this issue.

Zailia et al. (2024) explain that playing futsal can enhance blood circulation and stimulate the release of melatonin, thereby supporting the regulation of circadian rhythms and creating a bodily condition more conducive to sleep. This physical activity also promotes healthy physical fatigue, which accelerates sleep onset and deepens the slow-wave sleep phase.

H2 : Futsal is effective in improving sleep quality among members of the Futsal Community X.

METHODOLOGY

This study employed a quantitative approach with an experimental design of the one-group pretest-posttest type. This design allows researchers to evaluate changes in stress levels and sleep quality before and after the futsal intervention, without involving a control group. This model is widely used in intervention studies because it can demonstrate the direct effect of a treatment on the same group of subjects (Hastono, 2016).

The population in this study consisted of all active members of the Futsal Community X in Cirebon Regency in 2025. Based on a preliminary study, the total number of members was 30. Since the population is small and fully accessible, a total sampling technique was used, in which the entire population served as the research sample (Pradana & Asmara, 2020).

Data collection was carried out using two questionnaire instruments distributed to respondents before and after the intervention. The first instrument was the Depression Anxiety Stress Scale-42 (DASS-42), used to measure stress levels. DASS-42 consists of 42 items, with 14 items specifically for the stress subscale, and has been internationally validated for reliability and validity (Lovibond & Lovibond, as cited in Putri & Widianti, 2020). The use of this instrument was based on an official license from the Psychology Foundation of Australia for non-commercial research purposes.

The second instrument was the Pittsburgh Sleep Quality Index (PSQI), which assesses sleep quality over the past month and includes seven components: sleep duration, efficiency, disturbances, sleep latency, and others. PSQI has been widely used in recent research and has proven reliable in identifying sleep disorders (Haryanto et al., 2021).

The intervention consisted of futsal sessions conducted over one week, with a frequency of three times and a duration of 60 minutes per session. These sessions were carried out in a structured manner and directly supervised by the researcher. Data collection took place at two time points: before the intervention (pretest) and after the intervention (posttest), using the DASS-42 and PSQI questionnaires.

The collected data were analyzed using SPSS software version 26.0. The Wilcoxon Signed Rank Test was used in this study to analyze the differences in scores before and after the intervention. This test is appropriate for ordinal or interval data that are not normally distributed and for two related data groups (Fitriani et al., 2021).

This study received ethical approval from the Health Research Ethics Committee of the Faculty of Health Sciences, YPIB University of Majalengka, with approval letter number: 012/KEPK/FIKES/YPIB/III/2025. All participants were given a comprehensive explanation regarding the objectives, benefits, procedures, and possible risks of the study. Participation was voluntary and confirmed by signing an informed consent form provided by the researcher.

RESEARCH RESULT

This study was conducted to assess the effectiveness of futsal in reducing stress levels and improving sleep quality among members of the Futsal Community X in Cirebon Regency. The intervention was carried out over one

week, with three sessions, each lasting 60 minutes. A total of 30 respondents participated in the entire series of activities and completed questionnaires both before and after the intervention. Data analysis revealed a significant change in participants' stress levels and sleep quality following the futsal intervention.

Tabel 1. Descriptive Statistics of Stress Levels Before and After the Intervention

Parameter	Before Intervention	After Intervention
Minimum	14	4
Maximum	34	18
Mean	22,43	10,20
Median	22,00	10,00
Standard Deviation	5,11	3,74

The results above indicate a decrease in stress scores following a one-week futsal intervention. Before the intervention, stress scores ranged from 14 to 34, with a mean of 22.43 and a median of 22.00, reflecting moderate to severe stress levels. After the intervention, scores significantly decreased, with a new range of 4 to 18, a reduced mean of 10.20, and a median of 10.00. The decrease in standard deviation from 5.11 to 3.74 also indicates reduced variation in stress levels among participants.

