Original Research

The Effect of Mindfulness Practices on the Athletes' Sleep Quality and Psychological Well-being in the Conditions of the Corona Pandemic

Amir Hamzeh Sabzi[1*], Farnaz Torabi[2], Annaghorban Najjari[3]

1. Assistant Professor, Physical Education Department, Payam Noor University, Tehran, Iran.

2. Associated Professor, Physical Education Department, Payam Noor University, Tehran, Iran.

3. Msc, Physical Education Department, Payam Noor University, Tehran, Iran.

Corresponding Author: Amir Hamzeh Sabzi. Assistant Professor, physical education department, Payam Noor University, Tehran, Iran. **Email:** Ah.sabzi@pnu.ac.ir

Abstract

Background: Mindfulness-based interventions are considered as one of the third generation or third wave cognitive-behavioral therapies. Mindfulness is a form of meditation that is rooted in Eastern religious teachings and rituals, especially Buddha. The purpose of the present study was to investigate the effect of the mindfulness practice program on the sleep quality and psychological well-being among male athletes in the city of Gonbad in the conditions of the Corona pandemic.

Method: This is a quasi-experimental study with the pretest, post-test and control Group. For this purpose, 24 subjects were selected by convenient method and were randomly divided into two experimental and control groups (12 subjects in each group) and participated in the research design which had been conducted by pre-test and post-test design. The training program included mindfulness practices for 8 weeks that the experimental group did them for 1 session per week.

Results: The results showed that there is a significant difference between the two experimental and control groups in terms of sleep quality and psychological well-being, therefore the sleep quality and psychological well-being in the experimental group were better than those of control group.

Conclusion: In general, the results of the research show that the mindfulness practice program in the conditions of the Corona pandemic can increase and improve the sleep quality and psychological well-being among athletes.

Keywords: Mindfulness, Sleep Quality, Psychological Well-Being, Athletes, Pandemic.

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Introduction

From December 18 to December 29, 2019, five patients were hospitalized with symptoms of acute respiratory syndrome that one of whom died (1). Until January 2, 2020, the results of the Covid-19 test of forty-one hospitalized patients were declared positive that about half of these patients had diabetes, high blood pressure, and cardiovascular diseases (2). On January 30, the World Health Organization declared the outbreak of Covid-19 as a serious health risk (3). On February, this virus was spread in most parts of the world.

The corona pandemic has endangered people's physical health and performance, as well as their mental health and well-being, and this chaotic situation has a great effect on the way people perceive the world and their daily lives (4). Many countries were forced to use quarantine and impose restrictions in which the freedom of movement was restricted for all of people and eventually public centers, sports venues and important events such as sports competitions at various levels, even the 2020 Olympics, were closed in different parts of the world, and for this reason, the athletes were also quarantined in their homes. Staying away from sports may create a significant risk for athletes' mental health, and it is expected that athletes' negative interpretation of the weakening of their bodies and sports abilities will be so stressful (5). Since the improvement of psychological factors in the domain of sports, which is the key to success in performing sports skills, has strongly relied on the improvement of the athlete's sports skills (6). Athletes use several protocols to improve mental skills. One of the ways to optimize mental skills and coping behaviors in athletes is mindfulness. Mindfulness refers to a person's ability to pay attention to present practices without judgment, and is a systematic and intensive approach to relaxation, attention, awareness, and insight that has been introduced as a non-judgmental method to help people overcome unpleasant experiences (7). Mindfulness requires the development of the three qualities of refraining from judgment, intentional awareness, and focusing on the present moment in the individual's attention which attention focused on the present moment causes the processing of all aspects of immediate experience, including cognitive, physiological, or behavioral activities. With the help of practice and techniques based on mindfulness, a person becomes aware of his daily activities, of the automatic functioning of the mind in the past and future world, and through moment-to-moment awareness of his thoughts and feelings and Physical states gain control over them and are freed from the everyday and automatic mind focused on the past and future (8). Williams et al. (2001), state that mindfulness can be effective as it addresses both the physiological and cognitive aspects of stress and teaches new methods of thinking about stressful situations and its management. Recent studies in psychology and neuroscience have shown that mindfulness training reduces stress and anxiety in people (9). In this regard, Vidich et al. (10) found that mindfulness training increases sports coping skills by reducing perceived stress. Also, many researches show a negative relationship between mindfulness and the experiences related to the anxiety and stress (11, 12). Theoretically, it has been suggested that mindfulness training can increase attention control, emotion regulation, and self-awareness (13).

