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## THE EFFECT OF PRANAYAMA ON POST-TRAUMATIC STRESS AMONG INJURED ATHLETES

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### ABSTRACT:

**Introduction :-** Post-traumatic Stress Disorder (PTSD) is an anxiety disorder that can occur following the experience or witnessing of a traumatic event. The developmental nature of the disorder makes it important to intervene with the symptoms at the initial stages.

**Statement of Problem :-** The present study focuses on the effect of pranayama intervention on PTSD symptoms among injured sportsmen.

**Methodology :-** The present study is a clinical trial for treating post-traumatic stress using pranayama administration to injured athletes. 06 weeks of pranayama intervention was given to 54 injured athletes and the pre as well post intervention results were compared on the basis of SPRINT & PTSD CHECKLIST FOR DSM-5 (PCL-5).

**Data Analysis :-** Both the measures used in the present study are very simple to analyse self-report measures. SPRINT measure has a cut off score of 14. PTSD Checklist for DSM-5 (PCL-5) has a cut off score of 33. Mean was used as the statistical technique to simply observe the behavioural differences between the two groups. Additionally, as the current study involves clinical trials, individual reports and data analysis were also crucial.

**Results :-** Unforgiving episodes can take off a deep-rooted mental affect. Sports damage restoration centres basically on physical improvement. Mental quality is additionally required to be re-established back to its best usefulness to guarantee total recovery. From the comes about of current consider, it is concluded that pranayama intercession for the treatment of post-traumatic side effects within the case of harmed competitors as portion of their mental restoration program indeed some time recently the physical restoration starts has its claim importance and significance for the recuperation of recollections of the appalling occasion which can be annoying for competitors and advance can lead to advancement of related post-traumatic stretch clutter (PTSD).

**KEYWORDS:** Athletes, Intervention, Mental Recovery, Post-traumatic Stress, Pranayama, Rehabilitation, Sports Injury, Treatment, Yogic Practices.



## INTRODUCTION:

The majority of sports disciplines whether it be acrobatic sports, martial arts, or another sport, carries a risk of injury as all sports involve movements of a person's body parts moving in space while their large and small muscles exert force to carry out these vigorous movements, injuries are a possibility in the majority of sports disciplines.

Many athletes or players go through various forms of physical therapy and rehabilitation activities during this injury period of their sporting careers to return to their pre-injury level of physical and functional health. But very rarely do managers, coaches, or even the injured player emphasise the need of returning to their psychological well-being and mentally sound state of mind prior to the injury.

For every athlete, suffering from a sports injury is painful and tragic. Any athlete who sustains a sports injury will find it traumatic and devastating. No athlete is happy being injured. Athletes' post-injury psychological health is a crucial component of their overall injury recovery. Due to the distressing experience, there is a chance that injured players would have post-traumatic stress, which could be extremely harmful if the tension builds up and causes the athlete to develop post-traumatic stress disorder (PTSD).

Posttraumatic Stress Disorder (PTSD) is an anxiety disorder that can occur following the experience or witnessing of a traumatic event. A traumatic event is a threatening event such as military combat, natural disasters, terrorist incidents, serious accidents, sports injuries or physical or sexual assault in adult or childhood. However, some people will have stress reactions that do not go away on their own, or may even get worse over time. These individuals may develop PTSD. (2010)

It is important for anyone with PTSD symptoms to work with a mental health professional who has experience treating PTSD. The main treatments are psychotherapy, medications, or both. An experienced mental health professional can help people find the treatment plan that meets their symptoms and needs. (2020)

However, many researchers believe yoga intervention techniques and yogic practices can help the injured person from developing post-traumatic stress. (Jindani et al., 2015) through clinical trial demonstrated significant changes in PTSD scores upon Kundalini Yoga Administration. (Mitchell et al., 2014) in their study conducted a randomized controlled trial comparing a 12-session Kripalu-based yoga intervention concluded, yoga may be an effective adjunctive treatment for PTSD. (Martin et al., 2015) also conducted a randomized control trial of Yoga on women suffering from PTSD and the results showed no significant changes. The numerous studies that have been conducted on yogic therapies for the treatment of posttraumatic stress disorder all point to the need for more knowledge and research before it can be determined whether yoga is effective at all in treating PTSD. Sports Injury Rehabilitation process should emphasize on this particular psychological aspect of well-being in addition to physical therapy.