Tabel 2. Descriptive Statistics of Sleep Quality Before and After the Intervention

Parameter	Before Intervention	After Intervention
Minimum	6	2
Maximum	15	9
Mean	9,10	5,20
Median	9,00	5,00
Standard Deviation	2,55	1,81

The results above indicate an improvement in sleep quality following the futsal intervention. Before the intervention, PSQI scores ranged from 6 to 15, with a mean of 9.10 and a median of 9.00, indicating poor sleep quality among most respondents. After the intervention, scores decreased to a range of 2 to 9, with a mean of 5.20 and a median of 5.00, approaching the threshold for good sleep quality. The reduction in standard deviation from 2.55 to 1.81 also suggests that participants' sleep quality became more consistent and generally improved.

Tabel 3. Wilcoxon Test Results for Stress Level and Sleep Quality

Variable	Z	Asymp. Sig. (2-tailed)
Stress Level	-4,782	0,000
Sleep Quality	-4,553	0,000

To ensure the significance of the changes, a Wilcoxon Signed Rank Test was conducted for both variables. The test results showed Z-values of -4.782 for stress level and -4.553 for sleep quality, with significance values (p-values) of 0.000 for both. Since the p-value < 0.05, it can be concluded that there is a

statistically significant difference between the scores before and after the intervention.

Tabel 4. Distribution of Stress Level Categories

Category	Before Intervention	After Intervention
Normal	0	15
Mild	3	9
Moderate	10	5
Severe	12	1
Very Severe	5	0

The results above show the distribution of respondents' stress levels classified into five categories normal, mild, moderate, severe, and very severe—both before and after the futsal intervention.

Before the intervention, none of the respondents fell into the normal category, indicating that all participants experienced a significant level of stress. The majority were in the severe category (40%), followed by moderate (33.3%), very severe (16.7%), and only 10% in the mild category.

After a one-week intervention consisting of three futsal sessions, there was a significant shift in the distribution of stress levels toward milder categories. A total of 15 respondents (50%) fell into the normal category, and 9 respondents (30%) were in the mild category. This means that 80% of the total sample experienced stress levels considered clinically non-disruptive. The number of respondents with moderate stress decreased to 5 people (16.7%), only 1 respondent (3.3%) remained in the severe category, and no participants were categorized as very severe.

Tabel 5. Distribution of Sleep Quality Categories

Category	Before Intervention	After Intervention
Good Sleep (PSQI < 5)	3	18
Poor Sleep (PSQI ≥ 5)	27	12

The results above indicate an improvement in sleep quality following the futsal intervention. Before the intervention, only 3 respondents (10%) had good sleep quality (PSQI score < 5), while 27 respondents (90%) were categorized as having poor sleep quality (PSQI score ≥ 5). After the intervention, the number of respondents with good sleep quality increased to 18 (60%), while only 12 respondents (40%) remained in the poor sleep category.

Tabel 6. Summary of the Effectiveness of the Futsal Intervention

Variable	Intervention Effect	Statistical Significance
Stress Level	Significant Decrease	Yes (p = 0,000)
Sleep Quality	Significant Increase	Yes (p = 0,000)

Based on the table above, the final results summarize the effectiveness of the futsal intervention on two main variables: stress level and sleep quality. The results indicate that both variables underwent statistically significant changes, with a p-value of 0.000. Stress levels showed a significant decrease, while sleep

quality demonstrated a significant improvement after the one-week futsal intervention.

DISCUSSION

The findings of this study demonstrate that a one-week futsal intervention, conducted over three sessions, had a significant impact on reducing stress levels and improving sleep quality among members of the Futsal Community X in Cirebon Regency. These results reinforce the growing body of evidence that physical activity plays a crucial role in regulating both psychological and physiological conditions.

Specifically, the average stress score decreased from 22.43 to 10.20. The Wilcoxon Signed Rank Test revealed a statistically significant difference, with a p-value of 0.000, indicating that the reduction in stress levels was not due to chance. This finding aligns with the research of Salahudin and Rusdin (2020), who reported that physical activity triggers the release of endorphins and activates the parasympathetic nervous system, both of which help to reduce emotional tension and stabilize mood. Additionally, cortisol—the body's primary stress hormone—has been shown to decrease through regular exercise. These results are further supported by Rachmayanti (2023), who noted that futsal, a moderate to high-intensity sport, offers dual benefits: it enhances physical fitness while also promoting positive social interaction through teamwork, communication, and healthy competition. Such interactions foster a sense of connection and social support among players—factors that have been identified as protective against chronic stress (Willoughby et al., 2023).

