

**Volume: 13; Issue-3; 2022**

**ISSN 0976-3678**



**BHARATHIAR NATIONAL JOURNAL OF PHYSICAL  
EDUCATION AND EXERCISE SCIENCES**

**BNJPEES**

**DOUBLE - BLIND REFERRED JOURNAL**



**DEPARTMENT OF PHYSICAL EDUCATION  
BHARATHIAR UNIVERSITY  
COIMBATORE-641046**

### **From the Editors' Desk**

Whilst we are striving hard to manage the new normal post Covid pandemic, there is a great realization on health fitness and wellness. The department of Physical Education, Bharathiar University with societal responsibility publishes this 13th volume of 'The Bharathiar National Journal of Physical Education and Sports Sciences'. In spite of the pandemic break the editorial team had put in tremendous efforts to bring out this volume of research works and articles.

The **Bharathiar National Journal of Physical Education and Exercise Sciences (BNJPEES)** is an open access quarterly journal, double blind refereed journal with ISSN- 0976-3678 which publishes original articles, commentary, editorials, review articles and case reports covering recent innovative high quality researches on sports published by the Department of Physical Education, Bharathiar University Coimbatore since June 2010. The purpose of this journal is to enrich the field of physical education and sport with literary base dynamic latest research and articles. The field of sport and physical education with its dynamic nature needs a literary back up to keep the masses informed of the latest changes that are happening across this field. Since the Sports Climate is experiencing a wide range of change and is very much essential that we stretch ourselves to meet the key challenges on sports and games. Since the inception of the new editorial team from 2019, the journal has been upgraded online to increase the vicinity across the globe and provide a wider citation opportunity scaling up research heights. The journal has been indexed with google scholar, world cat, core and road.

We appreciate the research scholars for stepping forward to get their works published in our university journal. The submitted articles are subjected to a double blind referee system for review. Based on the reviewers report the articles are accepted. We are also working hard towards quality control of the articles in par with the international standards.

From the editorial desk we submit to you that BNJPEES, with immense pleasure is working for the development of research in the field of Physical education and sports sciences which is the need of the hour. We encourage the authors to submit evidence based real time research results which would benefit the society.



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**BNJPEES -A Double Blind Refereed University Journal**

**Vol: XIII; Issues1-4; 2022**

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<b>ISSN</b>	<b>0976-3678</b>
<b>Published by</b>	Department of Physical Education Bharathiar University, Coimbatore-641046, Tamilnadu, India

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**BHARATHIAR NATIONAL JOURNAL OF PHYSICAL EDUCATION AND  
EXERCISE SCIENCES  
2022 VOLUME 13 ISSUE 3**

S.No	Author and Title	Page.No
1.	Personality Profile Of Women Hockey Players – A Cross-Sectional Study At Various Levels Of Participation <b>Mayildevi. R and Dr.S.Manikandan</b>	1-9
2.	Effectiveness of Yoga Asanas Practices on Selected Physiological Variables among Middle Aged Women <b>Kasturi Damodaran Dr. V. Mahadevan Dr.T. Parasuraman and Dr. R. Ramakrishnan</b>	10-15
3.	Randomised control study on effect of ladder training programme on speed and acceleration among women volleyball players <b>Sumathy. S and Dr. M. Rajakumari</b>	16-22
4.	VOLLEYBALL IN KERALA: A study on WhatsApp Groups in promoting the game <b>Dr. Sandeep Sunny</b>	23-38
5.	Effect of functional training and plyometric training on selected strength vari-ables among volleyball players <b>Dr. R. Radhakrishnan</b>	39-47
6.	Effect of yogic practices on anxiety among low back ache men <b>Dr. I. Karikalan</b>	48-53
7.	Comparative Study on Team Cohesion among Volleyball Players <b>Dr.S. V. Arun</b>	54-62
8.	Impact of various physical training on physical fitness variables among school level khokho players <b>Mr.A.Thangamurugan</b>	63-71
9.	Effect of kettlebell training on selected physical variables among sports hostel women <b>D.Shanthi and Dr.S.Akila</b>	72-79
10.	Influence of physical exercise with hatha yoga practices on selected physio-logical variables among inter college level men volleyball players <b>Mr.A.Thanasingh</b>	80-87



## **Personality Profile of Women Hockey Players – A Cross-Sectional Study at Various Levels of Participation**

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### **Abstract**

Nowadays, widely accepted that psychological variables influence athletes' performance on the field, whether they are professionals or amateurs. This study's main objective is to describe the personality traits of women hockey players at different levels of participation. One hundred fifty female hockey players were selected for the study. The competitors were divided into three categories depending on the level of the tournaments they played. Based on the chosen study goals, fifty inter-district, fifty inter-university, and fifty inter-state hockey players. The participants' ages ranged from 18 to 25. The Eysenck Personality Questionnaire-Revised- Short Form is one of the condensed personality scales. The 48-item EPQR-S is divided into four subscales: neuroticism, extraversion, and psychoticism. The ANOVA results (Table 1) indicated a significant difference in personality ( $F(2,147) = 5.95, p = 0.003$ ), psychoticism ( $F(2,147) = 7.59, p = 0.001$ ), extraversion ( $F(2,147) = 10.11, p = 0.001$ ), neuroticism ( $F(2,147) = 3.81, p = 0.024$ ) scores among the three groups. In light of the differences between groups, inter-state level players had better personalities than other groups.

**Keywords:** Personality, psychoticism, extraversion, neuroticism, different levels of participation.

### **Introduction**

Sports performance is significantly influenced by an athlete's psychological make-up, which may also moderate and mitigate the effects of their tech-

nical, tactical, and physical skills. Given how much they might affect athletes' conduct during training and competition, various authors have un-

derlined the need to pay specific attention to these psychological traits. Nowadays, it is well acknowledged that psychological factors play a considerable role in sports performance for both professional and recreational players (Swann et al., 2017; Abdullah et al., 2016). In this way, some of the most important studies have found that physiological factors explain a sport's performance between 45 and 48%. Still, when psychological factors are added, that number goes up to between 79% and 85% in sports like wrestling (James et al., 2016).

There have been numerous approaches to examining the influence of psychological elements on athletic performance. They were comparing athletes' personality characteristics with non-athletes yields remarkably consistent statements. Typically, athletes are more extraverted, emotionally stable, and have a higher demand for productivity and excitement (Eysenck, Nias, & Cox, 1982). Schurr et al. (1977) found that team athletes were more outgoing, less dependent, and had higher abstract reasoning and self-strength than non-athletes. On the other hand, individual-sport athletes were more objective, dependent, less anxious, and had higher abstract

thinking than non-athletes. Athletes had higher conscientiousness scores than non-athletes, and athletes who played team sports had higher extraversion scores than athletes who played individual sports (Malinauskas et al., 2014).

Similarly, Steca et al. (2018) found that athletes with the most success in their careers scored higher on all big-five personality traits except openness to experience, compared to non-athletes and less successful athletes, except for extraversion and agreeableness. In addition, they found that athletes who did individual sports were more open and had more energy than athletes who did team sports. In the same way, Laborde et al. (2016) found that athletes had more positive personality traits than non-athletes and individual-sport athletes had more positive personality traits than team-sport athletes.

Several authors, such as Burnik et al. (2005), Rasmus and Kocur (2006), and Cabrita et al. (2014), have looked at how athletes' personalities affect how well they do in sports. Gee et al. (2007) found when they studied professional ice hockey players in North America (NHL) over 15 years. They found that competitiveness, self-



confidence, and an analytical mindset were significant predictors of how well the athletes did. Athletes that compete in individual sports tend to be dominant, independent, self-centred, and self-motivated; have high levels of self-control; are highly self-disciplined, and are responsible for their success or failure (Burnik et al., 2005).

Within the framework of our study, we attempted to determine and compare the personality characteristics of female hockey players at various levels of participation to support some previous studies and demonstrate that there are legitimate differences in the personality characteristics of the investigated groups. The primary goal of this study is to describe the personality characteristics of women hockey players at various levels of participation.

## **Materials and Methods**

### **Participants and Study Design**

For the study, 150 female hockey players were selected. The participants were divided into three groups according to the level of tournaments they participated in. Based on the chosen study researcher's objectives, fifty inter-district hockey players, fifty inter-university hockey

players, and fifty inter-state hockey players. The age range of the participants was 18 to 25 years. The investigation requirements have been made apparent to the team managers, coaches, and organizing secretaries of various competitions and to the individuals who compete in state, inter-university, and national tournaments in different regions of India. The researcher employed a purposive sampling method and a cross-sectional research design in this study.

### **Measures**

#### **Personality**

The Eysenck Personality Questionnaire-Revised- Short Form is one of the condensed personality scales (EPQR-S; Eysenck et al., 1985). The 48-item EPQR-S is divided into four subscales: neuroticism (12 items), extraversion (12 items), psychoticism (12 items), and lie (12 items). The lie subscale serves as a control scale when the full scale is tested for social desirability bias. Each question has two answers: "yes" or "no." Each dichotomous item had a 1 or 0; the maximum and lowest scores on each scale were 12 and 0, respectively.

---

## Procedure

The questionnaire for the study was administered by the researcher himself to the athletes. To acquire data, 150 female hockey players were given personality questionnaires. The investigator consulted with the involved coaches and players before giving the questionnaire. Data collection information and letters were given to coaches and term authorities well in advance, and date-specific data collection plans were created for each team. The data collection schedules were set to avoid interfering with the subjects' typical competitive regimens. The researcher educated the participants about the purpose of the study before providing the questionnaire, and then the questionnaire administration procedure was followed. The researcher described the meaning of each sentence to aid comprehension, and then everyone was given enough time to answer. The researcher clarified any remark that was not clear to the subjects. They were promised that their responses would be kept secret before collecting questionnaires from each individual. It will only be used for studying and nothing else. Their coaches were given the same promise. Individuals completed the surveys

between one and two hours before the matches. Participants completed the surveys one to two hours before the matches.

## Statistical Analysis

Descriptive statistics such as the mean and standard deviation of the scores were computed to summarise the collected raw data. One-way analysis of variance (ANOVA) was used to compare selected psychological variables of inter-district, inter-university, and inter-state women hockey players. If the f-value found significant differences between different levels of hockey players, the Post Hoc test (Tukey HSD, if Levene's test is significant, or Dunnett T3, if Levene's test is not significant) was used to compare paired means. At the .05 level, the significance of the hypothesis was examined. All statistical procedures were performed using the IBM SPSS Statistics 23.

## Results

The ANOVA results (Table 1) indicated a significant difference in personality ( $F(2,147) = 5.95, p = 0.003$ ), psychoticism ( $F(2,147) = 7.59, p = 0.001$ ), extraversion ( $F(2,147) = 10.11, p = 0.001$ ), neuroticism ( $F(2,147) = 3.81, p = 0.024$ ) scores



among the three groups. To check for individual differences between groups, post-hoc comparisons were assumed. The test indicated that the mean score of personality for inter-state level ( $M = 21.08$ ,  $SD = 2.73$ ) was significantly different ( $p < 0.05$ ) from inter-district level ( $M = 18.78$ ,  $SD = 3.44$ ). However, no significant differences between inter-university level ( $M = 20.03$ ,  $SD = 3.74$ ), inter-state and inter-district level women hockey players ( $p > 0.05$ ). In case of psychoticism, the test indicated that the mean score of psychoticism for inter-state level ( $M = 7.44$ ,  $SD = 1.54$ ) was significantly different ( $p < 0.05$ ) from inter-district level ( $M = 6.02$ ,  $SD = 1.97$ ), and inter-university level ( $M = 6.94$ ,  $SD = 1.99$ ) was significantly different ( $p < 0.05$ ) from inter-district level. However, no significant differences

between inter-state and inter-university level women hockey players ( $p > 0.05$ ). The mean score of extraversion for inter-state level ( $M = 7.80$ ,  $SD = 1.74$ ) was significantly different ( $p < 0.05$ ) from inter-district level ( $M = 6.20$ ,  $SD = 1.38$ ) and inter-university level ( $M = 7.34$ ,  $SD = 2.25$ ) was significantly different ( $p < 0.05$ ) from inter-district level. However, no significant differences between inter-state and inter-university level women hockey players ( $p > 0.05$ ). Finally, the mean score of extraversion for inter-state level ( $M = 5.84$ ,  $SD = 1.46$ ) was significantly different ( $p < 0.05$ ) from inter-district level ( $M = 6.56$ ,  $SD = 1.44$ ). However, no significant differences between inter-university level ( $M = 5.90$ ,  $SD = 1.40$ ), inter-state and inter-district level women hockey players ( $p > 0.05$ ).