The current study focuses on using pranayama as a yogic intervention which is based on flow and conscious awareness of breath and requires the least amount of physical effort because all that is required is to perform consciously controlled breathing patterns that are divided into Puraka (inhalation), Abhyantra Kumbhaka (the mindful pause after inhalation), Rechaka (exhalation), and Bahya Kumbhaka. (The mindful pause after exhalation) to alleviate post traumatic stress experiences of injured sportsperson. Athletes who are injured can practise pranayama because it requires little physical effort and can be done without moving any body parts, so there is little possibility of aggravating their injuries during recovery.

## METHODOLOGY

**Design** – The present study is a clinical trial for treating post traumatic stress using pranayama administration to injured athletes. Candidates who met initially criteria for being ready for the trial (athletes who were experiencing post-traumatic stress). Those who needed the pranayama intervention based on the results of *SHORT PTSD RATING INTERVIEW (SPRINT)* were kept into the experimental group upon whom pranayama intervention and test administration will be done. Those who didn't meet the minimum conditions set by the researcher and actually didn't need the intervention

based on SPRINT results were automatically designated as the control group participants. Static Comparison Pre-Experimental Group Design Method.

**Measures – 1. SHORT PTSD RATING INTERVIEW (SPRINT) :-** The Short Post-Traumatic Stress Disorder Rating Interview (SPRINT) is an 8-item self-report measure and can be administered directly to the subjects. PTSD is a simple tool to measure the severity of symptoms related to PTSD experienced by victims of some traumatic mishap. It is a 5-point Likert Scale ranging from 0-4. Items are summed to provide a total severity score.

0 = Not at all            1 = A little bit            2 = Moderately 3 = Quite a lot            4 = Very much

For the purposes of diagnostic screening, if one assumes a 20% prevalence of PTSD in the population, then a cut off score of 14 or greater was found to carry a 95% sensitivity to detect PTSD, and 96% specificity for ruling out the diagnosis, with an overall accuracy of correct assignment being 96%(Connor & Davidson, 2001).

**2. PTSD CHECKLIST FOR DSM-5 (PCL-5) -** The PTSD Checklist for DSM-5 is a 20-item self-report measure that assesses the presence and severity of PTSD symptoms. Respondents are asked to rate how bothered they have been by each of 20 items in the past month on a 5- point Likert scale ranging from 0-4. Items are summed to provide a total severity score (range = 0-80).

0 = Not at all            1 = A little bit            2 = Moderately 3 = Quite a bit            4 = Extremely

The PCL-5 can determine a provisional diagnosis by Summing all 20 items (range 0-80) and using a cut-point score of 31-33. A total score of 31-33 or higher suggests the patient may benefit from PTSD treatment. Scores lower than 31-33 may indicate the patient either has subthreshold symptoms of PTSD or does not meet criteria for PTSD, and this information should be incorporated into treatment planning (Weathers et al., 2013).

**Participants –** Attending a yoga session regularly for more than 01 week during the previous three months, substance abuse issues within the last three months, were grounds for exclusion. Participants include 86 injured sportsperson in total from which  $n_e = 54$  participants were included in Experimental Group and  $n_c = 32$  participants were designated the control group based on the results of SPRINT. Purposive sampling method was used as a necessity to fulfil the study objectives.

**Procedure –** In January 2023, the study got underway with the selection of subjects from a national institute for physical education and sports sciences. A research assistant from the same institute helped make the subject availability and test method administration possible by helping to locate this many subjects of this particular group (injured athletes) in one location. When the study's goals and significance were made obvious to each subject, 86 wounded athletes consented for the study. Following subject recruiting process, the SPRINT Measure was provided, and the subjects were required to complete it. SPRINT was used to ascertain whether the subjects were in fact experiencing post-traumatic stress.

Cut-off score of 14 was recommended by (Connor & Davidson, 2001), the same was used in the study to get the experimental group and to everyone's surprise a total of 54 participants out of 86, i.e.,  $n_e = 54$ , have scored more than 14 in the SPRINT measure which means they are somehow associated with post-traumatic stress. Surprising fact was many of them weren't aware of this concept as they thought it was normal having such thoughts after an accident but according to a report by National Institute of Mental Health, People who have PTSD may feel stressed or frightened, even when they are no longer in danger (2020). The informative document from the U.S. Department of Health and Human Services stating risk factors leading to PTSD like Exposure to dangerous events or traumas, Getting hurt or seeing people hurt, having little or no social support after the event, Dealing with extra stress after the event, such as pain and injury, or loss of a job (2020) were experienced by many subjects. The remaining subjects volunteered as control group,  $n_c = 32$ .