Sleep disorder is a common health complaint that affects about 10-25% of the total population (14). Lack of sleep to the high rate, can increase the risk of mood and anxiety disorders, cognitive impairment, and various medical conditions, including cardiovascular diseases and obesity (15). Sleeping pills are still the first recommended treatment for insomnia. Although these drugs are effective, they may pave the way for abuse taking, creating mutual drug interactions and side effects including memory loss, abnormal thoughts, behavioral changes and headaches (16). In recent years, mindfulness has underscored as an alternative treatment for sleep disorders. Mindfulness is hypothesized to target multiple

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cognitive and emotional processes that contribute to poor sleep quality. In this regard, it has been shown that mindfulness reduces ruminative thoughts and emotional reactions (17) and causes an unbiased reappraisal of salient experiences; which all in all may facilitate sleep (18). Many researches in this field have shown that mindfulness techniques and practices have positive effects on people's sleep quality and improve it (6, 19). The mechanisms of sleep hygiene that are probably related to psychological well-being are unknown, but evidence has shown that psychological pressure and stress mediate the relationship between sleep and psychological well-being (8). Psychological well-being is defined as healthy living and realizing one's potential and refers to what a person needs for well-being. According to a general agreement, psychological well-being is multidimensional and has six components, including: self-acceptance (positive evaluations of self and past life), personal growth (feeling of ongoing growth and development in life), autonomy (feeling of self-determination), environmental mastery (the ability to effectively manage life and the outside world), positive relationships (having high quality interpersonal relationships with others) and having goal in life (believing that life is meaningful). Each of these dimension express different challenges that realize by people's efforts for reaching psychological well-being and are vital for human psychological growth and development (20).

Multifarious studies have shown that mindfulness has a positive relationship with mental health and psychological well-being (6, 21). By increasing mindfulness, our ability in states such as anxiety increases and we can use the information obtained from these states and thereby increase our psychological well-being (22). Moreover, according to the researches, mindfulness improves psychological well-being by improving sleep quality and reducing anxiety and stress (6, 23); And it has been shown that there is a positive relationship between all dimensions of psychological well-being and the total score of mindfulness; in a way that increasing mindfulness is associated with increasing psychological well-being (24). Therefore, considering the effectiveness of mindfulness practices on cognitive components and with regard to the quarantine and the special conditions of the Corona pandemic and the possible cognitive consequences resulting from it on athletes, the purpose of this research is to answer the question whether mindfulness practices is effective on sleep quality and the psychological well-being of athletes in quarantine condition and deprivation of their main and professional training due to the closure or restriction of activities in sports facilities or not?

Methods

The current research is semi-experimental and applied type and has pre-test and post-test design including two experimental and control groups that in terms of data collection, the field method was used. The statistical population consisted of semi-professional male athletes (those who had no experience of playing in the league and had a maximum of 5 years of experience) who were members of the football and futsal clubs of Gonbad city, their main and professional training had been limited or stopped due to the circumstances caused by the corona pandemic through the closing or restriction of activities in sports facilities. Among them 24 athletes from these subjects with the age range of 18 to 25 years were selected as samples. The sample selection was convenience sample that were randomly placed in two experimental and control groups (12 subjects in each group). The inclusion criteria of the study were as follows: 1- the professional training and competitions of individuals have been limited or stopped due to the situation caused by Corona. 2- All participants should attend the online classes on time. 3- individuals should have physical and mental health. 4- The participants should not take any sedative or psychoactive medications. And the exclusion criteria included 1- unwillingness to continue cooperation and 2-

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not filling the questionnaires completely. The following questionnaires were used for collecting data.

Pittsburgh Sleep Quality Index (PSQI): In this study, sleep quality was measured by using the Pittsburgh Sleep Quality Index (PSQI). This questionnaire actually has 9 items, but because question 5 contains 10 sub-items, the total questionnaire has19 items, which are scored on a 4-point Likert scale from 0 to 3. This questionnaire has 7 subscales, which are as follows: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications, daytime dysfunction. Its validity and reliability have been confirmed in numerous studies (25, 26).