**Table 1**

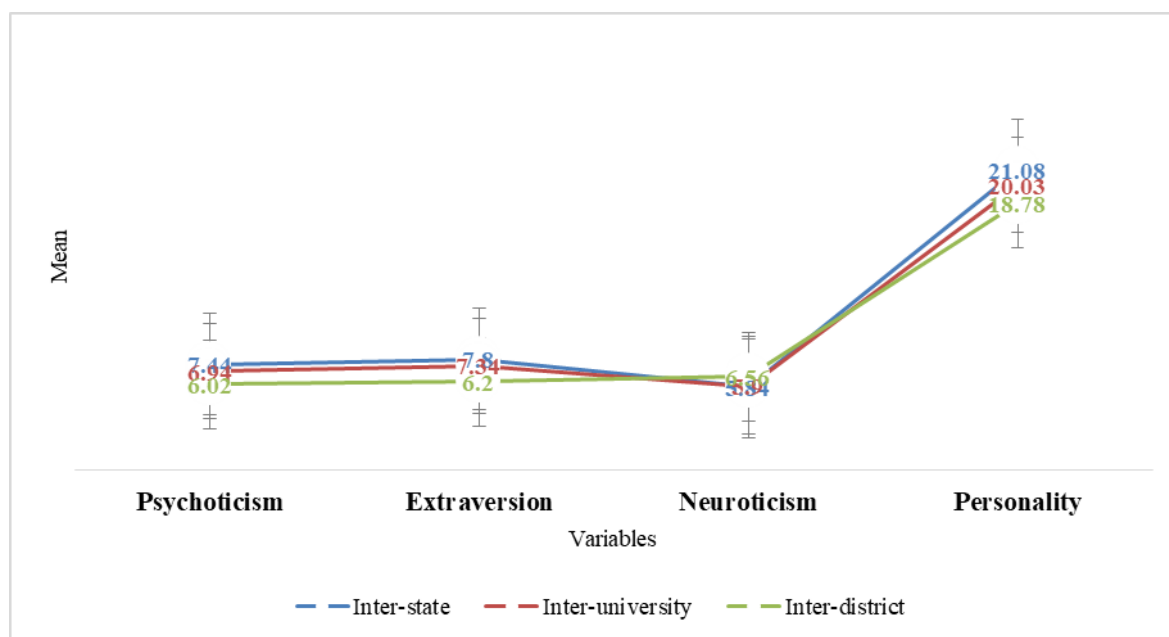
*One-Way Analysis results of study variables*

Variables	Level of participation (Mean+SD)			<i>F</i>	Sig.
	Inter-state	Inter-university	Inter-district		
Psychoticism	7.44+1.54	6.94+1.99	6.02+1.97	7.59*	0.001
Extraversion	7.80+1.74	7.34+2.25	6.20+1.38	10.11*	0.001
Neuroticism	5.84+1.46	5.90+1.40	6.56+1.44	3.81*	0.024
Personality	21.08+2.73	20.03+3.74	18.78+3.44	5.95*	0.003

Note. \*Significant level at 0.05.

**Figure 1**

*Mean of variables among groups.*



## Discussion

This study aims to describe the personality characteristics of women hockey players at various levels of participation, such as inter-state, inter-university and inter-district. The study reveals a significant difference between the three groups in total personality, psychoticism, extraversion, and neuroticism. The research conducted by Steca et al. (2018) found that athletes with the most success in their careers scored higher personality traits, except openness to experience. Piepiora (2021) reported that winners in individual sports were less neurotic and more outgoing when compared to other athletes. Athletes' mental tough-

ness varies depending on the sport. An athlete's level of neuroticism may influence how well they perform in a one-on-one athletic competition. According to Piepiora and Witkowski (2020), neuroticism and extraversion differed amongst combat sports. Each sport has a dominant dimension as well as different personality traits. The personalities of Brazilian Ju Jitsu athletes differ from those of other combat sports. Combat athletes each have their personality. Combat sports champions differ from ordinary martial artists in four ways. In light of the differences between groups, there are no significant differences between women hockey players competing at the inter-university, inter-state, and inter-district

levels and those competing at the inter-state and inter-district levels in terms of total personality and neuroticism.

Extraversion and psychoticism were significantly different at the inter-state level from the inter-district level and at the inter-university level from the inter-district level, according to the individual differences between groups. Still, there were no significant differences between women hockey players at the inter-state and inter-university levels. It reveals that those participating in handball and Kyokushin karate have varying levels of extraversion, openness to new experiences, and responsibility. Many athletes participating in contact sports are responsible and have average neuroticism and extraversion. In contact sports, neuroticism distinguishes the sexes (Piepiora & Petecka, 2020). According to several academics, elite volleyball players are less neurotic, more outgoing, and more diligent than those in the third division. Neuroticism, extraversion, and conscientiousness variations between volleyball players were statistically significant (Piepiora and Kaków, 2019).

## Conclusions

The study concludes that there is a significant difference between the three groups regarding personality, psychoticism, extraversion, and neuroticism. The individual differences between groups revealed no significant differences in the neuroticism and personality of women hockey players competing at the inter-university, inter-state, and inter-district levels compared to those competing at the inter-state and inter-district levels. The differences between groups demonstrate that extraversion and psychoticism were significantly different at the inter-state level from the inter-district level and at the inter-university level from the inter-district level. Still, there were no significant differences between inter-state and inter-university level women hockey players.

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#### **Funding**

This study was not funded by any grant

#### **Acknowledgements**

The authors would like to thank every participant for his effort and time.

#### **Conflict of interest**

None of the authors have any conflicts of interest to declare.

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#### **How to cite this Article**

**Mayildevi. R and Dr.S.Manikandan** Personality Profile of Women Hockey Players – A Cross-Sectional Study At Various Levels Of Participation. *Bharathiar National Journal of Physical Education and Exercise Sciences* 13(3) (2022) 01-09



## **Effectiveness of Yoga Asanas Practices on Selected Physiological Variables among Middle Aged Women**

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### **Abstract**

The purpose of this study was to find out effect of yoga practices on selected physiological variables among middle aged women. To achieve the purpose of the study thirty middle aged women participants were selected from Chennai, Tamil Nadu. The participants were randomly divided into two equal groups such as yoga asanas practice group (YAPG) and waiting group (WG). Pre test was conducted for YAPG and WG on selected criterion variables [Resting Pulse Rate (RPR) & Working Heart Rate (WHR)] selected for the study. YAPG underwent the respective training for 8 weeks. Immediately after the completion of 8 weeks training, all the subjects were measured of their post test scores on the selected criterion variables. All the results were test at p 0.05 level of significance. Paired Sample t test and ANCOVA were used to analysis the collected data at 0.05 level of significance. The difference between the initial and final scores was considered the effect of respective treatments.

Keywords: Yoga Asans Practicing Group (YAPG), Weighting Group (WG), Resting Pulse Rate (RPR) & Working Heart Rate (WHR).

### **INTRODUCTION**

Yoga is the science of right living and, as such, is intended to be incorporated in daily life. It works on all aspects of

the person: the physical, vital, mental, emotional, psychotic and spiritual. The word yoga means 'unity' or 'oneness'



and is derived from the Sanskrit word yuj, which means 'to join'. This unity or joining is described in spiritual terms as the union of the individual consciousness with the universal consciousness. On a more practical level, yoga is a means of balancing and harmonizing the body, mind and emotions, this is done through the practice of asana, pranayama, mudra, bandha, shatkarma and meditation, and must be achieved before union can take place with the higher reality.

The prime aim of yoga asanas practices is to help us tread the path to higher consciousness so we can begin to understand and know our relationship .with existence (Swami Satyaa-nanda Saraswati, 2013). Yoga is a mind and body practice that teaches us methods of coping with stress, finding presence, and becoming more self-aware. These are all things that are so important for every college student. The main component of asana practice is stretch of muscles. Muscle physiology has much to offer in terms of understanding benefits of muscle stretch. Here again, the stretch could be either slow or fast; further, the stretch could be maintained for a short period or not. (Srinivasan, 2016)

Yoga is typically regarded as a physical health practice, although yoga's roots are deeply philosophical and spiritual. Some have termed the physical health benefits "side effects" (Varambally & Gangadhar, 2012), while others have argued that yoga is a holistic system for improving mind, body, and spirit (Khalsa, 2007). Indeed, yoga's popularity may be due in large part to its ability to produce psychophysiological changes that reduce the activity of the stress response systems and enhance self-regulation, resilience, mood, well-being, and quality of life (Bussing et al., 2012; Park, et al., 2016). There are different approaches to yoga including spiritual, therapeutic, and developmental (Herrick & Ainsworth, 2000). However, the underlying premise of mind-body exercise modalities—like yoga—is that the physiological state of the body can affect emotions, thoughts, and attitudes, which in turn have a reciprocal affect on the body (Ives & Sosnoff, 2000). Yoga research has generally indicated a positive impact of yoga practice on a variety of outcomes, but much of the research has focused on disease rather than fitness-related outcomes (Raub, 2002; Cowen, & Adams, 2007). The existing evidence suggests that the

practice of yoga may be associated with an improvement in cardio-respiratory fitness (Prasad et al., 2001; Tran et al., 2001)

### METHODOLOGY

To achieve the purpose of the study 30 middle aged women were selected as subject from saithapet, Chennai, Tamil Nadu, India. Further selected subject divided into two group Group I underwent 8 weeks of Yogasana practice

### ANALYSIS OF DATA

Group (YAPG) and Group II act as waiting group (WG). Resting heart rate (RHR) and Working heart rate (WHR) were selected as criterion variables. Pre and post test randomised control group design used in this study. All the results were test at p 0.05 level of significance. Paired Sample t test and ANCOVA were used to analysis the collected data at 0.05 level of significance.

**TABLE - 1**  
**PAIRED SAMPLE T TEST ON CRITERION VARIABLE AMONG YAPG**

Variable	Test	Mean	N	SD	t	df	Sig. (2-tailed)
RHR	Pre-Test	63.00	15	1.07	14.38	14	.00
	Post Test	59.80	15	1.74			
WHR	Pre-Test	109.87	15	1.77	13.32	14	.00
	Post Test	107.00	15	1.65			

Table 1 reveal that the paired sample t test on YAPG RHR p value is  $0.00 < 0.05$  at 95% of confidence with df  $t_{(15)}$ . However paired sample t test on WHR p value is  $0.00 < 0.05$  at 95% of confidence with df  $t_{(15)}$ .

**TABLE - 2**  
**PAIRED SAMPLE T TEST ON CRITERION VARIABLE AMONG WG**

Variable	Test	Mean	N	SD	t	df	Sig. (2-tailed)
RHR	Pre-Test	62.12	15	0.99	0.721	14	0.48
	Post Test	62.17	15	1.18			
WHR	Pre-Test	62.53	15	1.46	0.000	14	1.00
	Post Test	62.53	15	1.46			

Table 2 reveal that the paired sample t test on CG RHR p value is  $0.48 > 0.05$  at 95% of confidence with df  $t_{(15)}$ . However paired sample t test on WHR p value is  $1.00 > 0.05$  at 95% of confidence with df  $t_{(15)}$ . The figure 1 shows the RHR and WHR mean values among middle age women

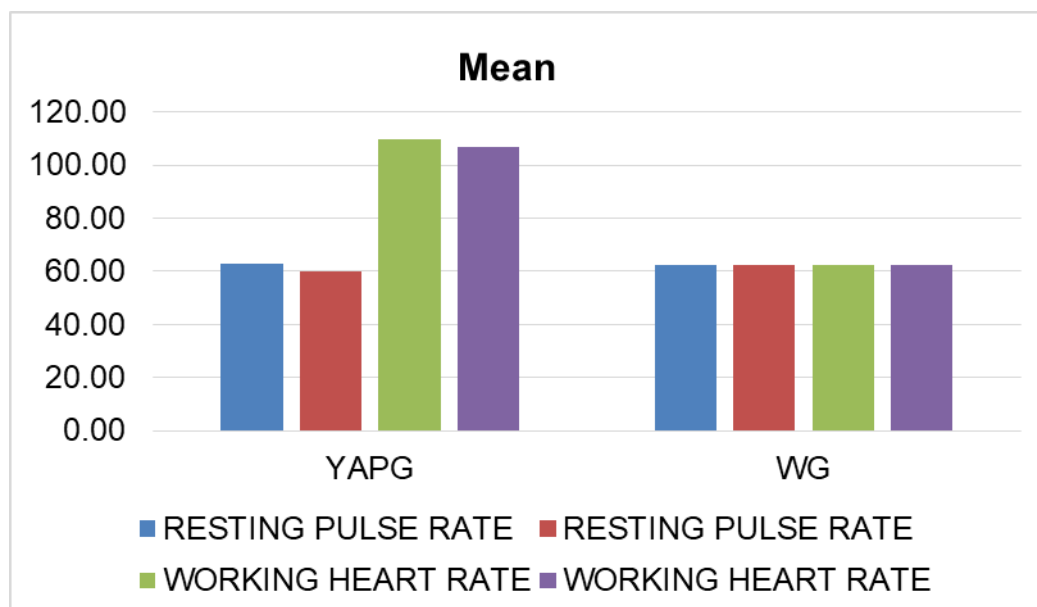
**TABLE - 3**  
**SHOWS THAT THE ANCOVA VALUES ON RHR AND WHR AMONG YAPG AND WG**

Variable	Adjusted Post Test Mean		Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
	YAPG	CG						
RHR	64.15	62.35	2.34	27	0.09	273.61	0.00	0.910
WHR	59.57	62.75	73.21	1	73.21	65.21	0.00	0.707
			30.31	27	1.12			

Table 3 reveal that the ANCOVA results on RHR p value is  $0.00 < 0.05$  at 95% of confidence with  $df_{(1,27)}$ . However ANCOVA results on WHR p value is  $0.00 < 0.05$  at 95% of confidence with  $df_{(1,27)}$ .

**FIGURE – 1**

**RHR AND WHR MEAN VALUES AMONG YAPG AND WG**



## DISCUSSION

### Paired sample t test results

The table 1 indicates that the  $P < 0.05$  which means statistical results had significant improvement on RHR and WHR among YAPG middle aged women due to the 8 weeks of YAP programme. However, table 2 indicates  $P > 0.05$  which denotes that the statistical results had no significant improvement on RHR and WRH among WG middle aged women.

### ANCOVA RESULTS

The table 3 indicates that the  $P < 0.05$  which means statistical results had significant improvement difference on RHR and WHR among YAPG middle aged women when compare with control group. Previous studies also support the present findings Devasena, & Narhare, (2011); Sarang, & Telles, (2006) & Cowen, & Adams, (2007).

