EFFECT OF MENTAL IMAGERY AND TRANSCENDENTAL MEDITATION ON SALIVARY CORTISOL IN VOLLEYBALL PLAYERS

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Abstract: This study looked at how salivary cortisol levels in volleyball players responded to a relaxation programme, behaviour modelling video, and imagery. Elite volleyball players, both male and female, were a part of the quasi-experimental design. At a significance threshold of P0.05, the data were examined using (experimental and control), (male and female), multifactor analysis of covariance with repeated measurements. The results showed a substantial main effect between the experimental and control groups, proving that the mental training programme significantly affected the level of salivary cortisol.

Keywords: volleyball, programme, imagery

1. Introduction

Researchers, athletes, and coaches are becoming more and more aware of the reality that psychological elements can enhance or detract from a successful sports performance. The phenomenon that has been the subject of the most research in sport psychology is stress. The intense pressure that athletes experience during competition jeopardises their psycho-physiological wellbeing. This fact alone has prompted researchers to look for an appropriate and dependable strategy to curb the harmful effects of stress-related behaviour. To completely comprehend the difficulties faced by athletes and coaches, however, a significant amount of effort and research still needs to be done. Despite the fact that there are numerous definitions of stress from well-known sports psychologists, Martens claims that stress in athletics arises from two different conditions.First, the importance of the athletes' desire to

perform well is linked to stress. Second, there is always tension associated with result uncertainty. This is particularly true when winning is the motivation behind the competition. Athletes, after all, do not enjoy losing. External pressures exist as well, mainly from the competitors and teammates of the athletes. Whether there is a sense of threat or a requirement to perform in a certain way, the impacts of stress are always challenging to manage. The majority of athletes have specific coping mechanisms to help them deal with stress. However, Lazarus and Folkman pointed out that the impact of stress depends on the interaction between the individual and the environment, assuming that people engage in such active interaction.Researchers have put out a variety of models to describe how a person's environment is connected.

Indirect instrumentations have been used by the majority of models to access data gathering, which frequently results in a limited generalisation of the findings. The use of physiological and biochemical markers, such as blood and salivary cortisol, has provided a novel way to view how stress affects the body. The most significant glucocorticoid, cortisol, is produced by the adrenal cortex and can be measured in plasma, urine, and saliva. The salivary cortisol measurement has an advantage over plasma testing in that it is both simpler and less invasive.Salivary cortisol has long been utilised as a biomarker for mental stress and illnesses with a mental or physical component. Also, it is a trustworthy predictor of how the hypothalamus-pituitary-adrenal (HPA) axis is working. The HPA axis is engaged when a competitive demand is felt, increasing cortisol levels. Cortisol returns to its basal level once the stressor's effects have faded. This study's goal was to measure cortisol levels in a genuine competitive environment to see if a mental training programme intervention incorporating visualisation, relaxation, and video modelling would have a positive impact on stress reduction.

Ribeiro et al. (2022) The research was conducted to investigate national coaches' perspectives on the value of MI in real-world contexts by examining how they comprehend, use, and promote its usage. Marshak et al. (2022) volleyball players who participated in a 4-week mindfulness and self-talk intervention (MSTI) showed improvements in serving accuracy, mindfulness, and self-talk. Ilham et al. (2022) During the Covid-19 epidemic, it was investigated how mental abilities and anxiety levels relate to one another. Yassin et al. (2021) The study's overarching goal is to aid coaches and inspire young volleyball players to read by spreading knowledge about the significance of mental and psychological aspects of learning and training in fundamental skills, such as the serve, which is the starting point for every attack and can sometimes result in a point without the help of other players. Laoufi and

Alouane (2021) This research aimed to determine how mental perception affected the development of specific fundamental volleyball abilities in high school students physical and sports education classes. Benítez-Sillero et al. (2021) In order to identify the existence of specific psychological abilities throughout the formative stages of young football players, research was conducted to examine the link between the many variables that make up mental toughness and age categories.

Bhunia, B. (2020) Stress in an internal force. It is organic and psychological tending to produce wear and tear on the body. Stress on a system is varied by changing the load, temperature, vibration, etc. Schötz et al. (2016) Only a few studies have investigated the sense of time in experienced meditators. In the current case–control study, we investigated whether 20 practitioners in transcendental meditation (TM) showed differences in the perception of time as compared to 20 matched controls. Muda et al. (2019) the purpose of this study was to verify the development of body awareness when practising yoga or a professional sport, to determine whether athletes should undertake mental practices outside of their sport, and how they compare to body-conscious individuals.