Psychological Well-Being scales (PWBS-18) is a version of 18 questions: This scale was designed by Ryff in 1989 and revised in 2002. This questionnaire has 18 questions and 6 subscales (each 3 questions measures one factor) as self-acceptance, environmental mastery, positive relationships with others, autonomy, personal growth and having goal in life. Questions are scored based on a 6-point Likert scale. The validity and reliability of this questionnaire has been confirmed (27).

In the research implementation stage, at first the conditions of the research and how to complete the questionnaires for the people who had been selected as samples were described, and after gaining the consent of the athletes and dividing them randomly into two experimental and control groups, the research entered to implementation stage. At this stage, in order to collect data, at first a pre-test deign was implemented; In a way that, the Pittsburgh Sleep Quality Index (PSQI) and the Psychological Well-Being scale (PWBS-18) were presented to people in an online way for completing them and were completed by them. Then mindfulness practices were held for eight weeks for the experimental group, one session a week and each session was 90 minutes through online and video. The practice program was similar to the methods presented in the mindfulness-based stress reduction program of John Kabat-Zinn (2013); including the technique of eating meditation, breathing meditation, body scan meditation, mindful sitting, mindful walking, muscle relaxation exercise, seeing and hearing exercise, sleep hygiene, three-minute breathing space exercise, mindfulness of thoughts, four-dimensional meditation and presenting homework (28). Thus, in the first session, the concept and basic principles of mindfulness were explained and general information about the framework of mindfulness interventions and the regulations governing the group were provided to them. At the beginning of each session, following the review of the previous session and feedback from last week, new techniques were taught by an experienced trainer (Table 1). After the end of the intervention sessions, sleep quality and psychological well-being questionnaires were presented as a post-test and completed by participants. It should be noted that with regard to the circumstances, it was not possible to present the sessions and measure the necessary indicators in person; Therefore, the desired mindfulness sessions were presented in an online way to the experimental group, and the questionnaires were sent to all the participants in the form of an internet link at a determinate time (both in the pre-test and post-test) for completing them.

After collecting the data, in order to analyze this information, at first descriptive statistics were used to categorize the data. The Shapiro-Wilk test was used to check the normality of the data distribution and the one-way covariance analysis test was used to check the effect of training. SPSS version 22 software was used for data analysis.

Results

It shows the descriptive statistics of the research variables and the summary of the covariance analysis results for analyzing the effect of the independent variable on the dependent variables. In order to perform inter-group comparisons, the assumptions of using covariance analysis (normality of data distribution, homogeneity of variances, linearity of dependent variable

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relationship and homogeneity of variance and covariance of regression slopes) were examined. The results of the Shapiro-Wilk test showed that the distribution of data related to sleep quality and psychological well-being has a normal distribution. After examining the assumptions of the covariance analysis test, two series of covariance analysis were used for intergroup comparisons, in which the group variable (experimental/control) was used as the independent variable, sleep quality and psychological well-being as dependent variables, and the pre-test values of the variables as the control variable (also covariance) was considered. The results of these analyzes are presented in Table 2.

The results of the research on sleep quality showed that after controlling the effect of the pre-test, the effect of the group on sleep quality is statistically significant ($P < 0.001$, $F1.27 = 0.07$), which means that there was a significant difference in the post-test in the sleep quality between the two experimental groups and control. Regarding psychological well-being, it showed that after controlling the effect of the pre-test, the effect of the group on psychological well-being is statistically significant ($P<0.001$, $F1.27= 7.823$), which means that there was a significant difference in the post-test in psychological well-being between the two experimental and control groups. According to the average values of the groups in the post-test (Table 1), it can be concluded that the scores of sleep quality and psychological well-being in the experimental group are significantly higher than the control group. In other words, mindfulness practices have had a significant impact on the athletes' sleep quality and psychological well-being. Moreover, eta square indicates that 35.4% of the increase in sleep quality and 38.2% of psychological well-being in athletes was due to the effect of mindfulness practices.