## CONCLUSION

The outcomes of the study reflected that a significant improvement in differences at 0.05 level of significant. However within the group comparison revealed the significant changes from pre-test to post-test in the study variable. Therefore, it was concluded that there were significant mean differ-

ences on selected physiological variables of (RPR & WHR) to the effect of YAPG when compared with control group.

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#### Funding

This study was not funded by any grant

#### Acknowledgements

The authors would like to thank every participant for his effort and time.

#### Conflict of interest

None of the authors have any conflicts of interest to declare.

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#### How to cite this Article

**Kasturi Damodaran Dr. V. Mahadevan Dr. T. Parasuraman and Dr. R. Ramakrishnan**  
Effectiveness of yoga asanas practices on selected physiological variables among middle aged women. *Bharathiar National Journal of Physical Education and Exercise Sciences* 13(3) (2022) 10-15



## **Randomised Control Study on Effect of Ladder Training Programme on Speed and Acceleration among Women Volleyball Players**

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### **Abstract**

Aim of this randomised control study used to find the impact of ladder training programme on speed and acceleration among women volleyball players. For these 30 women volleyball players were selected as sample by simple random sampling methods. Further, samples divided as Ladder training group (LTG) and Control Group (CG) each consist of 15 women Volleyball players. Speed and acceleration were selected as criterion variables. Dependent t test and Analysis of covariance were used to analysis the data at 0.05 level of significance. The results show  $p < 0.05$  it indicates there is significance improvement on speed and acceleration among women volleyball players.

**Key word:** Ladder training, Speed, Acceleration, Women Volleyball Players.

### **Introduction**

Volleyball is a widely played activity that is in third place among recreational team sports (Palanisamy, 2019). Around 70 years ago, physical education instructors introduced volleyball to India (Mahadevan, 2018). Analysis of volleyball training exercises reveals that young athletes' early technical and tactical preparedness plays a significant role in the effectiveness of the game. The tech-

nical and tactical element is crucial because it enables the player to effectively conduct motor actions like speed and acceleration by enabling timely perception and adequate assessment of the game circumstances (Palao, & Valades, 2016; Boichuk et al. 2017; Ramakrishnan, & Sethu, 2018; Boichuk et al. 2019). Different exercises are used during ladder training to hone the motor



movement. ladder training is a multidirectional kind of exercise strength, power, balance, agility, coordination, proprioception, core and joint stability, foot speed, hand-eye coordination, response time, and mobility, every element needs to be included in the daily training session. Teaching movement skills using ladders is

### Methodology

To obtain the intent of this study N = 30 samples were selected as subjects for this pre and post test randomised study. The samples of this study are women volleyball players. Further samples allocated into two groups. Group I Ladder Training Group (LTG) and Group II as Control Group (CG) with 15 samples each Speed and acceleration ability were selected as criterion variables. LTG underwent 8 weeks of ladder training programme. Samples underwent 3 session per week (alternative days Monday,

enjoyable and practical. The mind and body can learn to recognise a variety of foot combinations via training (Brown, & Ferrigno, 2014). This present study intends to find the effectiveness of 8 weeks ladder training on speed and acceleration among the women volleyball players.

Wednesday, and Friday). All the session in morning session only. Control group didn't participate any special training programme during these 8 weeks of periods.

### Statistical Analysis

Collected data were analysed with dependent t test to check the improvement between pre and post test and Analysis of Covariance (ANCOVA) used to find the improvement difference between LTG and CG. All the statistical results were test at P 0.05 level.

### Results

Table 1 Dependent t test on Speed among LTG and CG

Group	Test	Mean	N	Std. Deviation	t	df	Sig. (2-tailed)
LTG	Pre Test	5.100	15	0.08	23.66	14	.00
	Post Test	4.700	15	0.11			
CG	Pre Test	5.13	15	0.08	.367	14	.72
	Post Test	5.12	15	0.09			

Table 1 shows the statistical results of LTG and CG on Speed. The obtained p value of LTG on speed is  $0.00 < 0.05$  level of significant. And the obtained p value of CG on speed is  $0.72 > 0.05$  level of significant. The figure 1 represent the mean value of speed between LTG and CG.

Figure 1: LPG and CG mean value of speed

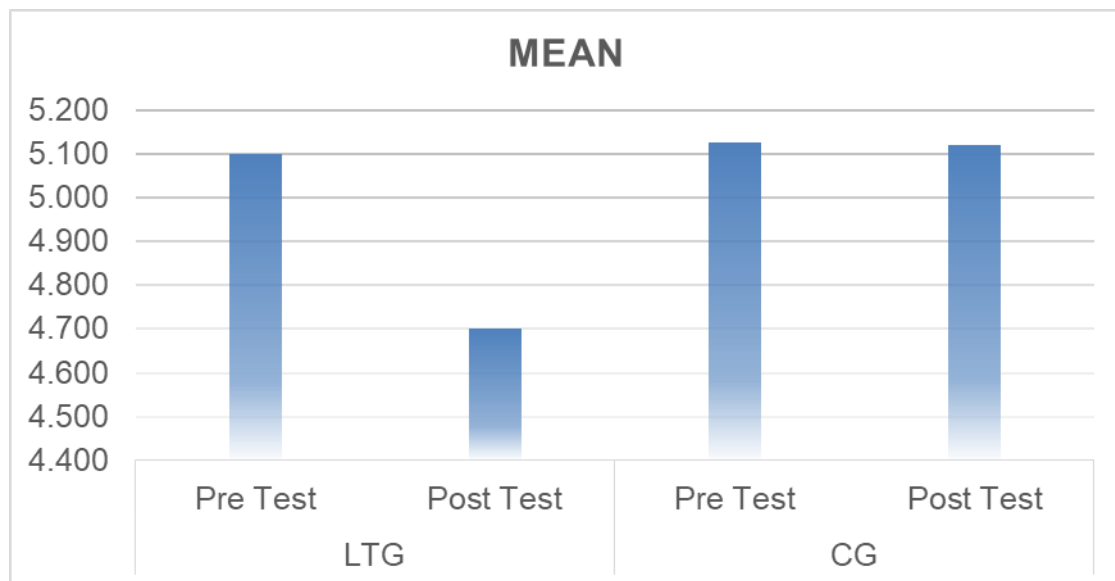


Table 2 Dependent t test on Acceleration among LTG and CG

Group	Test	Mean	N	Std. Devia- tion	t	df	Sig. (2- tailed)
LTG	Pre Test	4.567	15	0.12	12.58	14	.00
	Post Test	4.287	15	0.10			
CG	Pre Test	4.61	15	0.10	.899	14	.38
	Post Test	4.59	15	0.13			

Table 2 shows the statistical results of LTG and CG on Acceleration. The obtained p value of LTG on acceleration is  $0.00 < 0.05$  level of significant. And the obtained p value of CG on acceleration is  $0.38 > 0.05$  level of significant. The figure 2 represent the mean value of acceleration between LTG and CG

Figure 2: LPG and CG mean value of acceleration

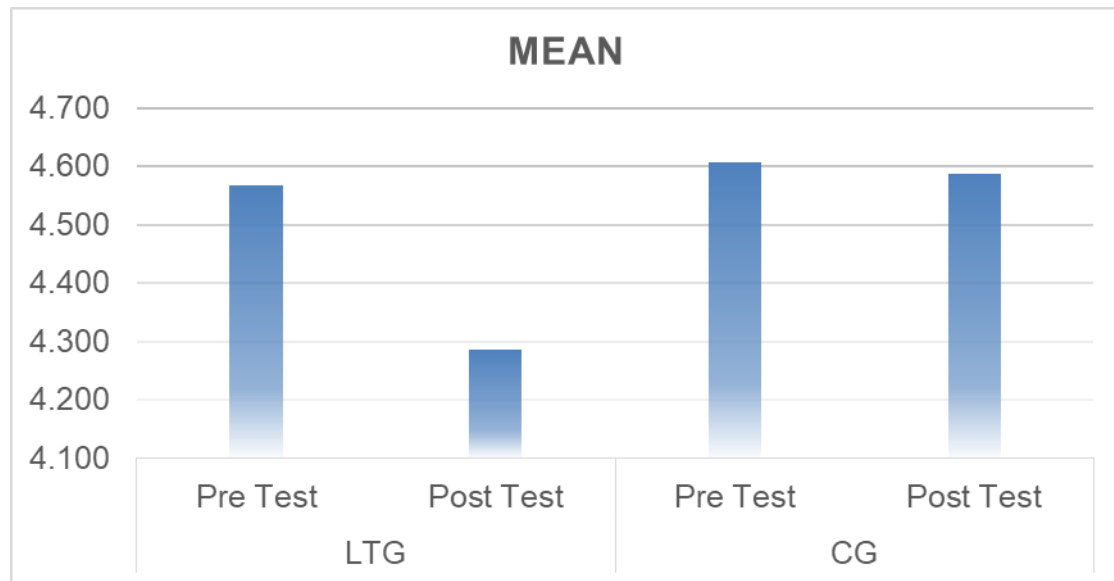


Table 3 Shows that the ANCOVA values on Speed between LPG and CG

Adjusted Post-test Mean		Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
LTG	CG	1.143	1	1.143	241.495	.000	.899
4.712	5.108	.128	27	.005			

Table 3 shows the ANCOVA statistical results of LTG and CG on Speed. The obtained p value of LTG on speed is  $0.00 < 0.05$  level of significant.

Table 4 Shows that the ANCOVA values on Acceleration between LPG and CG

Adjusted Post-test Mean		Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
LTG	CG	.532	1	.532	79.194	.000	.746
4.301	4.572	.182	27	.007			

Table 4 shows the ANCOVA statistical results of LTG and CG on Acceleration. The obtained p value of LTG on acceleration is  $0.00 < 0.05$  level of significant.

## Discussion

Table 1: Statistical results indicates ( $P < 0.05$ ) there is significant improvement between pre and post test mean on speed due to the 8 weeks of Ladder Training programme among women volleyball players. And control group ( $P > 0.05$ ) there is no significant improvement between pre and post test mean on speed.

Table 2: Statistical results indicates ( $P < 0.05$ ) there is significant improvement between pre and post test mean on acceleration due to the 8 weeks of Ladder Training programme among women volleyball players. And control group ( $P > 0.05$ ) there is no significant improvement between pre and post test mean on acceleration.

Table 3: Statistical results indicates ( $P < 0.05$ ) there is significant improvement difference between LPG & CG on speed due to the 8 weeks of Ladder Training programme among women volleyball players.

Table 4: Statistical results indicates ( $P < 0.05$ ) there is significant improvement difference between LPG & CG on acceleration due to the 8 weeks of Ladder Training programme among women volleyball players.

The present study results also supported by previous evidence studies Goloborodko et al. (2018); Palanisamy, (2019); Boichuk, et al., (2017); Fatchurrahman, et al., (2019); Boichuk, et al. (2020); Padron-Cabo, et al., (2020); Alviana, et al., (2020); Kumar, & Kumar, (2020); Siantoro, & Khamidi, (2020).

## Conclusion

The statistical results proved that the 8 weeks of Ladder training programme among the women volleyball players influence to develop their motor abilities such as speed and acceleration. The group involved in the training programme they are better in speed and acceleration when compare with the CG.

Based on the statistical results we recommend the coaches; physical educators use ladder training programme to improve the various factors to achieve the high level of performance in different sports.

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**Funding**

This study was not funded by any grant

**Acknowledgements**

The authors would like to thank every participant for his effort and time.

**Conflict of interest**

None of the authors have any conflicts of interest to declare.

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**How to cite this Article**

**Sumathy. S and Dr. M. Rajakumari** Randomised control study on effect of ladder training programme on speed and acceleration among women volleyball players. Bharathiar National Journal of Physical Education and Exercise Sciences 13(3) (2022) 16-22





## **Volleyball in Kerala: A Study on WhatsApp Groups in Promoting the Game**

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### **Abstract**

The main objective of the study is to find out the impact of Whatsapp of volleyball on game promotion. A total of 10 active groups participated in the survey using an online method (Google form) regarding professional, personal and community relationship (OPR scale). The collected data was analysed with the help of Descriptive statistics, Kruskal Wallis H test and Post hoc Steel Dwass test. As per the values obtained Information about tournaments, direct contact with game professionals and organizing tournaments and conducting interviews with coaches and players were the only main activities in the group. Study also tries to find out difference between dependent variables on different characteristics of whatsapp group, results on professional, personal and community relationship shows significant difference in all the characteristics of whatsapp group (locality, no. of members, period and identity) except personal relationship on locality. Results shows the relationship between group members was not up to the mark to develop the standard of the game to the Olympic standard even though there are all types of members from players, coaches, fans and association members. Strategies and plans should be practiced out systematically for the development of the game.

**Key words:** professional, personal and community relationship (OPR,).

### **INTRODUCTION**

Without a doubt, we are in the centre of a monumental technological paradigm shift, the increasing time, scope, and frequency of use, internet technologies have started to shape the way people form and share

content and their way of communication. Social networks, which are very popular among young people, are becoming prevalent due to their nature to meet the needs of individuals towards socialization. Obviously, social media is one of the most

important tools for sports, the fans and the athletes. First of all, as we know, the population of social media users has increased dramatically over the past years. People can engage in the sports, follow their favourite athletes and teams, and get the most updated sports contents instantaneously. Second, for sports organizations, the advantages of using social media is that, it can help the organizations to build relationships with the public, to reduce their marketing costs and to increase sales etc. Organizations can use social media to promote two-way conversations with the public and build a community under their mission. Third, social media has got attraction as an essential tool for connecting with sports fans. For individual sports fans, social media is a very important tool for them to interact and share information with other individuals, to engage in two-way communication with sports organizations. Finally, athletes can benefit from using social media to connect with their fans, to build a personal brand and to promote themselves etc. Compared with the traditional media, the social media nowadays costs less but affects more efficiently and more consistently. Just one post per day could make the athlete active in his/her fans' sights, which will bring corresponding

economic benefits. Besides, the athlete himself/herself may enjoy more while sharing their sports relevant updates, which will certainly lead to a sustainable development.