2. Objectives:

➢ To Descriptive Statistics of Sports AX in MI group for VB Players
➢ To Comparison of the MI group's PPT mean and SD scores for sports AX

3. Selection of Sample

Seventy-Five Elite volleyball players are those who have represented minimum state level competition of open category and belonging to Kanpur Nagar and Kanpur Dehat districts of Uttar Pradesh or those who have represented C.S.J.M. university will act as the subject. Twenty-five from each group. The age of the subjects ranging from 18-23 years. Subjects will be divided in to two experimental group and one control group.

4. Collection of Data

The data will be collected through pre-test and post-test. Required instructions will be given before the administration of the test.

5. Imagery, Relaxation, and Video Modelling

The intervention was a 5-minute behaviour-mapping film that was specially created to fit the study's goals. After demonstrating how successful people behave in terms of their choices, tactics, attitudes, and body language, the intervention was followed by five minutes of

progressive relaxation and five minutes of imaginative play, during which athletes were urged to turn negative and stressful circumstances into positive thoughts and success in their competition performance (imagery MG-A). The intervention took place over 15 sessions spread out over three different days each week. The same methodology was used to obtain fresh saliva samples after the conclusion of the intervention.

6. Statistical Analysis:

In order to assess the effect of mental imagery and transcendental meditation on selected psychological variables and skill ability of volleyball players, Descriptive Statistic and Analysis of Co-variance (ANCOVA) will be used. The level of significance will set at 0.05 level.

7. Results:

Table 1: Descriptive Statistics of Sports AX in MI group for VB Players

MI group (n=25)	PRT	POT
Mean	43.92	32.32
SE of Mean	0.723	0.354
Median	44.00	32.00
SD	3.61	1.77
Variance	13.07	3.14
Sk	1.18	1.03
SE of Sk	0.464	0.464
KT	1.97	0.296
SE of KT	0.902	0.902
MIM	39.00	30.00
MM	54.00	36.00

Regarding the MI group in sports AX, Table 1 provides numerous facts about VB players. The average and SD of the players' MI group PRT and POT were 43.92, 3.61 and 32.32, 1.77 respectively, PRT (39; 54) and POT (30; 36) were the most minor and highest values for the MI group in the same categories.

Positive Sk was seen in the pre-and POT variables. The majority of the data is on the bottom (left) side, according to a positively skewed distribution. KT values were all positive, indicating that the data on this variable had a normal distribution.

As the value of KT is positive, it is leptokurtic but both the values of skewers and KT are well within the accepted limits of chance fluctuation. When the coefficient of variance was

examined, it was discovered that the CG's PRT variability was 13.07 while the POTs highest variability was 3.14.

Table 2: Significance of DB PPT Performance of MI Group in Sports AX

Groups	Mean	SD	SE Mean	DM	SE Mean Diff.	"t" ratio
PRT	43.92	3.62	.723	11.60	0.785	14.77*
POT	32.32	1.77	.354			

*Significant at 0.05 level

$t_{.05}$ (24) = 2.064

Table 2 shows a significant difference in the means of the pre-and POTs in the group of people who experienced trait AX related to their mental imagining. The value obtained of paired 't' (14.77) was greater than the tabulated value of 't' (2.064), which needed to be significant at (24) degrees of freedom with a 0.05 level of significance.

Therefore, the mean difference was calculated as 11.60, and the standard error of difference was 0.785. This is because the value obtained of paired 't' (14.77) was more significant than the table value of 't' (2.064).The EG will receive eight weeks of proper supervision and guidance from the researcher as they engage in 45 minutes of daily practice of Mental Imagery training. On the other hand, the CG will not receive any practice whatsoever during the study. The mental imagery training program, which covers eight weeks and is applicable to EG one.

Above result of data shows that twelve weeks training of mental imagery of experimental group of 25 students has significant effect of on the improving passing, serving ability among the MI VB players. The results may be due to training has been given through mental imagery and other mental activities to boost mood and increase drive to succeed and reduce sports AX, reduce stress ,encourage pride in your accomplishments as team member.

