



Evaluating the Effect of Yogic Intervention on Psychological Distress Among Injured Athletes

Sonu Kumar^{1ABCDE}, Meenakshi Saraf Kalyani^{1ABCDE}, Mukul Pant^{1ACDE},
Anuja Rawat^{1ABCDE}, Hiralal Yadav^{1ABCDE} and Dessalegn Wase Mola^{2ACDE}

¹Hemvati Nandan Bahuguna Garhwal University

²Ambo University

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Corresponding Author: Dessalegn Wase Mola, e-mail: dessalegn.wasie@gmail.com

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Abstract

Background. Injured athletes often face psychological distress, including symptoms of depression, anxiety, and stress, which can hinder their recovery. Addressing mental well-being is essential for holistic rehabilitation.

Objectives. This study aimed to evaluate the effectiveness of a structured yogic intervention, comprising practices of Yoga Nidra (yogic sleep) and Nadi Shodhana Pranayama (alternate nostril breathing), in reducing psychological distress among chronically injured athletes.

Materials and methods. Forty athletes with long-term injuries, aged 19 to 26, from Hemvati Nandan Bahuguna Garhwal University in Uttarakhand, were randomly divided into two groups of 20, with equal numbers of men and women in each group: one group received the treatment and the other did not. The 21-item Depression, Anxiety, and Stress Scale (DASS-21) was implemented to measure psychological discomfort. Before the intervention, both groups took a pre-test. The Experimental group received a yogic intervention for six weeks (30 minutes/day, five days/week), while the Control group underwent no intervention. A post-test was conducted for both groups after the intervention period. Paired t-tests and independent t-tests were used to analyze within-group and between-group differences, respectively.

Results. The Experimental group showed significant improvement in depression ($t = 6.65, p < .001$), anxiety ($t = 5.07, p < .001$), and stress ($t = 5.72, p < .001$) from pre- to post-test. No substantial changes were observed in the Control group. Post-test comparisons revealed marked enhancements in all variables in the Experimental group compared to the Control group.

Conclusions. According to the findings of this study, the structured yogic intervention significantly reduced psychological distress in injured athletes, suggesting its effectiveness as a complementary strategy in the rehabilitation process. Yoga Nidra and Nadi Shodhana Pranayama may aid in promoting faster and more effective recovery by improving mental well-being.

Keywords: depression, anxiety, stress, yoga, injured athletes, rehabilitation and psychological distress.

Introduction

Injuries commonly present a challenge for college athletes, with almost 90% sustaining at least one sport-related injury during their athletic careers (Sullivan et al., 2022). A sports-related injury denotes any physical damage incurred by an athlete due to involvement in sports, either during practice or competition (Marconcin et al., 2023).

These injuries, varying from small strains to serious traumas, often need players to temporarily stop from their activity, irrespective of the need for medical assistance. In addition to the physical consequences, such injuries may have significant psychological impacts, resulting in heightened life stress, fear of reinjury, and other adverse emotional reactions, including anxiety, despair, and frustration. These psychological variables may substantially impede the rehabilitation process and hamper an athlete's reintegration into sport (Santi & Pietrantonio, 2013).

Psychological Distress Resulting from Injuries: – Psychological distress encompasses a range of mental health

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issues, from mild, subclinical symptoms to clinically diagnosed conditions, including depression, anxiety, and stress disorders. Increased levels of distress are commonly correlated with impaired mental health and are often associated with prevalent mental disorders such as anxiety and depression. Studies have consistently demonstrated a correlation between various types of psychological distress and numerous adverse physical health outcomes (Zhu et al., 2022). Athletes, contrary to common assumptions, experience mental health challenges. Injuries incurred during sports participation exhibit a dual association with psychological distress; injuries may result in emotional challenges, while pre-existing mental distress can heighten the probability or severity of injuries. This dynamic establishes a complex psychological environment for athletes, who encounter various stressors, including general life pressures and sport-specific challenges, such as the frequency and severity of injuries (Haugen, 2022).