Discussion

The purpose of this research was to investigate the effect of mindfulness practices on stress, sleep quality and psychological well-being of athletes in the conditions of the Corona epidemic. The findings indicated a significant effect of mental practices on the sleep quality of athletes in the conditions of the corona pandemic. This finding is consistent with the results of Morton et al. (29), Jones et al. (6), Lee et al. (30), and Mahdian et al. (31). In its explanation, it can be said that mindfulness training teaches people how to get rid of habitual skills and change the direction of information processing resources by focusing on breathing. Therefore, in mindfulness training, a person learns to stop trying to control sleep and communicate with his thoughts and feelings in a different way (6). People who have poor sleep quality tend to attribute any problem to sleep, including feeling tired, lassitude, decreased performance, and mood disorders. Mindfulness increases attention to signs of fatigue and decreased performance related to sleepiness. In general, it can be said that the basis of cognitive therapy based on mindfulness is finding the presence of the mind in every moment, preventing from mental ruminations, controlling over daily events, re-exploring patterns of automatic thoughts along with focusing on breathing, more concentration and integration, paying attention to defective cognitions and the use of accepting and confronting thoughts. This method leads to improve sleep by focusing on the main root of insomnia (31). Segal et al. (2002) describe that removing defective behaviors such as being conditioned to a specific environment for sleeping or sleeping time is one of the most sensitive components in the treatment of sleep problems. In the state of conscious attention that we achieve it during the treatment, the information obtained from defective experiences turns towards the current experience (32). In fact, cognitive therapy based on mindfulness helps a person to gain awareness of the use of repetitive cognitive patterns when confronting sleep-related thoughts and emotions that lead to stress and emotional disturbance. Therefore, by participating in mindfulness therapy sessions, people get the

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necessary training in the field of changing negative attitudes towards sleep and learn how to become less involved in disturbing and ruminative thoughts in order to reduce anxiety and depression and thus their mental health will increase (32).

Other findings showed that mindfulness practices improved the athletes' psychological well-being in the conditions of the corona pandemic. In the explanation of this finding, it can be said that because mindfulness paves the way for moderating emotions without judgment and increasing awareness of psychological feelings, especially negative feelings, and helps seeing and accepting feelings and physical emotions clearly as it happens, so it can play a role in psychological well-being. Mindfulness therapy leads to positive behaviors related to health by moderating negative behavior and thoughts because one of the important aspects of mindfulness-based therapy is that people learn to deal with negative emotions and thoughts and to experience mental events positively (8). Numerous studies show that increasing mindfulness increases people's psychological well-being. Because mindfulness gives clarity to experiences and teaches people to experience their lives moment by moment. This reduces negative psychological symptoms and increases psychological well-being (8). Brown and Ryan (2003) believe that doing mindfulness practices as observing, being non-judgmental, and being non-reactive causes taking action to be occurred with awareness at the same time. The growth of these factors also improves psychological well-being and reduces stress and psychological symptoms. In fact, when mindfulness increases, person's ability for observing states such as anxiety increases, and as a result, the person can free himself from automatic behavior patterns and should not be controlled through understanding and re-accepting other states such as anxiety and fear but he should use the information about these states and be accompanied with his own emotions, and as a result, psychological well-being will increase. Mindfulness is a non-judgmental and indescribable present-based awareness of an experience that is within the scope of a person's attention at a particular moment, and in addition, this concept includes acknowledging the said experience and accepting it and increasing mindfulness is effective in increasing social and psychological well-being according to the components of acceptance, comprehensibility and personal growth, and it allows a person to react to events thoughtfully and reflectively instead of reacting thoughtlessly and make them more capable in recognizing, managing and solving everyday problems (8). According to Siegel (2010), mindfulness can be described as a way of being or a way of understanding that requires understanding personal feelings. Mindfulness is a way for connecting to life in a better manner, which can relieve physical pain and give life more richness and meaning. In fact, this action is done by aligning with moment-to-moment experiences and providing direct insight into the role of the mind in creating unreasonable anxieties in mindfulness (20); It also makes people aware of their defective thoughts and re-directs their thoughts to other aspects of the present, such as breathing, walking with the presence of mind or environmental sounds.

These positive changes in people increase overall well-being. Basically, in terms of theoretically, the mind can sometimes increase the preventive effect of treatment, and it can increase the preventive aspect of treatment by changing defective thinking patterns and training attention control skills (15). With regard to the role of mindfulness in the treatment of psychological problems, on the one hand, it is associated with increasing positive indicators such as self-esteem, happiness, and contentment, which are the basis of psychological well-being test items. Mindfulness training increases a person's attention and awareness towards physical and mental feelings and leads to a feeling of trust in life, compassion, and true acceptance of life events, because one of the important aspects of mindfulness-based education is that people learn to deal with negative emotions

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and thoughts and experience mental events in a positive way. The results of the present study demonstrate that the psychological well-being of people can be improved by training based on mindfulness.