Training enhances their personal worth, personal success and confidence. Mental imagery training was helpful to develop positive attitude among adolescents which is expressed in self-confidence, self-assurance. Best athletes use imagery generally to build their powers and eradicate their faults to complete the task more efficiently. These are the reason for significant improvement in confidence and focus and reduce sport AX of students of IM Experimental Group.Figure 1 depicts the graphical representation of the mean and SD of the pre and POT performance of the MI group in the sports AX scale.
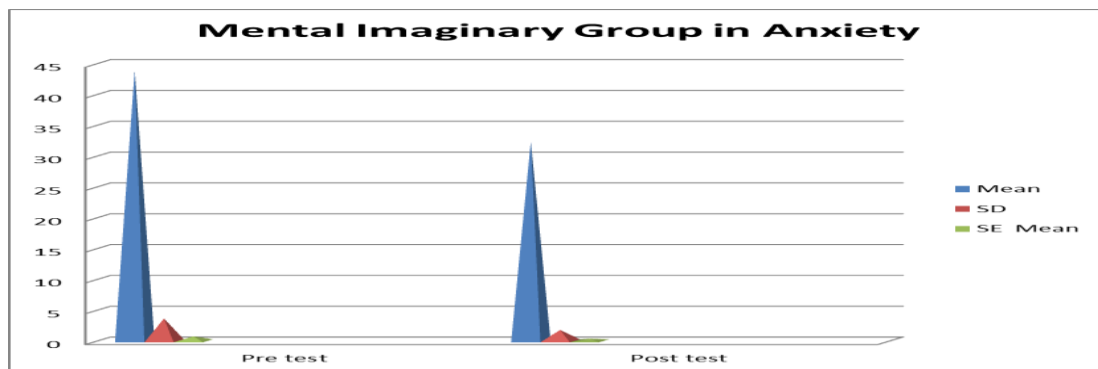
Fig. 1:Comparison of the MI group's PPT mean and SD scores for sports AX

Table 3: Descriptive Analysis in Sports AX Test in TMG for VB Players

TM (n = 25)	PRT	POT
Mean	44.88	31.68
SE of Mean	0.853	0.275
Median	44.00	32.00
SD	4.26	1.37
Variance	18.19	1.89
Sk	1.26	.529
SE of Sk	0.464	.464
KT	0.739	0.208
SE of KT	0.902	0.902
MIM	39.00	30.00
MM	54.00	35.00

Regarding the TMG in trait AX, Table 3 provides numerous facts about VB players. The average and SD of the players' TM was PRT: 44.88, 4.26 and POT: 31.68, 1.37. PRT (39; 54) and POT were (30; 35) the most minor and highest values for the TMG in the same categories.Positive Skewers was seen in the PPT variables. The majority of the data is on the bottom side, according to a positively skewed distribution. Since the KT value was negative for all PRT variables except POT, it is clear that these variables' data was less consistent than that of a normal distribution.Examining the coefficient of variance value revealed that the PRT on TM had the highest variability 18.19 and the POT had the lowest variability 1.89, concerning the test results.

Table 4: Significance of DB PPT Performance of TMG in Sports AX

Groups	Mean	SD	SE Mean	DM	SE Mean Diff.	't' ratio

PRT	44.88	4.26	0.853	13.20		
POT	31.68	1.37	0.275		0.862	15. 31*

*Significant at 0.05 level

$t_{.05}(24) = 2.064$

Table 4 shows a significant difference in the means of the pre-and POTs in the TMG related to their trait AX. The value obtained of paired 't' (15.31) was greater than the tabulated value of 't' (2.064), which needed to be significant at (24) degrees of freedom with a 0.05 level of significance. Therefore, the mean difference was calculated as 13.20, and the standard error of difference was 862. This is because the value obtained of paired 't' (15.31) was more significant than the table value of 't' (2.064).

As per above data, result reveals that TM techniques are highly effective to overcome the sports AX and stress related conditions. Reasons for the above results might be that TM techniques have inculcated different types of qualities among experimental group of TM like management of stress, AX and depression.

That is why reduction in sports AX happens due to TM in the POT of experimental group effect of TM training is positive on stress and sports AX.so there is significant difference in the means of the pre-and POTs in the TMG related to their trait AX. Figure 4.2 depicts the graphical representation of the mean and SD of the pre and POT performance of the TMG in the Sports AX scale.