In recent years, communication via mobile messaging applications (such as LINE, INSTAGRAM, in particular WhatsApp...) has gained increasing popularity among young users. Their nature that focuses on individuals, started to shape users' process of interaction and has The Impact of Whatsapp Use on Success in Sports promotion become one of the important elements of the daily life.

All in all, social media is still at its infancy and will continue to grow, and the engagement of social media in sports is one of the most significant issues in the sports industry. The sports fans and athletes, as well as sports organizations are embracing social media as the most important tools to promote, to communicate and to interact. In this study

Volleyball is a game played widely across the country which has been a part of the Indian sporting conscience for more than seven decades. Whilst an Indian team has never participated at an Olympic Games, the country has enjoyed some success at

regional level. Though it was informally played for a long time, the first interstate volleyball championships were held by the Indian Olympic Association (IOA) in 1936 in pre-independent India. The sport gained proper structure with the formation of the Volleyball Federation of India (VFI) in 1951. Though volleyball is played widely across the country, the southern state of Kerala has been the true powerhouse of the game producing generations of volleyball players for the Indian team. Infact, two years ago, almost the entire Indian women's volleyball team for the Jakarta Asian Games hailed from Kerala. Even the men's team at Jakarta had four players from Kerala. Kerala has been at the forefront of many sporting revolutions in India, be it football, athletics, snake boat racing. Similarly, volleyball remains to be a popular activity in the state. In almost every city, villages or suburbs one would see young people engaged in playing volleyball as one of their favourite past-time activities. But unfortunately suspension of VFI by FIVB has changed the present scenario, the career of current players and upcoming talents in this sport are highly affected. Now players, coaches, fans and

association members made their sincere efforts to sort it out. They are using social media, especially whatsapp to communicate and making relationship for the betterment of the game. In this context I made a humble attempt to analyse their whatsapp group relation activities of volleyball.

### **Materials & Methods:**

The main objective of the study is to find out the impact of whatsapp on game promotion. A total of 10 active groups participated in the survey using an online method (Google form) regarding professional, personal and community using OPR scale (Ledingham 2003).

### **Research Design and Statistical technique employed:**

The research design adopted for this study is static group comparison design. The collected demographic data's was interpreted using Descriptive statistics like mean, SD, frequency and percent. Kruskal Wallis and Post hoc Steel Dwass test was used to compare the independent with dependent variables and their pair wise differences. Testing of hypothesis level of significance was set at 0.05 levels.

## RESULTS

## FREQUENCIES &amp; PERCENT OF INDEPENDENT VARIABLES

Sl No	Variable	Frequency	Percent
1.	<b>Whatsapp Groups</b>		
	a. Air Force Volleyball Veterans	18	5%
	b. Kerala Volleyball Lovers	18	5%
	c. PDVBA	36	10%
	d. Vayanaden Volley Friends	18	5%
	e. VoliQ	72	20%
	f. VolleyKerala	72	20%
	g. Volleylive 1	72	20%
	h. VolleyLive 2	18	5%
	i. Volleylive 3	18	5%
	j. Yes	18	5%
2.	<b>Age Category</b>		
	a. 19- 25 yrs	108	30%
	b. 26-35 yrs	90	25%
	c. 36-45 yrs	108	30%
	d. 46- 55 yrs	18	5%
	e. Above 55 yrs	36	10%
3.	<b>Locality</b>		
	a. Corporation	18	5%
	b. Municipality	162	45%
	c. Village	180	50%
4.	<b>Period</b>		
	a. 1-3 yrs	54	15%
	b. 3-5 yrs	144	40%
	c. 5-8 yrs	90	25%
	d. Above 8 yrs	72	20%
5.	<b>Identity</b>		
	a. General member	90	25%
	b. Club member	144	40%
	c. Association member	72	20%
	d. Coach/player	54	15%

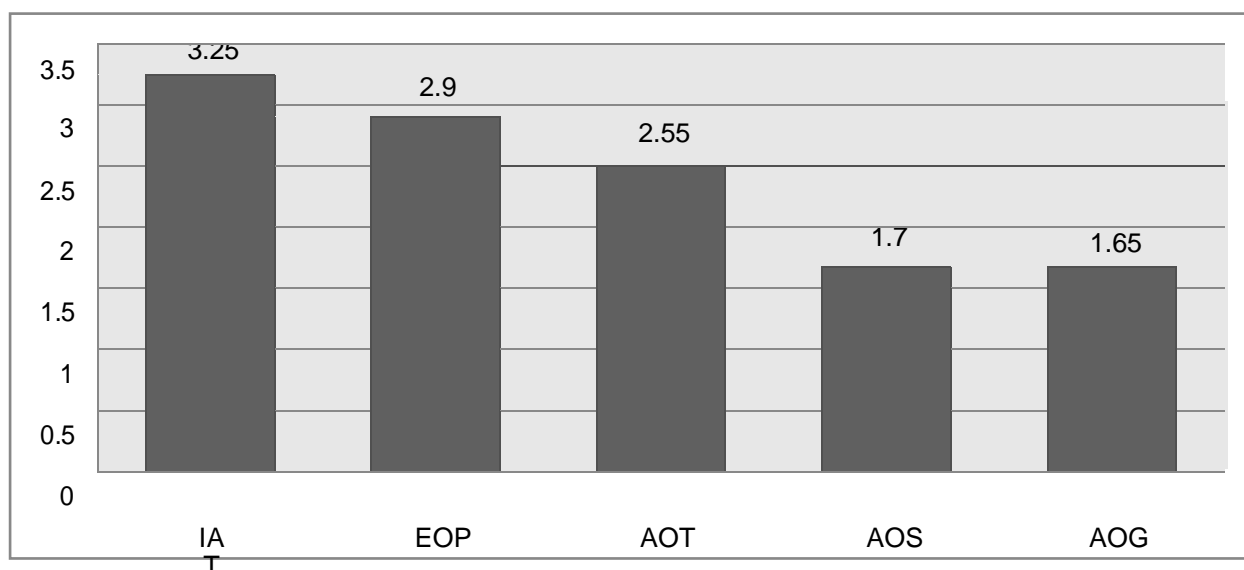
The above table shows frequencies and percentages of independent variables data set collected in the study

TABLE II

## DESCRIPTIVE OF GROUP PROFESSIONAL RELATIONSHIP

Areas Evaluated	N	M	CM	SD	CSD
Information about tournaments	360	3.25		.830	
Evaluation of performance	360	2.90		.701	
Advertisement of tournaments	360	2.55	11.99	1.073	2.882
Advertisement of sponsors	360	1.70		1.189	
Advertisement of sports goods and wears	360	1.65		1.154	

DIAGRAM I- MEAN SCORES OF GROUP PROFESSIONAL RELATIONSHIP



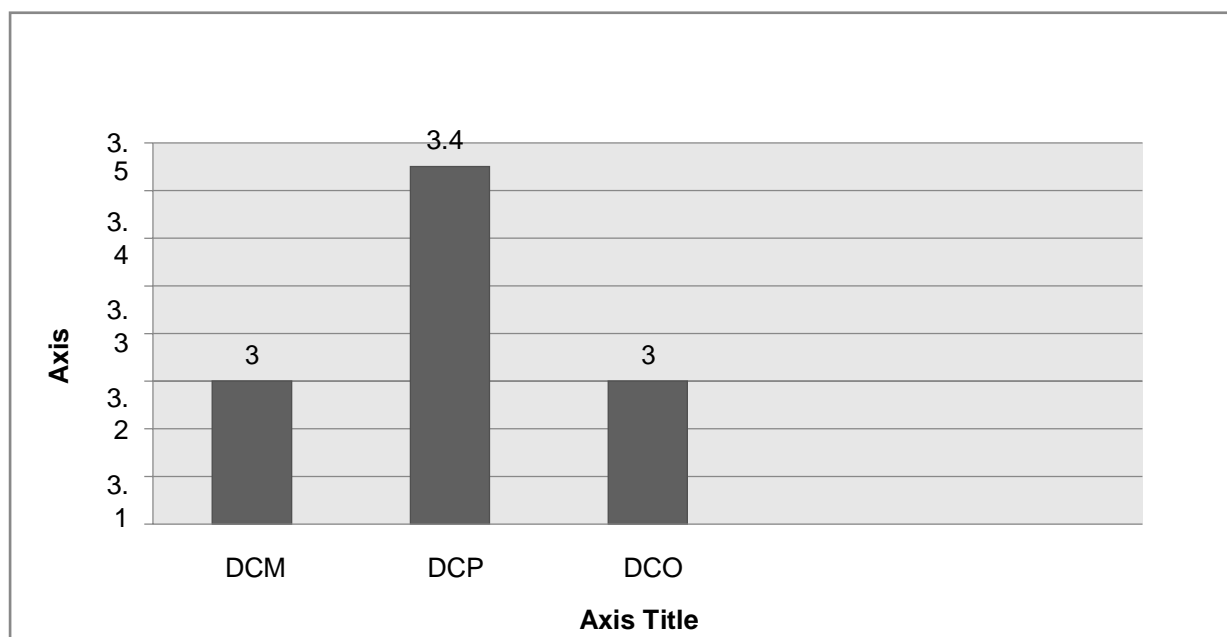
**Description:** The above table shows the M, CM, SD and CSD of respective areas come under group professional relationship. The table shows Information about tournaments has highest mean score and Advertisement of sports goods and wears as lowest mean score.

TABLE III

## DESCRIPTIVE OF GROUP PERSONAL RELATIONSHIP

Areas Evaluated	N	M	CM	SD	CSD
Direct contact with news media	360	3.00		.896	
Direct contact with game professionals	360	3.45	9.59	.806	2.210
Direct contact with tournament organizers and sponsors	360	3.00		.981	

DIAGRAM II- MEAN SCORES OF GROUP PERSONAL RELATIONSHIP



**Description:** The above table shows the M, CM, SD and CSD of respective areas come under group personal relationship. The table shows direct contact with game professionals has highest mean score.

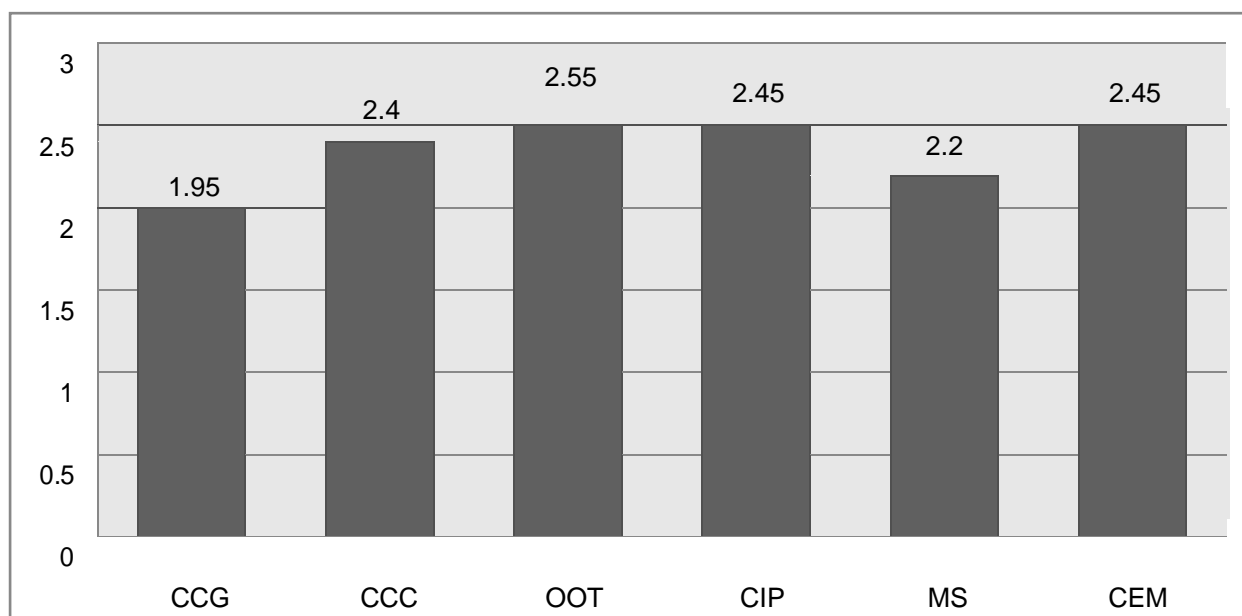


TABLE IV

## DESCRIPTIVE OF GROUP COMMUNITY RELATIONSHIP

Areas Evaluated	N	M	CM	SD	CSD
Conduct courses/workshops/symposium of game	360	1.95		1.073	
Conduct coaching camps	360	2.40		.971	
Organising tournaments	360	2.55	13.93	1.285	5.144
Conduct interviews of elite coaches and players	360	2.45		.975	
Monetary support	360	2.20		1.079	
Conduct evaluation meetings	360	2.45		1.073	

DIAGRAM II- MEAN SCORES OF GROUP COMMUNITY RELATIONSHIP



**Description:** The above table shows the M, CM, SD and CSD of respective areas come under group personal relationship. The table shows organizing tournaments and conducting interviews with coaches and players has highest mean score and conducting refresher, seminar and symposium to coaches, trainers, teachers and players show low mean scores.