Psychological distress, which encompasses symptoms of stress, anxiety, and depression, is often assessed via the use of validated and standardised questionnaires. According to studies, athletes who suffer injuries often report far greater levels of psychological discomfort than those who do not. According to Appaneal et al. (2009), depression is one of the most prevalent emotional responses to injury. With around 34% of professional athletes reporting symptoms of depression, this mental health issue is noticeably prevalent in sports communities (Hammond et al., 2013). According to Wolanin et al. (2016), 6.3% of college athletes had moderate to severe depression symptoms, while 23.7% of them had symptoms at clinically significant levels.

There is increasing acknowledgment that psychological factors especially stress and anxiety significantly influence how often injuries occur, how severe they are, and how long they last. Sustaining an injury can lead to a variety of emotional reactions, such as anger, frustration, fear, and a reduced sense of self-esteem. Worries related to the recovery process, the possibility of getting injured again, and uncertainty about future performance can further intensify psychological strain. The Anderson and Williams model highlights how anxiety, depression, anger, negative mood states, and competitive anxiety influence both the likelihood and severity of injuries (Pal et al., 2021). By enhancing core stability, flexibility, and range of motion, yoga not only lowers the risk of injury but also fosters relaxation and mental resilience, effectively addressing both physical and psychological stressors (Krishnamurthy, 2023). Additionally, disruptions in athletic participation frequently lead to mood problems and feelings of isolation, illustrating the need for a holistic rehabilitation strategy that addresses both the physical and psychological challenges of recovery (Santi & Pietrantonio, 2013).

Yoga lowers two main risk factors for sports-related injuries: perceived vulnerability and generalised weariness. Many sports, including baseball, winter sports, swimming, handball, and soccer, may gain by introducing yoga into their performance tactics. Regular use of pranayama methods with traditional training in football has been shown to greatly increase lung function, hence improving respiratory efficiency and general athletic performance (Bucea-Manea-Toniş et al., 2024). Yoga also raises thalamic GABA levels during a 12-week period, so enhancing mood and lowering anxiety via boosting cerebral blood flow in the prefrontal cortex, hence activating the reticular nucleus of the thalamus. While lowering norepi-

nephrine levels, which helps to reduce stress as shown in heart failure patients, yoga also raises serotonin levels and elevates dopamine in the ventral striatum, hence fostering emotional well-being (Nourollahimoghadam et al., 2021).

Numerous studies have demonstrated that yoga can effectively reduce symptoms of depression (Bridges & Sharma, 2017) and alleviate anxiety by emphasizing breath control techniques, addressing the well-established connection between anxiety and dysfunctional breathing patterns (Lee et al., 2024). Both Mola et al. (2025) and Mola and Adane (2020) emphasized the importance of incorporating scientifically structured training regimens into athletic programs, particularly in events like the long jump, where evidence-based approaches are essential for maximizing performance and potential. In this context, the present study integrated Yoga Nidra and Nadi Shodhana Pranayama as interventions for injured athletes. These yogic practices promote deep relaxation, reduce stress, and help regulate the autonomic nervous system, thereby supporting the management of anxiety, depression, and overall psychological well-being. This research aims to evaluate the effectiveness of these yogic interventions in reducing psychological distress among injured athletes and to contribute to the development of more holistic, athlete-centered approaches to injury rehabilitation.

Materials and Methods

Study Design and Participants

This study employed an experimental research design to evaluate the effects of a scientifically based training program on the psychological distress of injured athletes, specifically examining its influence on anxiety, depression, and overall mental well-being throughout the recovery process. This research investigates the potential advantages of integrating yoga into rehabilitation programs, aiming to enhance the development of holistic, athlete-centered strategies for injury recovery and to promote the psychological well-being of injured athletes. Forty chronically injured athletes, comprising both males and females from diverse individual and team sports, who participated in interuniversity competitions at Hemvati Nandan Bahuguna Garhwal University in Srinagar, Uttarakhand, were selected for this study. The participants, aged 19 to 26 years, were randomly assigned to two equal groups: an experimental group ($n = 20$) and a control group ($n = 20$), with a balanced distribution of male and female athletes in both groups. Selection criteria encompassed athletes who demonstrated physical fitness for participation, notwithstanding their injuries, and who were free from acute psychological conditions. All participants provided informed consent prior to the commencement of the study, ensuring voluntary participation and a comprehensive understanding of the research procedures. In the course of the study, the prioritisation of privacy, confidentiality, and participant safety was emphasised.