Specifically, the use of different definitions, conceptualizations, and assessment inventories may yield different emotional intelligence profiles of the same individual or team. Stay motivated and setting a strong goals and targets is necessary for all the athletes and are contributing for prediction of performance for athletes. An exercise program stressing the components of muscular endurance and muscular strength increases self-concept.
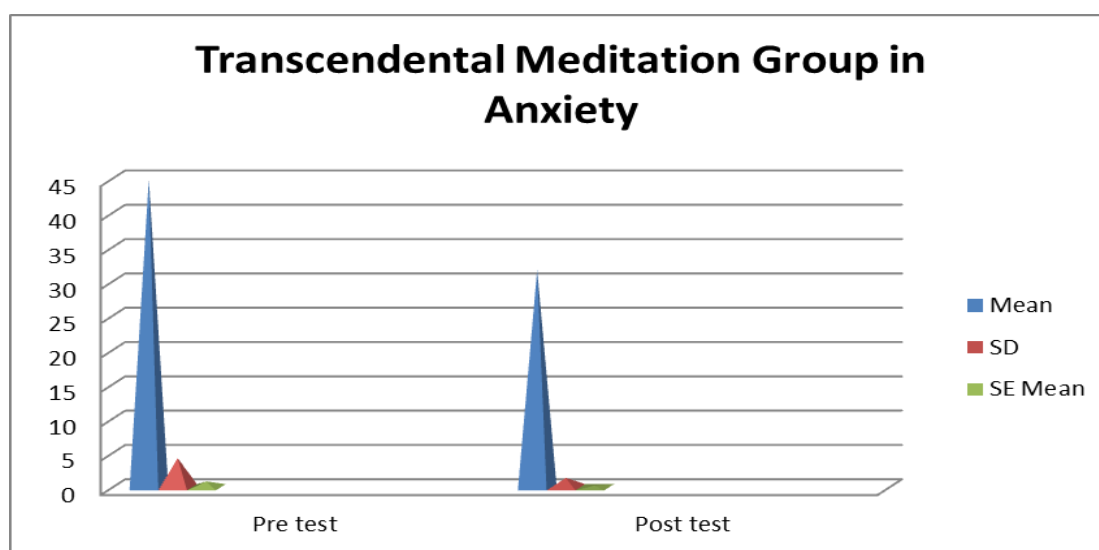
The fact that the pre-and POT value of KT was negative indicates that these variables' data were less predictable than those with a normal distribution. The most significant variability was found to be 1.21 in connection to the POT, while the minimal variability was found to be 4.57 in the PRT for the CG.

Table 5: Descriptive Analysis in Sports AX Test in CG for VB Players

CG (n = 25)	PRT	POT
Mean	32.64	31.72
SE of Mean	0.427	0.220
Median	32.00	32.00
SD	2.13	1.10
Variance	4.57	1.21
Sk	.485	-0.002
SE of Sk	0.464	0.464
KT	-0.841	-0.596
SE of KT	0.902	0.902
MIM	30.00	30.00
MM	37.00	34.00

Table 6: Significance of DB PPT Performance of CG in Sports AX

Groups	Mean	SD	SE Mean	DM	SE Mean Diff.	"t" ratio
PRT	32.64	2.13	0.427	0.92	0.516	1.782
POT	31.72	1.100	0.220			

*Significant at 0.05 level, $t_{.05}(24) = 2.064$

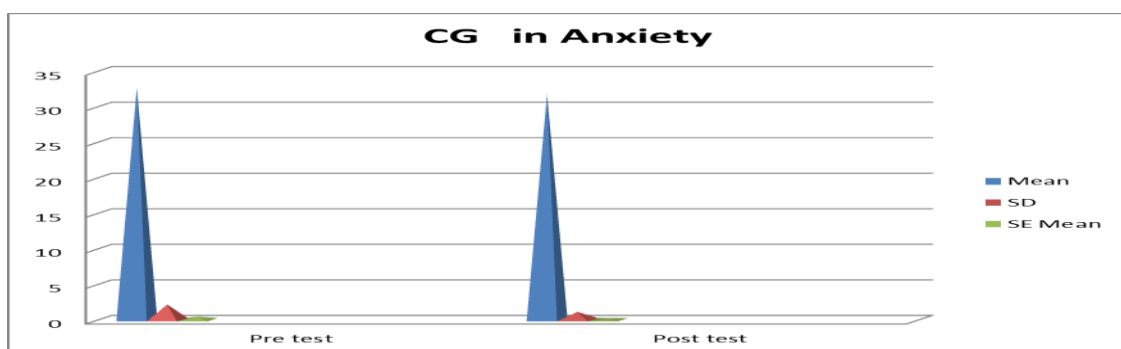Table 6 shows an insignificant difference in the means of the pre-and POTs in the CG related to their trait AX.

Fig. 3: Comparison of the CG's PPT mean and SD scores for sports AX

The value obtained of paired 't' (1.782) was lesser than the tabulated value of 't' (2.064), which needed to be significant at (24) degrees of freedom with a 0.05 level of significance. Therefore, the mean difference was calculated as 0.92, and the standard error of difference was 0.516. Figure 3 depicts the graphical representation of the mean and SD of the pre and POT performance of the CG in the Sports AX scale.Above table shows there is no significant DB the mean score of PRT and POT on trait sports AX of CG 'athletes.

8. Conclusion

The results showed a substantial main effect between the experimental and control groups, proving that the mental training programmer significantly affected the level of salivary cortisol. As salivary cortisol levels and stress have a positive correlation, the changes imply that the athletes' stress levels have decreased. Subjects should be screened based on imagery ability scores, nevertheless, as individual capacity to utilize imagery to aid stress management in sports is likely to be low among athletes with poor imagery abilities. Research shows that players with high MT ratings typically compete at higher levels, accomplish more, and put out greater performances. One of the most significant psychological traits linked to athletic achievement is MT.

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