The experimental group's pranayama sessions were led by a certified yoga instructor beginning in the first week of February 2023 in the morning session because early morning is the best time of day to practise yoga, according to the yoga tradition. Time is a significant consideration, but it is not the only aspect that determines the efficacy of your practise. Other requirements include an empty stomach, a serene setting, mental calmness, and so forth. Pranayama should be practised in the morning, according to yoga experts. There are no outside distractions, you have a clear mind, and your meal has been fully digested. The positive effects of your practise are amplified by the favourable atmospheric energy, which is active with Vata (air and ether) (sutra). The research assistant was in charge of the control group, making sure they were not engaging in any out-of-schedule activities that might skew or impair the study's findings.

Over the course of 06 weeks, the experimental group participated in pranayama sessions five days a week. Anulom-Vilom & Kapalbhathi were used as a warm-up to direct and gradually boost blood flow during the approximately 25-30 minute pranayama session. Following a warm-up, the subjects performed Suryabhedhi, Chandrabhedhi, Shitala, and Shitkari forms of pranayama from Monday through Friday at varied frequencies, week in and week out. Abhyantra and Bahya Kumbhak methods were also introduced after four weeks, with improvements showing. (Detailed curriculum available upon request). All sessions were led by certified yoga instructors and students at the Master's level, together with a research assistant.

Additionally, feedback and follow-up meetings were held. All 54 members of the experimental group were requested to complete the 08-item SPRINT measure once again after finishing a successful and reviving 06 weeks of pranayama instruction. Additionally, all subjects, including those in the control group, were given a copy of the PTSD Checklist for DSM-5 (PCL-5) separately and were asked to complete it.

**STATISTICAL ANALYSIS**

- Both the measures used in the present study are very simple to analyse self-report measures.
- SPRINT measure has a cut off score of 14.
- PTSD Checklist for DSM-5 (PCL-5) has a cut off score of 33.
- Mean was used as the statistical technique to simply observe the behavioural differences between the two groups.
- Additionally, as the current study involves clinical trials, individual reports and data analysis were also crucial.

**RESULTS**

**Table 1 - Pre-test and Post-test Results of Short PTSD Rating Interview (SPRINT)**

TOTAL, N = 86		EXPERIMENTAL GROUP	CONTROL GROUP
Pre-test Results	Cut Off Score - 14	n <sub>e</sub> = 54 (above 14)	n <sub>c</sub> = 32 (below 14)
	Combined Means	n <sub>e</sub> = 21.70	n <sub>c</sub> = 11.60
Post-test Results	Combined Means	n <sub>ep</sub> = 14.90	n <sub>cp</sub> = 12.20
	Individual Results	Total = 54 Above 14 = 07 (still symptomatic) Below 14 = 47 (recovered)	Total = 32 Above 14 = 0 Below 14 = 32

**Table 2 - Results of PTSD Checklist for DSM-5 (PCL-5)**

<b>n<sub>e</sub> = 54 ; n<sub>c</sub> = 32</b>	<b>EXPERIMENTAL GROUP</b>	<b>CONTROL GROUP</b>
Combined Mean	27.60	32.50
Individual Results	Total = 54 Above 33 = 5 (still symptomatic)	Total = 32 Above 33 = 4
Cut Off Score – 33	Below 33 = 49 (recovered)	Below 33 = 29

According to the results of the SPRINT and PTSD Checklist for DSM-5 (PCL-5) measures, the majority of the injured athletes in the experimental group had recovered from their posttraumatic symptoms after receiving the pranayama intervention, which had been carefully administered throughout the entire procedure. Detailed additional findings and results are discussed in the following sections.

## DISCUSSION

Post-Traumatic Stress may occur due to experiencing a profoundly traumatic event leading to a constellation of symptoms that include intrusive and distressing memories of the event, avoidance of stimuli connected to that event, negative emotional states, feeling of detachment from others, proneness towards outburst etc. might occur (Psychology). PTSD involves a group of symptoms emerging as an intense emotional response to an event that involved actual or possible death or injury. In certain athletes, a severe or career-ending injury may generate PTSD-like symptoms. Individuals with PTSD may relive traumatic events in their thoughts during the day and in nightmares when they sleep which can be a very disturbing experience for anyone to relive those traumatic moments time and time again.