Psychological Tool

Data was collected using the pre-established and validated Depression Anxiety Stress Scale (DASS-21) to evaluate levels of depression, anxiety, and stress in injured athletes. The DASS-21, created by Lovibond and Lovibond in

Table 1. Demographic characteristics of the initially randomized sample (Mean ± SD)

No	Baseline characteristics	Experimental Group (n = 20) Mean ± SD	Control Group (n = 20) Mean ± SD
1	Age (yrs.)	21.40 ± 1.47	21.80 ± 1.15
2	Weight (kg)	55.70 ± 6.08	56.90 ± 6.99
3	Height (m)	158.45 ± 8.14	154.90 ± 7.55
4	BMI (kg/m ²)	22.16 ± 1.43	23.65 ± 1.54

1995, has 21 measures that assess three domains: Depression (7 items), Anxiety (7 items), and Stress (7 items). Responses are evaluated on a 4-point scale, from 0 (“did not apply to me at all”) to 3 (“applied to me very much or most of the time”). The scale’s validity and reliability have been established, with Cronbach’s alpha values of 0.70 for depression, 0.66 for anxiety, and 0.76 for stress, demonstrating robust reliability and validity, as shown by Wittayapun (2023).

Yogic Intervention

Subsequent to the pre-test, the experimental group engaged in a systematic yoga intervention including Yoga Nidra and Nadi Shodhana Pranayama. A certified yoga instructor conducted this intervention for 30 minutes per day, five days a week, over a period of six weeks. Yoga Nidra, renowned for inducing profound relaxation and mitigating stress, was combined with Nadi Shodhana Pranayama, which aids in harmonising the neurological system and enhancing mental clarity. Concurrently, the control group refrained from participating in any designated yoga sessions and maintained their standard rehabilitation regimen. Upon completion of the six-week duration, both groups participated in a post-test. The DASS-21 psychological scale was used in pre- and post-tests to assess the levels of depression, anxiety, and stress in both the experimental and control groups before and after the intervention.

Statistical Analysis

Subsequently the pre-test, the experimental group took part in a methodical yoga program including Nadi Shodhana Pranayama and Yoga Nidra. Over a six-week period, a certified yoga instructor ran this program daily for 30 minutes, five days a week. Renowned for its deep relaxation and stress reduction, Yoga Nidra was paired with Nadi Shodhana Pranayama, which helps to harmonise the neurological system and improve mental clarity. At the same time, the control group kept their usual rehabilitation schedule and skipped any scheduled yoga classes. Both groups took part in a post-test after the six-week period. Pre- and post-tests using the DASS-21 psychological scale measured the degrees of sadness, anxiety, and stress in the experimental and control groups both before and after the intervention.

Result

Table 2 show that the descriptive statistics , in cluding the mean , standard deviation, standard error of the mean, for variables evaluated in the both the experimental and control groups at pre-test and post-test stages.

Table 2. Summary of descriptive statistics for variables measured in the experimental and control groups before and after the intervention (pre-test and post-test)

Variables	Group	Test	n	Mean	SD	Std. Error Mean
Depression	EG	Pre-test	20	22.10	9.92	2.22
		Post-test	20	14.40	8.00	1.79
	CG	Pre-test	20	16.10	9.57	2.14
		Post-test	20	17.15	8.41	1.88
Anxiety	EG	Pre-test	20	18.40	7.12	1.59
		Post-test	20	12.00	6.53	1.46
	CG	Pre-test	20	16.30	7.62	1.70
		Post-test	20	17.15	7.38	1.65
Stress	EG	Pre-test	20	26.10	15.82	3.54
		Post-test	20	13.90	8.29	1.85
	CG	Pre-test	20	18.85	9.07	2.03
		Post-test	20	19.80	10.08	2.25