Beyond stress reduction, the study also recorded a notable improvement in sleep quality. The average PSQI score dropped from 9.10 to 5.20 following the intervention. Prior to the intervention, 90% of participants were classified as having poor sleep quality. After the futsal sessions, 60% of them transitioned into the "good sleep" category. This change suggests that futsal positively affects not only psychological aspects but also biological functions such as sleep regulation. Physical activity is known to support circadian rhythm balance and enhance melatonin production, which are critical for sleep initiation and maintenance (Zailia et al., 2024). Other studies have shown that exercise contributes to better sleep by lowering core body temperature post-activity, triggering sensations of drowsiness and relaxation (Haryanto et al., 2021).

The effectiveness of such a short-term intervention highlights futsal as a practical, cost-effective, and easily implemented non-pharmacological strategy at the community level. These findings have significant implications for public health practice, particularly in promotive and preventive care. Health professionals, including community nurses and health promoters, can adopt futsal as an intervention program aimed at working-age populations, who are particularly vulnerable to stress and sleep disturbances.

Conceptually, this study supports the bio-psycho-social model in addressing mental health and sleep issues. Compared to pharmacological therapies—which carry risks of side effects and dependency—physical activities

like futsal stimulate natural biological systems while simultaneously reinforcing psychosocial well-being.

However, the study does have limitations. The short duration of the intervention (one week) restricts the ability to generalize long-term outcomes. Longitudinal studies are needed to assess the sustained benefits of futsal in managing stress and improving sleep quality over extended periods. Furthermore, external variables such as diet, caffeine intake, and academic or work-related pressures were not tightly controlled, potentially influencing the results.

In conclusion, this study presents futsal as a promising physical activity-based intervention for enhancing mental health and sleep quality. On a broader scale, futsal can be integrated into public health programs aimed at improving quality of life, reducing the burden of mental health disorders, and strengthening the role of community-based initiatives in fostering healthy, active, and supportive environments.

CONCLUSIONS AND RECOMMENDATIONS

This study demonstrates that a one-week futsal program, held three times over the course of the week, effectively reduced stress levels and improved sleep quality among members of Futsal Community X in Cirebon Regency. These findings reaffirm the important role of physical activity in regulating psychological states and biological rhythms. They also support previous theories stating that exercise can improve emotional well-being and sleep function through neurophysiological mechanisms (Salahudin & Rusdin, 2020; Zailia et al., 2024).

Thus, this research contributes scientifically to the strengthening of physical activity-based non-pharmacological approaches as effective interventions for managing stress and sleep disorders among individuals in the productive age group. Additionally, it expands the empirical literature relevant to the fields of community nursing and public health promotion.

Based on the results of this study, it is recommended that futsal be utilized as part of community intervention programs aimed at reducing stress and improving sleep quality particularly for individuals experiencing psychological pressure due to work or academic demands.

Future research should consider extending the duration of the intervention and including additional variables such as daily activity levels, dietary patterns, and environmental factors. This would allow for a more comprehensive understanding of the long-term effectiveness of exercise on mental health and sleep.

Furthermore, the development of collaborative efforts between healthcare professionals and sports communities can serve as a strategic approach to fostering socially supportive environments that enhance psychological well-being across society.

ADVANCED RESEARCH

This research can be further developed by employing a quasi-experimental design involving a control group to compare the effectiveness of futsal with other forms of physical activity such as jogging or yoga. Future

studies could also focus on identifying the ideal frequency and duration of futsal sessions that yield the most significant impact on stress reduction and sleep quality. Longitudinal studies are recommended to assess the long-term effects of futsal on emotional balance and sleep patterns. Incorporating additional variables such as resilience, emotional intelligence, and coping strategies would enrich the analysis and provide a more holistic understanding of the outcomes. A qualitative approach is also encouraged to explore participants' subjective experiences with futsal as part of their stress management strategies. Comparative studies based on gender or geographic location, as well as combining futsal with other interventions like mindfulness, would further broaden the scope and scientific contribution of this research—particularly in the fields of nursing and mental health.

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