TABLE V

## KRUSKAL WALLIS TEST OF LOCALITY

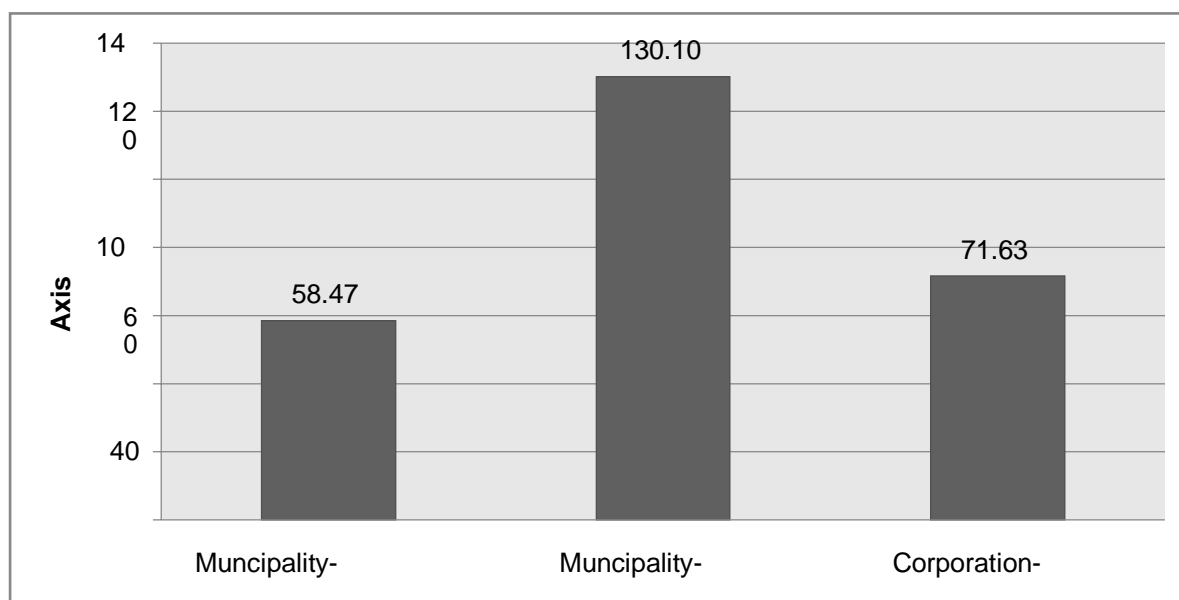
Dependent Variables	Locality	N	Mean Rank	$\chi^2$	r
Group professional relationship	Corporation	18	171.00	143.465	.000
	Municipality	162	112.52		
	Village	180	242.63		
Group personal relationship	Corporation	18	224.50	3.710	.156
	Municipality	162	175.85		
	Village	180	180.28		
Group community relationship	Corporation	18	136.00	15.174	.001
	Municipality	162	163.23		
	Village	180	200.49		

TABLE V a

## POST HOC STEEL DWASS TEST OF LOCALITY

Sample 1- Sample 2	Test statistic	Std. Error	Std test statistic	Sig.	Adj. Sig
Municipality- Corporation	58.478	24.935	2.345	.019	.057
Municipality-Village	-130.109	10.869	-11.971	.000	.000*
Corporation- Village	-71.631	24.810	-2.887	.004	.012*

## DIAGRAMMATIC REPRESENTATION POST HOC TEST OF LOCALITY



**Description:** Above table K-W test indicates a significant difference in the Group professional relationship and Group community relationship with residing locality of members in whatsapp groups as scores of them were [ $\chi^2=143.456$ ,  $p=.000<0.05$ ], [ $\chi^2=15.174$ ,  $p=.001<0.05$ ]. In this case null hypothesis rejected where as Group personal relationship has no significant difference with residing locality of members in whatsapp groups as there score are [ $\chi^2=3.710$ ,  $p=.156>0.05$ ]. In this case null hypothesis were retained. The Post hoc showed no significant difference between municipality - corporation, however significant difference found between municipality-village and corporation-village in connection with residing locality of the members in whatsapp groups.

TABLE VI

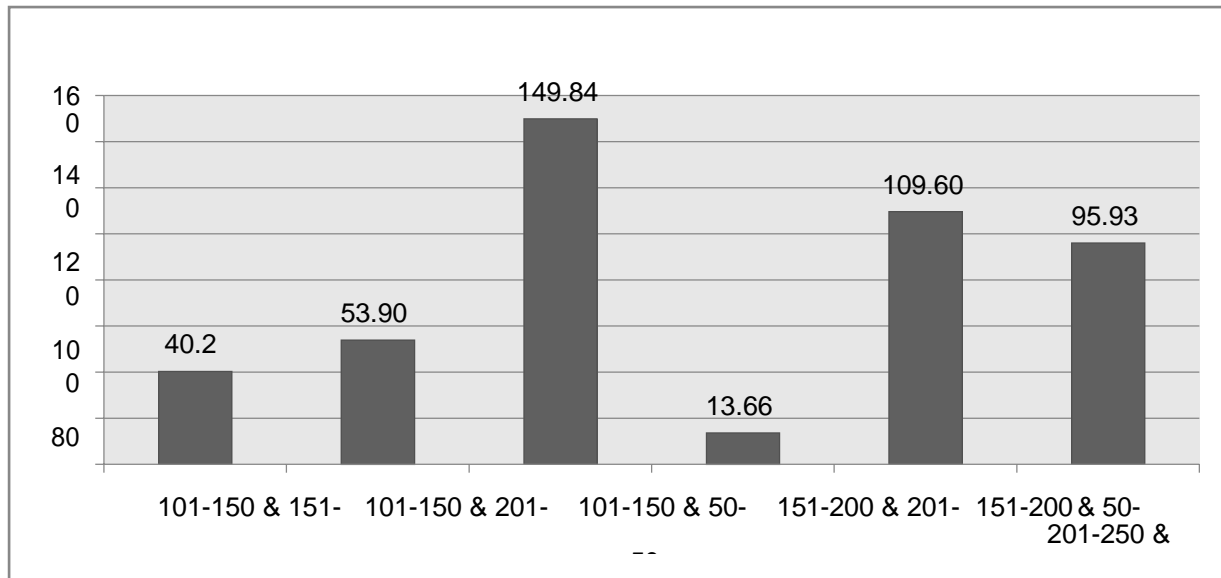
## KRUSKAL WALLIS TEST OF MEMBERS

Dependent Variables	Members	N	Mean Rank	$\chi^2$	r
Group professional relationship	50-100 members	54	300.46	101.742	.000
	101- 150 members	252	150.62		
	151- 200 members	18	190.86		
	201- 250 members	36	204.56		
Group personal relationship	50-100 members	54	312.61	137.689	.000
	101- 150 members	252	145.51		
	151- 200 members	18	144.97		
	201- 250 members	36	245.01		
Group community relationship	50-100 members	54	299.53	97.247	.000
	101- 150 members	252	151.22		
	151- 200 members	18	191.78		
	201- 250 members	36	201.26		

TABLE VI a

## POST HOC STEEL DWASS TEST OF MEMBERS

Sample 1- Sample 2	Test statistic	Std. Error	Std test statistic	Sig.	Adj. Sig
101-150 & 151-200 Group	-40.240	24.486	-1.643	.100	.602
101-150 & 201-250 Group	-53.907	17.882	-3.015	.003	.015
101-150 & 50-100 Group	149.842	15.050	9.956	.000	.000
151-200 & 201-250 Group	-13.667	28.972	-.472	.637	1.000
151-200 & 50-100 Group	109.602	27.315	4.012	.000	.000
201-250 & 50-100 Group	95.935	21.595	4.443	.000	.000

**DIAGRAMMATIC REPRESENTATION POST HOC TEST OF MEMBERS**

**Description:** Above table K-W test indicates a significant difference in the Group professional relationship, Group personal relationship and Group community relationship with members in whatsapp groups, as scores of them were [ $\chi^2=101.742$ ,  $p=.000<0.05$ ], [ $\chi^2= 137.689$ ,  $p=.000<0.05$ ] and [ $\chi^2= 97.247$ ,  $p=.000<0.05$ ] In all this case null hypothesis rejected. The above Post hoc showed significant difference in four categories of members where as two groups didn't show any difference.

**TABLE VII****KRUSKAL WALLIS TEST OF PERIOD**

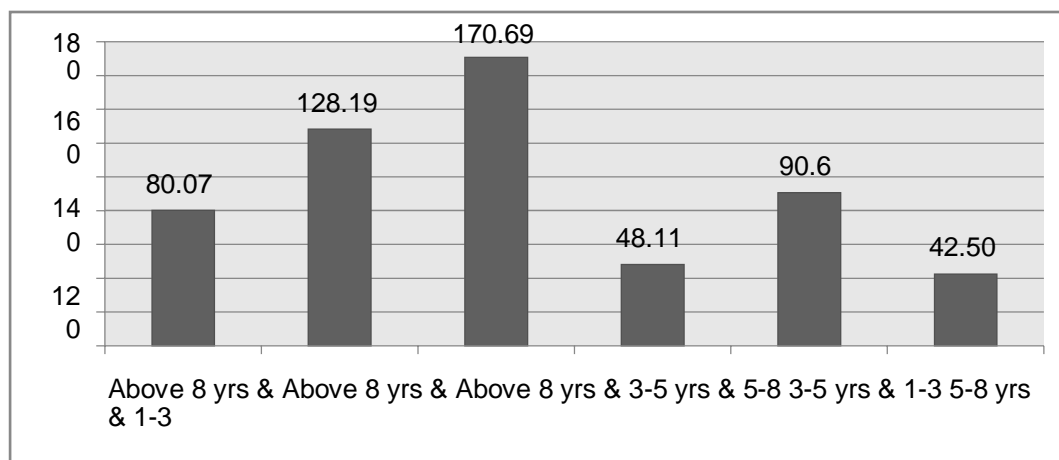
Dependent Variables	Period	N	Mean Rank	$\chi^2$	r
Group professional relationship	1-3 yrs	55	261.12	107.756	.000
	3-5 yrs	144	170.50		
	3-8 yrs	89	218.62		
	Above 8 yrs	72	90.42		
Group personal relationship	1-3 yrs	55	254.63	108.845	.000
	3-5 yrs	144	188.89		
	3-8 yrs	89	90.67		
	Above 8 yrs	72	216.66		
Group community relationship	1-3 yrs	55	251.31	53.839	.000
	3-5 yrs	144	172.29		
	3-8 yrs	89	129.73		
	Above 8 yrs	72	204.08		

TABLE VII a

## POST HOC STEEL DWASS TEST OF PERIOD

Sample 1- Sample 2	Test statistic	Std. Error	Std test statistic	Sig.	Adj. Sig
Above 8 yrs & 3-5 yrs	80.076	14.442	5.545	.000	.000
Above 8 yrs & 5-8 yrs	128.194	15.860	8.082	.000	.000
Above 8 yrs & 1-3 yrs	170.697	18.012	9.477	.000	.000
3-5 yrs & 5-8 yrs	-48.118	13.491	-3.567	.000	.002
3-5 yrs & 1-3 yrs	90.620	15.966	5.676	.000	.000
5-8 yrs & 1-3 yrs	42.502	17.259	2.463	.014	.083

## DIAGRAMMATIC REPRESENTATION POST HOC TEST OF PERIOD



**Description:** Above table K-W test indicates a significant difference in the Group professional relationship, Group personal relationship and Group community relationship with members in whatsapp groups, as scores of them were [ $\chi^2=107.756$ ,  $p=.000<0.05$ ], [ $\chi^2= 108.845$ ,  $p=.000<0.05$ ] and [ $\chi^2= 53.839$ ,  $p=.000<0.05$ ] In all this case null hypothesis rejected. The Post hoc test a significant difference showed between all the periods where the group created except one period.

TABLE VIII

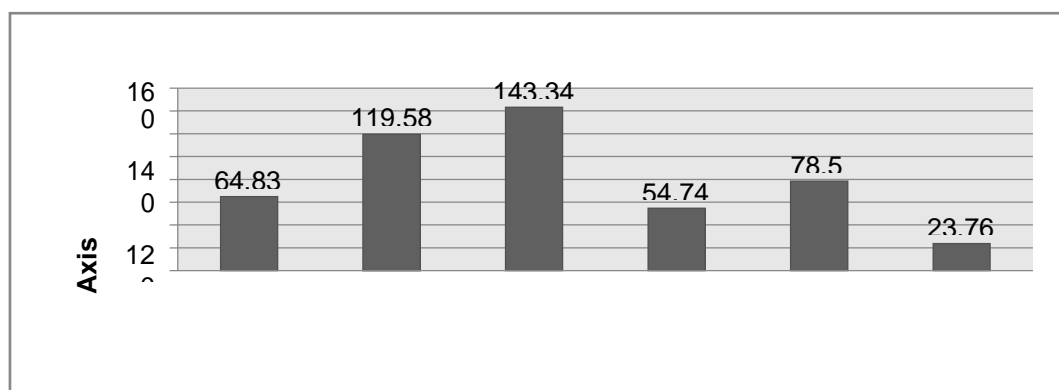
## KRUSKAL WALLIS TEST OF IDENTITY

Dependent Variables	Identity	N	Mean Rank	$\chi^2$	r
Group professional relationship	General member	90	215.58	79.558	.000
	Club member	144	160.84		
	Association member	72	239.35		
	Coaches/Players	54	96.00		
Group personal relationship	General member	90	235.10	88.401	.000
	Club member	144	137.57		
	Association member	72	237.33		
	Coaches/Players	54	128.20		
Group community relationship	General member	90	212.76	60.347	.000
	Club member	144	166.53		
	Association member	72	227.52		
	Coaches/Players	54	101.28		

## POST HOC STEEL DWASS TEST OF IDENTITY

Sample 1- Sample 2	Test statistic	Std. Error	Std test statistic	Sig.	Adj. Sig
Coach/players & Club member	64.837	16.015	4.049	.000	.000
Coach/players & Gen. member	119.583	17.276	6.922	.000	.000
Coach/players & Assco. member	143.347	18.067	7.934	.000	.000
Club member & Gen member	54.747	13.486	4.060	.000	.000
Club member & Assco. member	-78.510	14.486	-5.420	.000	.000
Gen member & Assco. member	-23.764	15.869	-1.498	.134	.806

## DIAGRAMMATIC REPRESENTATION POST HOC TEST OF PERIOD





**Description:** Above table K-W test indicates a significant difference in the Group professional relationship, Group personal relationship and Group community relationship with members identity in whatsapp groups, as scores of them were [ $\chi^2=79.558$ ,  $p=.000<0.05$ ], [ $\chi^2= 88.401$ ,  $p=.000<0.05$ ] and [ $\chi^2= 60.347$ ,  $p=.000<0.05$ ] In all this case null hypothesis rejected. The above Post hoc test a significant difference showed between all the identities of the group members except one group.