Note: EG = Experimental Group; CG = Control Group; SD = Standard Deviation; * = Statistically significant at the 0.05 level

Table 3. Paired sample t-test results comparing pre-test and post-test scores for the experimental and control groups

Variables	Group	Test	Mean	SD	Std. Error Mean	t	Df	p
Depression	EG	Pre-test	10.20	6.74	1.51	5.943	19	.000*
		Post-test						
	CG	Pre-test	-0.75	9.04	2.02	-0.374	19	.713
		Post-test						
Anxiety	EG	Pre-test	6.05	5.27	1.18	5.659	19	.000*
		Post-test						
	CG	Pre-test	-2.20	6.28	1.40	-2.491	19	.022*
		Post-test						
Stress	EG	Pre-test	8.45	11.92	2.67	3.609	19	.002*
		Post-test						
	CG	Pre-test	-1.55	10.12	2.26	-0.849	19	.406
		Post-test						

Note: EG = Experimental Group; CG = Control Group; SD = Standard Deviation; * = Statistically significant at the 0.05 level

Table 3 shows the results of the paired sample t-test that compares pre-test and post-test scores across three variables in both the experimental group (EG) and the control group (CG). The results suggested that the experimental group demonstrated statistically significant improvements in all variables (p < 0.01). The CG exhibited a notable change solely in SP (p < 0.01); no significant variations were seen in the other variables (p > 0.05).

Table 4 displays the outcomes of independent samples t-tests comparing the experimental group (EG) and control group (CG) across three variables during both the pre-test

Table 4. Results of independent samples t-test comparing the experimental and control groups at both pre-test and post-test stages

Variables	Tests	Experimental	Control	t	p
		Mean ± SD	Mean ± SD		
Depression	Pre-test	22.10 ± 9.91	15.60 ± 9.18	6.32	.000*
	Post-test	11.90 ± 8.15	14.85 ± 10.09	0.53	.599
Anxiety	Pre-test	18.70 ± 6.58	18.10 ± 7.59	0.32	.752
	Post-test	12.65 ± 5.90	20.30 ± 8.37	-2.02	.050*
Stress	Pre-test	24.55 ± 13.68	20.85 ± 9.98	1.11	.273
	Post-test	16.10 ± 7.53	22.40 ± 11.71	-2.53	.016*

Note: EG = Experimental Group; CG = Control Group; SD = Standard Deviation; * = Statistically significant at the 0.05 level

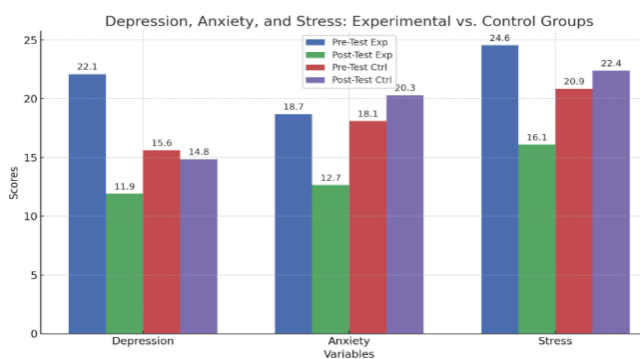


Fig. 1. Visual comparison of Depression, Anxiety, and Stress scores between the Experimental and Control Groups, for both Pre-Test and Post-Test

and post-test phases. The post-test findings demonstrate that the experimental group considerably outperformed the control group (CG) across all assessed variables. Figure 1 depicts the mean scores associated with these outcomes.

Discussion

This study found that a six-week yoga intervention significantly reduced levels of depression, anxiety, and stress among injured athletes in the experimental group. Results from paired sample t-tests showed meaningful decreases in depression ($p = .000$), anxiety ($p = .000$), and stress ($p = .002$) following the intervention. In contrast, the control group displayed no significant changes in depression ($p = .713$) or stress ($p = .406$), with only a slight reduction in anxiety ($p = .022$). Additionally, independent t-test results revealed that post-intervention anxiety ($p = .050$) and stress ($p = .016$) scores were significantly lower in the experimental group compared to the control group, highlighting the intervention's positive impact.