Conclusion

The results of this research show that mindfulness-based practices have been effective in improving the sleep quality and psychological well-being of male football players in the conditions of the Corona pandemic. The conscious mind enables a person to be aware of all aspects of experience, bodily sensations, feelings, thoughts, seeing, smelling, hearing, touching and tasting. The most important goal of the program based on mindfulness is to learn how to recognize the two mindsets of being and doing in life. In a way that a person knows when to move from doing toward being. Being allows for the possibility that thoughts do not necessarily reflect reality but are merely mental events. By practicing seeing yourself separate from thoughts, you can overcome failures, ineffective thoughts and beliefs and improve self-efficacy and psychological well-being in life. Moreover, mindfulness allows us to be completely in the present moment with our experience. Surprisingly, this simple transition can open a new and better path in life for human.

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Authors Contributions:

All authors contributed toward data analysis, drafting and revising the paper and agreed to be responsible for all the aspects of this work.

Ethical Considerations

In order to observe ethical considerations, the subjects were fully informed about the goals of the research; while obtaining written consent, they were assured that the information obtained from the study would remain confidential. They were also assured that their participation do not involve any losses in the research, and those who did not want to continue to cooperate were free to leave the study.

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Tables

Table 1. Mindfulness sessions program

Sessions	sessions descriptions
The First	getting familiar to each other and the numbers of meetings, explaining the principles and rules governing the group, explaining the automatic guidance system and mindfulness training, the technique of eating raisins, body scanning meditation with breathing for 30 minutes and paying attention to a part of the body each time, homework (attending the moment and practicing eating and body scanning techniques at home while performing daily activities)
The Second	Performing body scan meditation and discussion about this experience, discussion about homework, obstacles of practice and mindfulness solutions for this issue, discussion about the difference between thoughts and feelings, sitting mindfully, homework (sitting meditation along with body scan and mindfulness of a daily activity)
The Third	Reviewing the previous session, practicing seeing and hearing (looking and listening non-judgmentally for 2 minutes), walking mindfully, breathing space practice in three stages for three minutes (paying attention to the practice at the moment of doing it, paying attention to breathing and to the body), homework (sitting meditation, body scan, breathing space exercise in a pleasant event for three minutes, mindfulness of a new daily activity)
The Fourth	Reviewing the previous session, four-dimensional meditation (mindful sitting along with paying attention to breathing, body sounds and thoughts), discussion about stress responses and reactions to difficult situations and alternative attitudes and behaviors, breathing meditation, homework (Sitting meditation, scanning one of the conscious body movements, practicing breathing space in an unpleasant event for three minutes, mindfulness of a daily activity)
The Fifth	Reviewing the previous session, sitting mindfully, presenting and performing mindful body movements, mindfulness of thoughts, homework (sitting meditation, body scan, breathing space practice for three minutes, mindfulness of an unpleasant event)
The Sixth	Reviewing the previous session, muscle relaxation practice, breathing space practice for three minutes, discussion about homework, presenting four meditation practices successively, homework (selecting and performing combination of meditations according to the individual's preference, practicing breathing space in an unpleasant event for three minutes, mindfulness of a daily activity)
The Seventh	Reviewing past assignments, sleep hygiene, four-dimensional meditation and awareness of everything that enters the consciousness at the moment with the theme that what is the best way to take care of myself?, teaching acceptance without judgment, homework (selecting and performing combination of meditations according to the individual's preference, practicing breathing space in an unpleasant event for three minutes, mindfulness of a daily activity)
The Eighth	Performing body scan meditation, using what they have learned so far, practicing breathing space for three minutes, discussion about coping methods for removing obstacles to meditation, summing up the sessions.

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Table 2. Descriptive indices of sleep quality and psychological well-being variables in the pre-test and post-test stages, separated into two experimental groups (n=12) and control (n=12)

Variables	Stage	Experimental	Control	F	P	$^2\eta$
		Mean ± SD	Mean ± SD			
Sleep quality	Pre-test	±2.55 13.11	±2.85 12.83	90.53	0.001	0.354
	Post-test	±1.71 9.25	±2.23 13.08	38.52	0.001	
Psychological well-being	Pre-test	±2.76 73.75	±2.75 72.33	55.72	0.001	0.382
	Post-test	±3.15 79.25	±2.56 71.75	104.68	0.001	

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