### Discussion

In step one the study try to find out professional, personal and community relationship between ten whatsapp groups of volleyball comprising- present and past players, coaches, fans and association members as shown in percentages in table 1. Table 2, 3 and 4 find out the most preferred activities done by the groups to create professional, personal and community relationship. As per the values obtained Information about tournaments, direct contact with game professionals and organizing tournaments and conducting interviews with coaches and players were only the main activities in the groups when compared to many other parameters which actually needed for the development of the game.

In step two the study tries to find out difference between personal, professional and community relationship (dependent variables) on different characteristics of whatsapp group such as locality of group member residing,

no. of members in each groups, period from they were members of the concerned groups and identity of the group members, results reveals all the dependent variables (professional and community relationship) shows significant difference in all the characteristics of whatsapp group (locality, no. of members, period and identity) except locality in personal relationship.

### Conclusion

As stated in the introduction, the Impact of Whatsapp Use on success in Sports promotion become one of the important elements of the daily life. The suspension of VFI by FIVB has changed the present scenario, the career of current players and upcoming talents in this sport are highly affected. Now players, coaches, fans and association members made their sincere efforts to sort it out. They are using social media, especially whatsapp to communicate and making relationship for the betterment of the game.

In order to examine the relationships typology between sports organizations and their publics and how they used social media to develop these relationships, I used organization-public relationship as the key theoretical framework. Organization-public relationship can be defined as "the patterns of interaction, transaction, exchange, and linkage between an organization and its publics" (Broom, Casey, & Ritchey, 2000, p. 18). According to Ledingham and Bruning (1998), it is the state existing between an organization and its key publics, in which the actions of one party can affect the economic, social, cultural or political well-being of the other. Results shows the relationship between group members was not up to the mark to develop the standard of the game to the Olympic standard even though there are all types of members from players, coaches, fans and association members. Strategies and plans should be practiced out systematically for the development of the game..

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### **Funding**

This study was not funded by any grant

### **Acknowledgements**

The authors would like to thank every participant for his effort and time.

### **Conflict of interest**

None of the authors have any conflicts of interest to declare.

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### **How to cite this Article**

**Dr.Sandeep Sunny** VOLLEYBALL IN KERALA:  
A study on WhatsApp Groups in promoting the game. *Bharathiar National Journal of Physical Education and Exercise Sciences* 13(3) (2022) 23-38



## **Effect of Functional Training and Plyometric Training on Selected Strength Variables among Volleyball Players**

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### **Abstract**

The purpose of the study was to find out the effect of functional training and plyometric training on selected strength variables among volleyball players. To achieve the purpose of the present study, Forty five male volleyball players were randomly selected from Chennai district, Tamil Nadu, were randomly selected their age ranged between 18 to 25 years. The groups were assigned as Experimental Group I, Experimental Group II and Experimental Group III in an equivalent manner. Experimental Group I was exposed to functional training, Experimental Group II was exposed to plyometric training and Experimental Group III was exposed to combined training. The duration of experimental period was 8 weeks. Analysis of Covariance (ANCOVA) was used to find out the significance among the mean differences, whenever the 'F' ratio for adjusted test was found to be significant; scheffe's post hoc test was used. In all cases 0.05 level of significant was fixed to test hypotheses. The combined training had registered significant improvement on selected strength variables namely explosive strength and strength endurance than the other two experimental groups.

**Key words:** Functional Training, Plyometric training, Explosive Strength and Strength Endurance

### **INTRODUCTION**

The first element for any sports performance is the athlete must be strong enough for his or her posture to exert ground reaction forces effectively and

overcome gravitational pull. Without this athletic quality, movements definitely not efficient or effective, and injuries will occur (Bartlett, 2014). A scientifically based and systematic training

programme is fundamental to the athlete's fitness. Training caters the athlete with the necessary means to conform to his specific muscle stressors by organized exercise (Bompa, 2000). New training theory may supplement the coach's practical knowledge to help him formulate a balanced training programme (Mangin, & Dunsmore, 2015).

Functional training is emphasizing multi-planar, and multi-joint activities, combining upper body and lower body movements and utilizing more of the human body muscles in each action (Allen, 2002). Functional Strength Training is the key to enhancing athletic performance for every athlete. By eliminating imbalances and improving neuromuscular strength and coordination, training becomes, and the injury risk goes down (Miller & Herkimer, 2012).

Finally, short band rotations and low to-high cable chops develop the hip power and core stiffness necessary for bat speed, but they do not feature the full batting motion. In essence, functional strength allows an athlete to apply strength to a sport skill. It's the best and most progressive way to improve athletic performance without actually doing a sport-specific drill or exercise (Santana, 2015).

Plyometrics also known as jump training is a training technique designed to increase muscular power and explosiveness (Santos & Janeira, 2008). Originally developed for Olympic athletes, plyometric training has become a popular workout routine for people of all ages, including children and adolescents (Faigenbaum, 2000). Plyometric training conditions the body with dynamic resistance exercises that rapidly stretch a muscle. Hopping and jumping exercises, for example, subject the quadriceps to a stretch-shortening cycle that can strengthen these muscles, increase vertical jump, and reduce the force of impact on the joints (Meszler, 2019).

Volleyball has developed into a highly competitive sport which requires a high level of physical, physiological and psychological fitness. The game at a high level of competition, requires quicker sudden movements and fast reaction. Volleyball matches have no time limit and matches can last for several hours, if the teams are evenly matched (Sanchez-Moreno, et al. 2015).

Successful play in volleyball is not the outcome of power alone but it is the product of the combined display of power and tactical abilities. Modern game of volleyball is characterized by

accuracy, concentration and cleverness (Rao,& Rao, 2016). According to Gene Hooks,"the more popular sports demand strength for success but by their nature do little to develop it." In order to develop the leg strength or arm strength the area must be overloaded.

### METHODOLOGY

To achieve the purpose of the present study, Forty five male volleyball players were randomly selected from Chennai district, Tamil Nadu, were

randomly selected their age ranged between 18 to 25 years. The groups were assigned as Experimental Group I, Experimental Group II and Experimental Group III in an equivalent manner. Experimental Group I was exposed to functional training, Experimental Group II was exposed to plyometric training and Experimental Group III was exposed to combined training. The duration of experimental period was 8 weeks.

### RESULTS

TABLE - I

#### COMPUTATION OF ANALYSIS OF COVARIANCE OF MEAN OF FUNCTIONAL TRAINING, PLYOMETRIC TRAINING AND COMBINED TRAINING GROUP ON EXPLOSIVE STRENGTH

	FTG	PTG	CFTPT	Source of Variance	Sum of Squares	Df	Means Squares	F-ratio
<b>Pre-Test Means</b>	30.31	30.28	31.01	<b>BG</b>	1.19	2	0.59	0.83
				<b>WG</b>	30.22	42	0.72	
<b>Post-Test Means</b>	33.72	33.86	35.82	<b>BG</b>	79.37	2	39.68	<b>122.48*</b>
				<b>WG</b>	13.60	42	0.32	
<b>Adjusted Post-Test Means</b>	33.71	33.84	35.80	<b>BG</b>	78.65	2	39.32	<b>118.65*</b>
				<b>WG</b>	13.58	41	0.33	

An examination of table - I indicated that the pre test means of functional training, plyometric training and combined training group were 30.31, 30.28 and 31.01 respectively. The obtained

F-ratio for the pre-test was 0.83 and the table F-ratio was 3.22. Hence the pre-test mean F-ratio was insignificant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved



that there were no significant differences between the experimental and combined training group indicating that the process of randomization of the groups was perfect while assigning the subjects to groups.

The post-test means of the functional training, plyometric training and combined training group were 33.72, 33.86 and 35.82 respectively. The obtained F-ratio for the post-test was 122.48 and the table F-ratio was 3.22. Hence the post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that the differences between

the post test means of the subjects were significant.

The adjusted post-test means of the functional training, plyometric training and combined training group were 33.71, 33.84 and 35.80 respectively. The obtained F-ratio for the adjusted post-test means was 118.65 and the table F-ratio was 3.23. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 41. This proved that there was a significant difference among the means due to the experimental trainings on explosive strength

**TABLE - II**

**THE SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED POST TEST PAIRED MEANS ON EXPLOSIVE STRENGTH**

Adjusted Post-test means			Mean Difference	Required CI
FTG	PTG	CGFTPTG		
33.71	33.84	---	0.13	0.53
33.71	---	35.80	2.09*	
---	33.84	35.80	1.96*	

\* Significant at 0.05 level of confidence

The multiple comparisons showed in Table II proved that there existed significant differences between the adjusted means of functional training with combined training group (2.09), func-

tional training with combined training group (1.96). There was no significant difference between functional training and plyometric training (0.13) at 0.05 level of confidence with the confidence interval value of 0.53.

FIGURE - 1

**PRE POST AND ADJUSTED POST TEST DIFFERENCES OF THE, FUNCTIONAL TRAINING, PLYOMETRIC TRAINING AND COMBINED TRAINING GROUP ON EXPLOSIVE STRENGTH**

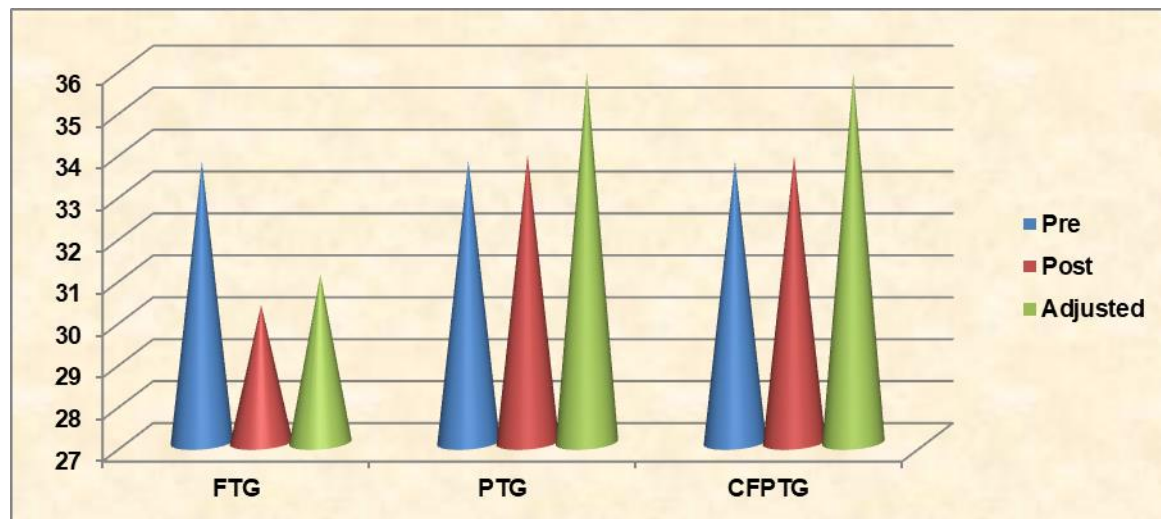


TABLE - II

**COMPUTATION OF ANALYSIS OF COVARIANCE OF MEAN OF FUNCTIONAL TRAINING, PLYOMETRIC TRAINING AND COMBINED TRAINING GROUP ON STRENGTH ENDURANCE**

	FTG	PTG	CFTPT	Source of Variance	Sum of Squares	df	Means Squares	F-ratio
<b>Pre-Test Means</b>	25.54	25.33	25.77	<b>BG</b>	0.006	2	0.003	0.20
				<b>WG</b>	0.58	42	0.01	
<b>Post-Test Means</b>	29.33	28.76	31.22	<b>BG</b>	0.70	2	0.35	<b>37.03*</b>
				<b>WG</b>	0.39	42	0.009	
<b>Adjusted Post-Test Means</b>	29.33	28.75	31.21	<b>BG</b>	0.69	2	0.34	<b>35.74*</b>
				<b>WG</b>	0.39	42	0.01	

An examination of table - III indicated that the pre test means of functional training, plyometric training and combined training group were 25.54, 25.33 and 25.77 respectively. The obtained F-ratio for the pre-test was 0.20 and the table F-ratio was 3.22. Hence the

pre-test mean F-ratio was insignificant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that there was no significant difference between the experimental and combined training group indicating that the process of randomization of the groups

was perfect while assigning the subjects to groups.