Analysis of pre- and post-test mean scores highlighted consistent improvements in psychological well-being among athletes who engaged in the yoga program. In contrast, those in the control group did not experience meaningful changes, suggesting that the observed benefits can be attributed to the yoga practices specifically, Yoga Nidra and Nadi Shodhana Pranayama. These findings support the integration of

holistic, mind-body techniques into injury rehabilitation programs. The differential responses between individuals may be influenced by personal coping mechanisms, sport-specific demands, levels of athletic experience, or injury severity (Vaughan et al., 2020).

Yoga, as a movement- and breath-based practice, extends beyond the general mental health benefits of physical activity by fostering emotional regulation and restoring nervous system balance. The specific techniques used in this study have previously been shown to reduce symptoms of psychological distress (Gomez-Espejo et al., 2022), and the present findings reinforce their therapeutic potential in athletic populations. Psychological symptoms like anxiety and depression are known to hinder recovery and delay return to sport, highlighting the importance of effective interventions.

The DASS (Depression Anxiety Stress Scales) proved to be a valuable tool for assessing psychosomatic symptoms in this context. Notably, pranayama has been found to affect key brain regions involved in emotional regulation such as the amygdala, anterior cingulate cortex, insula, and prefrontal cortex while also influencing the respiratory centers located in the brainstem (Mondal, 2024). These mechanisms suggest that breath regulation contributes directly to improved emotional resilience. Specifically, nasal breathing via the superior nasal meatus stimulates sensory receptors that balance autonomic function, reinforcing the connection between breath and psychological stability.

In tandem, Yoga Nidra supports psychological recovery by promoting deep relaxation, enhancing parasympathetic activity, and regulating cortisol levels. This technique also reduces hyper-arousal and increases dopamine release, which improves mood, motivation, and overall emotional well-being (Moszeik et al., 2022). Together, Yoga Nidra and pranayama offer a synergistic approach to stress management, providing a comprehensive and low-cost strategy to alleviate psychological distress in injured athletes. Ultimately, this study contributes to the growing body of literature on yoga-based interventions by empirically demonstrating their psychological benefits within a sports rehabilitation context. The statistically significant improvements across multiple domains affirm the value of integrating structured yoga practices into recovery protocols. Future research could expand upon these findings by examining the long-term effects of such interventions, exploring neurobiological mechanisms in more detail, and tailoring programs to specific sports or injury types to enhance their applicability and impact.

Conclusion

This study concludes that a structured yogic intervention, incorporating Yoga Nidra and Nadi Shodhana Pranayama, significantly reduced psychological distress—specifically depression, anxiety, and stress—among chronically injured interuniversity athletes. These improvements highlight the effectiveness of mind-body practices in supporting emotional well-being during the rehabilitation process. By promoting faster psychological recovery, the intervention may facilitate a quicker and more confident return to sport, which is essential for sustained athletic performance. The findings underscore the value of integrating yoga into injury

recovery protocols as a holistic, low-cost, and accessible approach to enhance both mental health and overall athletic resilience.

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Conflicts of Interest

The authors declare no conflicts of interest.

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Оцінювання впливу йогічної інтервенції на психологічний дистрес серед травмованих спортсменів

Сону Кумар^{1ABCDE}, Мінакші Сараф Кальяні^{1ABCDE}, Мукул Пант^{1ACDE},
Ануджа Рават^{1ABCDE}, Хірал Ядав^{1ABCDE}, Дессалегн Васа Мола^{2ACDE}

¹Університет Хемваті Нандан Бахугуна Гарвал

²Університет Амбо

Авторський вклад: А – дизайн дослідження; В – збір даних; С – статаналіз; D – підготовка рукопису; E – збір коштів

Реферат. Стаття: 6 с., 4 табл., 1 рис., 22 джерела.

Історія питання. Травмовані спортсмени часто стикаються із психологічним дистресом, що включає симптоми депресії, тривоги та стресу, які можуть перешкоджати їхньому відновленню. Забезпечення психічного благополуччя є важливою складовою комплексної реабілітації.