Many studies have been done in behavioural sciences regarding effects of yoga and pranayama practices on various psychological modules and variables. (Karuppasamy, 2019) in his study reveals that the pranayama with meditation group showed better performance on mental health and self-concept than the control group owing to the effects of pranayama with meditation. (Jagadeeshwaran, 2022) in his investigation studied the effect of asanas and pranayama practices on selected psychological variables ( stress and aggression) among college men students and the eight weeks of asana and pranayama practices on psychological variables improved the among the players.

The goal of the current study is to determine the effectiveness of pranayama as a yoga intervention for treating PTSD symptoms in patients who have experienced sports-related injuries which is very crucial case to study as most sports injury rehabilitation schedules and programmes have been made on the principles of physical therapy and conditioning solely neglecting the psychological perspective of the rehabilitation process.

SPRINT's and the PTSD Checklist for DSM-5 (PCL-5)'s divergent use cases have been beneficial to the study's objectives, methodology, and conclusions.

Prior to the start of the pranayama intervention, a total of 86 subjects were initially required to complete the SPRINT Measure, which is primarily used to gauge the severity of PTSD symptoms in those who have endured a significant trauma. The scale can give a sense of how severe an issue or certain symptoms may be, even if they do not satisfy the diagnostic criteria for PTSD. In order to identify the experimental group in the current study, subjects who were experiencing posttraumatic stress before the intervention started, the researcher employed the SPRINT measure as a diagnostic tool.

After the experimental group's (n<sub>e</sub> = 54) pranayama intervention plan was completed, or after six weeks, the presence and severity of PTSD symptoms were evaluated using the PTSD Checklist for DSM-5 (PCL-5). To assess the severity of PTSD symptoms between the experimental group and the control group and to determine the effects of the pranayama intervention on posttraumatic stress, the PTSD Checklist for DSM-5 (PCL-5) is a comprehensive PTSD report measure.

Understanding the results obtained post statistical analysis from Table 1 and Table 2.



- Pre-test using SPRINT measure provided us with subjects who were in need of intervention as they are experiencing post-traumatic stress symptoms due to the injury they had. SPRINT measure was again given to both the experimental and control groups as a post-test diagnostic tool and comparison indicator following the completion of a six-month pranayama intervention. Only seven of the experimental group's 54 individuals still achieved a SPRINT Measure score of greater than 14 when compared individually. Rest 47 have healed from their posttraumatic stress disorder symptoms, giving us a favourable behavioural shift that can be credited as a good result of the pranayama intervention. Defining the success rate of the intervention over posttraumatic stress among the present subjects,

$$\begin{aligned} \text{Success Rate} &= (\text{No. of Participants Recovered} / \text{Total no. of Participants}) * 100 \\ &= (47 / 54) * 100 = 87\% \text{ approximately.} \end{aligned}$$

- Another change can be seen in the pre-test post-test combined mean values of the experimental group and control group, which show that the control group's combined mean had increased to its pre-test mean. This indicates that although the control group's participants had recovered physically over the course of six months, their posttraumatic stress levels had slightly increased, meaning they were now experiencing more PTSD symptoms. In contrast, the post-test means for the experimental group have decreased by significant amounts once more, thus inferring a favourable effect of the pranayama intervention programme on the experimental group.
- To confirm the above findings, same group of subjects were also administered with PTSD Checklist for DSM-5 (PCL-5).
- Only 05 were still symptomatic interpreted by the cut off score for PTSD Checklist for DSM-5 (PCL-5) i.e., 33. Therefore, total 49 from experimental group have recovered the symptoms of post-traumatic stress confirming the valid findings and success of the yogic intervention.
- A crucial finding to be discussed is from the control group, 04 participants who previously had lesser intensity of symptoms according to SPRINT Measure have slowly developed more symptoms in due course because of no interventive rehabilitation. Therefore, the importance of mental rehabilitation post injury can be understood as significant as these symptoms may develop overtime, if not treated/intervened.

## CONCLUSION

Harsh incidents can leave a lifelong mental impact. Sports injury rehabilitation focuses mainly on physical betterment. Mental strength is also needed to be restored back to its best functionality to ensure complete rehabilitation. From the results of current study, it is concluded that pranayama intervention for the treatment of post-traumatic symptoms in the case of injured athletes as part of their mental rehabilitation program even before the physical rehabilitation begins has its own significance and importance for the recovery of memories of the tragic event which can be upsetting for athletes and further can lead to development of related post-traumatic stress disorder (PTSD).

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