The post-test means of the functional training, plyometric training and combined training group were 29.33, 28.76 and 31.22 respectively. The obtained F-ratio for the post-test was 37.03 and the table F-ratio was 3.22. Hence the post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 42. This proved that the differences between the post test means of the subjects were significant.

The adjusted post-test means of the functional training, plyometric training and combined training group were 29.33, 28.75 and 31.21 respectively. The obtained F-ratio for the adjusted post-test means was 35.74 and the table F-ratio was 3.23. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 2 and 41. This proved that there was a significant difference among the means due to the experimental trainings on strength endurance.

**TABLE - IV**

**THE SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED POST TEST PAIRED MEANS ON STRENGTH ENDURANCE**

Adjusted Post-test means			Mean Difference	Required CI
FTG	PTG	CGFTPTG		
29.33	28.75		0.58	0.79
29.33		31.21	1.88*	
	28.75	31.21	2.46*	

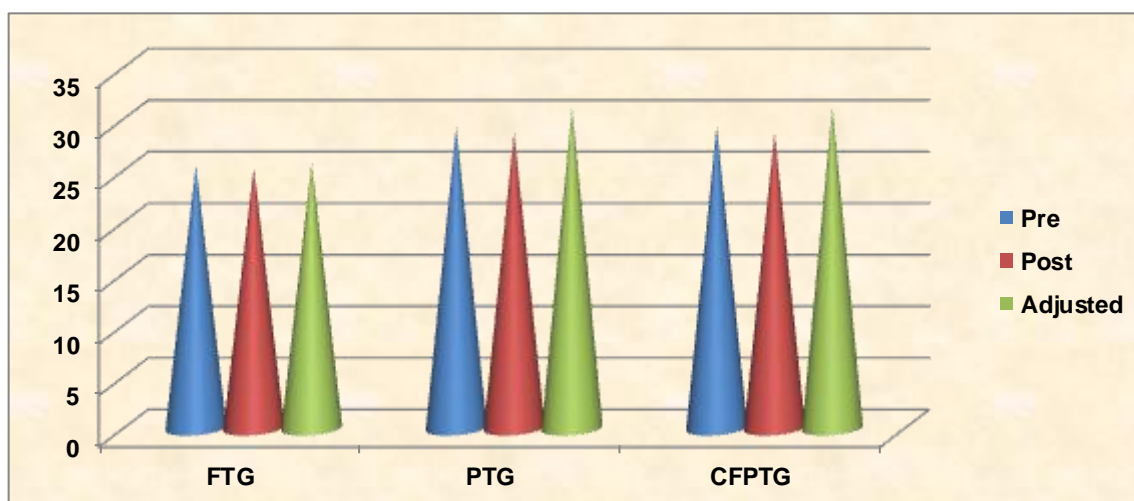
\* Significant at 0.05 level of confidence

The multiple comparisons showed in Table IV proved that there existed significant differences between the adjusted means of vision training with combined training group (1.88), game

specific training with combined training group (2.46). There was no significant difference between game specific training and vision training (0.58) at 0.05 level of confidence with the confidence interval value of 0.79.

**FIGURE - 2**

**PRE POST AND ADJUSTED POST TEST DIFFERENCES OF THE, FUNCTIONAL TRAINING, PLYOMETRIC TRAINING AND COMBINED TRAINING GROUP ON STRENGTH ENDURANCE**



## DISCUSSION ON FINDINGS

The outcomes of the study reflected a significant improvement difference at  $p < 0.05$ . However within the group comparison revealed the significant changes from pre-test to post-test in the study variable. In post hoc results showed all the experimental groups had significantly increase selected strength variables. Within the group comparison proved that no significant mean changes in selected strength variables between the functional training and plyometric training groups and combined training groups were better than the experiential groups and control group at 0.05 level of significant. The conclusions of the analysis have found similar of the other research findings parasuraman (2022) revealed that reserved volume changes due to different intensity of circuit training. Ramirez-Campillo (2013) found significant changes on explosive strength due to plyometric training. Hung (2021) balance and shooting performance increases due to complex strength training. Keiner (2022) conclude speed, functional, and traditional strength training significantly improves

on strength, linear sprint, change of direction, and jump performance in trained adolescent soccer players. Guler (2021) found that functional movement and balance improves due to functional strength training. Wibowo (2021) found short term high intensity functional strength training significantly improves strength and endurance in recreational runners.

## CONCLUSION

From the analysis of the data, the following conclusions were drawn:

1. The functional training had registered significant improvement on selected strength variables namely explosive strength and strength endurance after undergoing functional training for a period of twelve weeks.
2. The plyometric training had registered significant improvement on selected strength variables namely explosive strength and strength endurance after undergoing plyometric training for a period of twelve weeks.
3. The combined training had registered significant improvement

on selected strength variables namely explosive strength and strength endurance after undergoing combined training for a period of twelve weeks.

4. The combined training had registered significant improvement on selected strength variables namely explosive strength and strength endurance than the other two experimental groups.

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### Funding

This study was not funded by any grant

### Acknowledgements

The authors would like to thank every participant for his effort and time.

### Conflict of interest

None of the authors have any conflicts of interest to declare.

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### How to cite this Article

**Dr.R.Radhakrishnan** Effect of functional training and plyometric training on selected strength variables among volleyball players. *Bharathiar National Journal of Physical Education and Exercise Sciences* 13(3) (2022) 39-47





## **Effect of Yogic Practices on Anxiety among Low Back Ache Men**

**Dr. I. Karikalan**

Physical Education Teacher, Municipal High School, Kovilpatti.

### **Abstract**

The purpose of the study was to find out effect of yogic practices on anxiety among Low Back Ache Men. To achieve the purpose of the study, 30 subjects were selected randomly from Kovilpatti in the age group of 30 – 60 years there are divided into two groups. Each group consists of 15 subjects. Group I underwent yogic practice and group II acted as control group. The pre-test scores were taken to the two groups before giving yogic practices. After the experimental period of six weeks, post test scores were obtained from all two groups. The difference between initial and final scores on psychological variables considered as the effect of varied packages of yogic technique on subjects. The mean differences were tested for significance using analysis of T- Test. The result of the study it was hypothesized that the Yogic practices had significantly decreased anxiety level when compared to control group.

**Key words:** Yogic Practices, Anxiety, Low Back, Ache.

### **INTRODUCTION**

The term Hatha Yoga has been commonly used to describe the practice of asana (postures). The syllable 'ha' denotes the pranic (vital) force governing the physical body and 'tha' denotes the chitta (mental) force thus making Hatha Yoga a catalyst to an awakening of the two energies that govern our lives. More correctly the techniques described in Hatha Yoga harmonise and purify the body systems and focus the

mind in preparation for more advanced chakra and kundalini practices.

The life style of men changed due to technological modernization and advancement of science. Increased standard of living has brought a great comfort to mankind but they are worried about health. Everyone is sick having either physical or mental problem. Yogasanas are one of the important parts of yogic exercises which contribute to physical as well as men-



tal health. Yoga is a mind body practice that combines stretching exercises, controlled breathing and relaxation. It is considered a mind body type of complementary and alternative medicine practice. The health benefits of Yoga with a regular practice of Yoga poses, breathing exercise and meditation is grouped into three kinds: physiological, psychological and biochemical effects. Yogasanas have an equal balancing effect on all organs simultaneously without making an effort to think about different parts and internal organs of the body.

## METHODS AND MATERIALS

The purpose of the study was to find out effect of yogic practices on anxiety among Low Back Ache Men, 30 subjects are to be selected in random from Tirunelveli. Their age ranged from 30

to 60 years. All the subjects were assigned to one experimental group (EXPG 1) and one control group (CG II) each consisting of 15 subjects. The treatment will be given for 6 weeks. Initial test and final test will be taken on all the groups.

The program of yogic technique was given to experimental Group A control group (B) was not given any kind of yogic practices. The pre-test scores were taken to the two groups before giving yogic practices. After the experimental period of six weeks, post test scores were obtained from all two groups. The difference between initial and final scores on psychological variables considered as the effect of varied packages of yogic technique on subjects. The mean differences were tested for significance using analysis of T- Test.

## RESULTS

### TRAINING SCHEDULE

TABLE – I

#### YOGIC TRAINING FOR SIX WEEKS

S.No	Yogic Training	Frequency	Duration	Rounds	Rest	Total Duration
1	loosening exercises	1	2	3	3 to 6 sec	10 minutes
2	Pavanamuktasana (Wind releasing pose) series	3	20 sec	2	3 to 6 sec	2 minutes

3	Ardha Navasana (half boat pose)	3	20 sec	2	3 to 6 sec	2 minutes
4	Uttanapadasana (straight leg raise pose)	3	20 sec	2	3 to 6 sec	2 minutes
5	Sethubandhasana breathing (bridge pose lumbar stretch)	3	20 sec	2	3 to 6 sec	2 minutes
6	Supta Udarakarshanasana (folded leg lumbar stretch)	3	20 sec	2	3 to 6 sec	2 minutes
7	Shavaudarakarshanasana (crossed leg lumbar stretch)	3	20 sec	2	3 to 6 sec	2 minutes
8	Bhujangasana (serpent pose)	3	20 sec	2	3 to 6 sec	2 minutes
9	Shalabhasana breathing (locust pose)	3	20 sec	2	3 to 6 sec	2 minutes
10	Marjari-asana (cat stretch pose)	3	20 sec	2	3 to 6 sec	2 minutes
11	Shashankasana breathing (moon pose)	3	20 sec	2	3 to 6 sec	2 minutes
12	Ardha Chakrasana (half wheel pose)	3	20 sec	2	3 to 6 sec	2 minutes
13	Prasarita Pada Hastasana (forward bend with	3	20 sec	2	3 to 6 sec	2 minutes
14	Ardha kati Chakrasana (lateral arc pose)	3	20 sec	2	3 to 6 sec	2 minutes
15	<b>Nadi Shoddana (Alternate Nostril Breathing)</b>	4	15 to 20 sec	4	3 to 6 sec	6 minutes
16	Pain management Meditation	1	5 min	1	-	5 minutes
17	Quick relaxation technique in Shavasana (corpse pose)	1	10 min	1	-	10 minutes

## RESULTS

The stress was measured through stress questionnaire. The Table- I shows the 't' of anxiety on yoga practices (Group I) and Control group (group II) of Low Back Ache Men.

**TABLE I****COMPUTATION OF ANALYSIS OF 't' TEST – ANXIETY**

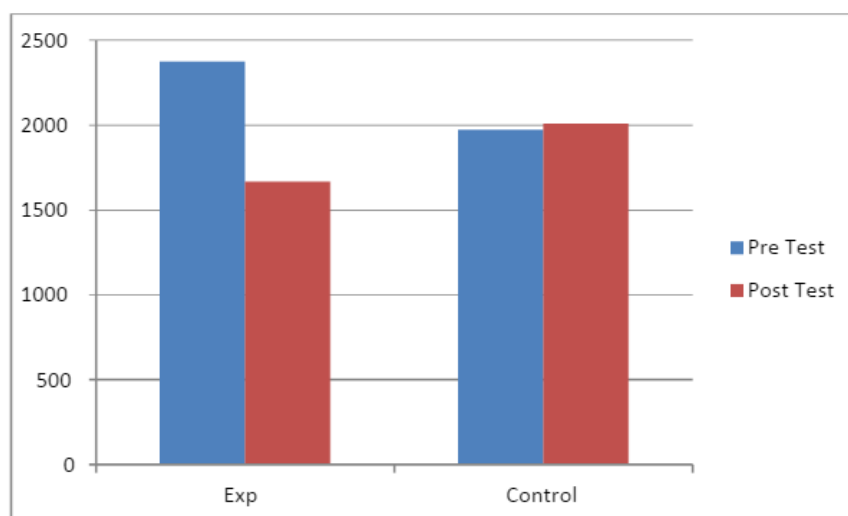
Group		Pre Experiment	Post Experiment	T Values
<b>Experimental</b>	Mean	45.3	31.0	3.1154
	SD	14.8	9.9	
	N	15	15	
<b>Control</b>	Mean	44.8	45.2	0.0811
	SD	13.9	13.1	
	N	15	15	

't' ratio at 0.05 level of confidence for the degree of freedom (df) at 14 = 2.14

The obtained 't' value 3.11 of the experimental group with respect to the anxiety was significantly higher than the required 't' value ( 2.14) and it is proven that there is a significant difference in the anxiety of the experimental group.

**FIGURE-I**

**EFFECT OF YOGIC PRACTICE ON ANXIETY OF THE PRE TEST AND POST TEST OF THE CONTROL GROUP AND EXPERIMENTAL GROUP**



Findings of the study imply that there was a significant improvement in the anxiety levels which may be the effect of yoga practices given to the experimental group.

## DISCUSSION ON HYPOTHESIS

For the purpose of this study it was hypothesized that the Yogic practices had significantly decreased anxiety level when compared to control group.

The results presented in Tables I and table II proved that there was a significant difference due to six weeks Yogic practices on anxiety. Thus, the hypothesis was accepted at 0.05 level.

## CONCLUSION

Within the limitations of the study the following conclusion was drawn.

1. The yoga group showed significance improvements in the decrease in anxiety level compared with the control group.

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### **How to cite this Article**

**Dr.I.Karikalan** Effect of yogic practices on anxiety among low back ache men. Bharathiar National Journal of Physical Education and Exercise Sciences 13(3) (2022) 48-53

### **Funding**

This study was not funded by any grant

### **Acknowledgements**

The authors would like to thank every participant for his effort and time.

### **Conflict of interest**

None of the authors have any conflicts of interest to declare.