Мета дослідження. Мета цього дослідження полягала в оцінюванні ефективності структурованої йогічної інтервенції, що охоплює практики Йога-Нідра (йогічний сон) та Наді Шодхана Пранаяма (поперемінне дихання ніздрями), у зменшенні психологічного дистресу серед спортсменів із хронічними травмами.

Матеріали та методи. Сорок спортсменів із травмами тривалого характеру, віком від 19 до 26 років, які навчаються в Гархвальському університеті імені Хемваті Нандана Бахугуни в Уттаракханді, було розподілено за методом рандомізації на дві групи по 20 осіб, з рівною кількістю чоловіків та жінок у кожній групі: одна група учасників отримувала інтервенційний курс, натомість інша група учасників дослідження не була залучена до відповідного виду активності. З метою вимірювання психологічного дискомфорту було застосовано шкалу із 21 пункту для оцінки симптомів депресії, тривоги та стресу (DASS-21). Перед початком інтервенції обидві групи пройшли попереднє тестування. Експериментальна група отримувала курс йогічної інтервенції протягом шести тижнів (30 хвилин на день, п'ять днів на тиждень), тоді як контрольна група не проходила жодної інтервенції. Після завершення інтервенційного періоду для обох груп було проведено посттестування. З метою аналізу внутрішньогрупових та міжгрупових відмінностей використовувалися t-критерії для парних вибірок та незалежні t-критерії відповідно.

Результати. Експериментальна група продемонструвала значне поліпшення результатів за показниками депресії ($t = 6.65, p < 0.001$), тривожності ($t = 5.07, p < 0.001$) та стресу ($t = 5.72, p < 0.001$) на етапах від передтестового до післятестового періодів дослідження. У контрольній групі істотних змін не спостерігалось. Післятестовий порівняльний аналіз виявив суттєве покращення всіх показників в експериментальній групі порівняно з контрольною групою.

Висновки. Згідно з результатами представленого дослідження, структурована йогічна інтервенція забезпечила значне зниження психологічного дистресу у травмованих спортсменів, що свідчить про ефективність її застосування в якості комплементарної стратегії в процесі реабілітації. Йога-Нідра та Наді Шодхана Пранаяма можуть сприяти швидшому та ефективнішому відновленню організму через поліпшення психічного благополуччя.

Ключові слова: депресія, тривога, стрес, йога, травмовані спортсмени, реабілітація та психологічний дистрес.

Information about the authors:

Kumar, Sonu: sonupal200m@gmail.com; <https://orcid.org/0009-0009-0707-652X>; Department of Physical Education, Hemvati Nandan Bahuguna Garhwal University, Srinagar, 246191, Garhwal, Uttarakhand, India.

Kalyani, Meenakshi Saraf: meenakshisaraf2108@gmail.com; <https://orcid.org/0009-0004-0024-554X>; Department of Naturopathy and Yoga, Hemvati Nandan Bahuguna Garhwal University, Srinagar, 246191, Garhwal, Uttarakhand, India.

Pant, Mukul: mukkul08@gmail.com; <https://orcid.org/0000-0002-9700-2162>; Department of Physical Education, Hemvati Nandan Bahuguna Garhwal University, Srinagar, 246191, Garhwal, Uttarakhand, India.

Rawat, Anuja: dr.anujarawatyoga@gmail.com; <https://orcid.org/0009-0007-2112-5039>; Department of Naturopathy and Yoga, Hemvati Nandan Bahuguna Garhwal University, Srinagar, 246191, Garhwal, Uttarakhand, India.

Yadav, Hiralal: hiralal08@gmail.com; <https://orcid.org/0000-0003-3295-8523>; Department of Physical Education, Hemvati Nandan Bahuguna Garhwal University, Srinagar, 246191, Garhwal, Uttarakhand, India.

Mola, Dessalegn Wase: dessalegn.wasie@gmail.com; <https://orcid.org/0000-0001-9688-0775>; Department of Sport Science, College of Natural and Computational Sciences, Ambo University, Ethiopia.

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