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## **Comparative Study on Team Cohesion among Volleyball Players**

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### **Abstract**

The aim of this study was to find out the comparative study on team cohesion among volleyball players participated in inter-collegiate volleyball tournament conducted for affiliated Colleges under University of Madras, Chennai. The study was controlled on 10 attackers, 10 setters, 10 universals and 10 blockers in the age group of 18 to 25 and completed the group environment questionnaire (Carron, A.V et., al. 1985). The obtained 'F'ratio value on the scores of ATGS 0.36 was lesser than the required table value of 2.87, which proved that there was no significant difference on ATGS among volleyball players. The obtained 'F' ratio value on the scores of ATGT 0.22 was lesser than the required table value of 2.87, which proved that there was no significant difference on ATGT among volleyball players. The obtained 'F'ratio value on the scores of GIS 3.74 was greater than the required table value of 2.87, which proved that there was significant difference on GIS among volleyball players. The obtained 'F' ratio value on the scores of GIT 1.35 was lesser than the required table value of 2.87, which proved that there was no significant difference on GIT among volleyball players. The overall team cohesion were the blockers have more dominating then the attackers, setters and universal.

**Key words:** Team Cohesion, ATGS - Individual attractions to the Group-Social, ATGT- Individual attractions to the Group-Task, GIS- Group Integration Social and GIT- Group Integration Task.

### **INTRODUCTION**

Volleyball is played among two teams of six players and each position serves a unique role in the success of the team. The performance in volleyball is closely associated with high

level of technical ability and tactical appearance at times of unbreakable. The execution of the skills in volleyball like service execution, serve reception, set execution, attack execution and defence reception are being per-

formed individually by a player first. The next action is being done by another player like set quite supportively and only then the last and final touch being made by an attacker, who approaches and jumps timely, calculating the height, speed and flight of the ball, tries to apply the tactical execution in making the ball to land on the opponent's court unpredictable by the defenders. Hence to reach success in each move of action and counter action, the team players on the court must function individually first and then as a group. Here the role of cohesion can be very well seen. Individual attractions to Group-Task have been given emphasis first, then to the Group Integration - Task. Hence the performance in volleyball is closely related with team cohesion.

Psychological preparation is an integral part of the training system. Sports psychology may play a part in the preparation of events. Sports psychology involves the study of psychological factors that affect performance. Psychology enters volleyball through two kinds of purpose. The first is a partial purpose analysing different psychic processes, states, and personalities of athletes. The second one is a general purpose concerning the whole field of

training and competition. It is interesting to note the contrasting approaches among players when things are gone wrong when they are extremely skilled and expected to win.

Individual behaviour and actions are closely bound to the whole group. In addition, the victories and defeats of the group, its' rise and fall, deeply affect the individual member. Different attitudes towards winning or losing may produce different moods with different accompanying side effects. A proper attitude towards victory or defeat is one of the factors that can help to stabilize the mood. Here, the most important question is whether performance is the cause or the consequence of the cohesion in the group. Cohesion and fraternity within the group is a situation in which the group members work together, involving and supporting each other in the execution of a task. Cohesion, as the mutual force of attraction is therefore considered the glue or cement in the group.

Sports psychology perhaps explains why some team may fail when they are expected to win. Sport psychology is the science, study and practise. An elite player recognizes the study and practice of mental preparation, techniques and strategy for peak

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performance which help them to come from devastating defeats. The strength of the team is each individual member. The strength of each member is the team. The most important things are the goals that they set. Their goals that they set will determine how much they drive.

**Carron, A.V et., al. (1985)** developed the Group Environment Questionnaire (GEQ), which is based on a conceptual model in which cohesion is considered to be a result of four primary constructs: Individual Attractions to the Group-Task, which reflects a member's feelings about his or her personal involvement with the group's task; Individual Attractions to the Group-Social, a member's feelings about his or her personal social interactions with the group; Group Integration-Task, a member's perceptions of the similarity and unification of the group as a whole around its tasks and objectives and Group Integration-Social, a member's perception of the similarity and unification of the group as a social unit. Cohesion has traditionally been considered as one of the most significant variable.

## **METHODOLOGY**

### **SELECTION OF THE SUBJECTS:**

The purpose of the study was to find out the comparative study on team cohesion among volleyball players. To achieve the purpose of the study 10 attackers, 10 setters, 10 universals and 10 blockers (age 18 to 25) were selected from the inter collegiate volleyball tournament conducted for affiliated colleges under University of Madras. The players completed the questionnaire voluntarily.

### **QUESTIONNAIRE:**

The Group Environment Questionnaire (**Carron et., al. 1985**) was used to assess team cohesion. This is a self-report questionnaire that contains 18 items. Four aspects of cohesion are assessed: Individual Attractions to the Group-Task (4 items), Individual Attractions to the Group-Social (5 items), Group Integration-Task (5 items) and Group Integration-Social (4 items). Responses are provided on a 9-point Likert scale affixed at the extremes by 'strongly disagree' (1) to 'strongly agree' (9). Thus, higher scores reflect stronger perceptions of cohesiveness.

### **STATISTICAL ANALYSIS**

The data analysed and compared with the help of statistical procedure in which arithmetic mean, standard deviation and 'F'- test used to compare the data.

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**RESULTS**

The value of calculated t-test was compared with the tabulated significant value at 0.05 level of confidence with 95 degree of freedom. The details for comparative mean value and SD values on team cohesion were tabulated and presented below:

**Table I**  
**Mean, SD, SE on Team Cohesion among Volleyball Players**

S.No.	GEQ	Group	N	Mean	Std. Deviation	Std. Error Mean
1	ATGS	Attacker	10	33.20	6.83	2.16
		Setters	10	33.70	5.54	1.75
		Universals	10	31.00	6.09	1.93
		Blocker	10	33.70	8.34	2.64
2	ATGT	Attackers	10	28.20	3.65	1.15
		Setters	10	28.10	4.20	1.33
		Universals	10	29.50	5.54	1.75
		Blockers	10	28.40	3.92	1.24
3	GIS	Attackers	10	20.00	3.59	1.14
		Setters	10	19.00	2.45	0.77
		Universals	10	22.20	2.57	0.81
		Blockers	10	22.40	2.07	0.65
4	GIT	Attackers	10	33.50	5.30	1.67
		Setters	10	30.30	2.11	0.67
		Universals	10	32.30	4.50	1.42
		Blockers	10	31.10	2.33	0.74

Table I reveals that the mean values of individual attractions to the group-social (ATGS) of the attackers were 33.20, setters were 33.70, uni-

versals were 31.00 and blockers were 33.70. The mean values of individual attractions to the group-task (ATGT) of the attackers were 28.20, setters were 28.10, universals were 29.50 and blockers were 28.40. The mean values of group-integration social (GIS) of the

attackers were 20.00, setters were 19.00, universals were 22.20 and blockers were 22.40. The mean values of group-integration task (GIT) of the attackers were 33.50, setters were 30.30, universals were 32.30 and blockers were 31.10.

**Table II**  
**Computations of Analysis of Variance on Team Cohesion among Volleyball Players**

Team CohesionGEQ	Sources of Variance	Sum of Squares	df	Mean Square	F
ATGS	Between	49.80	3	16.60	0.36
	Within	1655.80	36	45.99	
ATGT	Between	12.50	3	4.17	0.22
	Within	693.40	36	19.26	
GIS	Between	83.60	3	27.87	3.74*
	Within	268.00	36	7.44	
GIT	Between	58.80	3	19.60	1.35
	Within	523.60	36	14.54	

\* Significant at 3, 36 df at 0.05 level 2.87

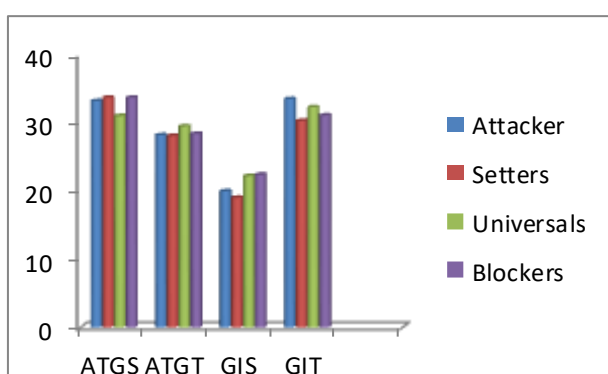
As shown in Table II, the obtained F ratio value on the scores of Individual attractions to the Group-Social 0.36 was lesser than the required table value of 2.87, which proved that there was no significant difference on Individual attractions to

the Group-Social between volleyball players. The obtained F ratio value on the scores of Individual attractions to the Group-Task 0.22 was lesser than the required table value of 2.87, which proved that there was no significant difference on Individual attractions to

the Group-Task between volleyball players. The obtained F ratio value on the scores of the Group Integration - Social 3.74 was greater than the required table value of 2.87, which proved that there was a significant difference on Group Integration -Social

between volleyball players. The obtained F ratio value on the scores of the Group Integration -Task 1.35 was lesser than the required table value of 2.87, which proved that there was no significant difference on Group Integration -Task between volleyball players.

**Fig 1. Showing the mean values of Team Cohesion between Volleyball Players**



**Fig 2. Showing the Analysis of Variance on Team Cohesion between Volleyball Players**



**Table III**

**Scheffe's post hoc test analysis on Group Integration – Social (score)between Volleyball Players**

Mean Difference of					Reqd C.I.
Groups	Attackers	Setters	Spin Bow- lers	Blockers	
Attackers	-	1.00	-	2.40*	1.96
Setters	-	-	3.20*	-	
Universals	2.20*	-	-	0.20	
Blockers	-	3.40*	-	-	

Table III shows that the mean differences between attackers and blockers were 2.40, setters and universals were 3.20, universals and attackers were 2.20, blockers and setters were 3.40 which was greater than the required Scheffe's confidence interval value of 1.96. Hence, the difference between the groups was significant.

cant at 0.05 level of confidence. Hence the null hypothesis was rejected at 0.05 level of confidence.

The mean differences between attackers and setters were 1.00, universal and blockers were 0.20 which was lesser than required Scheffe's confidence interval value of 1.96. Hence, there was no evidence to reject the null hypothesis.

### **DISCUSSION ON FINDINGS**

The attribute may negatively affect social cohesion needed for successful performance in a team. Players in more cohesive teams may hold stronger shared beliefs in their competence, which in turn may lead to greater team success. Earlier research has been conducted in order to spot and investigate personal attributes which are associated with performance in sports. Attributes such as self-esteem, pride and competition within a team and attitudes towards other players in a team have both negative and positive effects. The domination elements of the game in performance are Attack, Block and Serve Placement. In the case of team cohesion blockers and universals have more individual attractions to the Group-Social (ATGS) than the attackers and setters.

Universals have more Individual attractions to the Group-Task (ATGT) than the attackers, setters and blockers.

Blockers have more Group Integration -Social (GIS) than the attackers, setters and universal.

Attackers have more Group Integration -Task (GIT) than the setters, universal and blockers.

But the Table I shows that the blockers have more team cohesion than the attackers, setters and universal.

The result of the study is also in accordance with the findings of **Olivia Nolanet., al. (2000)** found within the sub-scales of social and positive reinforcement on the relationship between team cohesion and the level of volleyball played.

### **CONCLUSIONS**

The findings reveal that the team cohesion of ATGS, ATGT and GIT has shown no significant difference between volleyball players. GIS has shown the significant difference between volleyball players.

1. There was no significant difference on Individual attractions to the Group-Social between volleyball players.

2. There was no significant difference on Individual attractions to the Group-Task between volleyball players
3. There was a significant difference on Group Integration-Social between volleyball players.
4. There was no significant difference on Group Integration-Task between volleyball players.

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### Funding

This study was not funded by any grant

### Acknowledgements

The authors would like to thank every participant for his effort and time.

### Conflict of interest

None of the authors have any conflicts of interest to declare.

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### How to cite this Article

**Dr.S.V.Arun** Comparative Study on Team Cohesion among Volleyball Players. Bharathiar National Journal of Physical Education and Exercise Sciences 13(3) (2022) 54-62



## **Impact of Various Physical Training on Physical Fitness Variables among School Level Kho-Kho Players**

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### **Abstract**

Training is a systematic process of repetitive progressive exercise of work involving learning and acclimatization. Training is the net summation of adaptations induced by regular exercise. Students on the exercises with reference to fitness state that it enables to tolerate more effectively, subsequently stresses of similar nature. The study was designed to impact of various physical training on physical fitness variables among school level khokho players. To achieve the purpose of the study 30 school khokho players were selected from St.John's Matriculation Higher Secondary School, Madurai and seventhday matriculation and higher secondary school, Madurai. Their age ranged between 15 and 17 years and they were divided into two equal groups consists of 20 each. Group I underwent various physical training and Group II acted as control group. Physical fitness variables namely speed was measured 50 meters dash and agility was measured by 4x10 shuttle run test. The training was given to the experimental group for 3 days per week for the period of 12 weeks. The control group was not given any sort of training except their routine work. The data were collected from the subjects was statistically analyzed with paired 't' test to find out significant improvement if any at 0.05 level of confidence. The results of this study indicated that the speed and agility of school level khokho players improved significantly due to the impact of various physical training.

**Key words:** Various Physical training, speed, Agility and khokho players.

### **INTRODUCTION**

The word 'training' means different things in different fields. In

sports, the word training is generally understand to be a synonyms doing physical exercises. In a narrow sense, training is doing physical exercise for



the improvement of performance. This concept is reflected in words for terms which are gives to a separate component of training or separate methods of procedures of doing physical exercises, sports, medicine and exercise physiologists also understand training to be doing physical exercise for improvement of performance or of separate performance factors (Hardhayal Singh, 1984).

In general physical training imposes stress on the body tissues, in particular, the muscles. Chronic muscular activity which occurs during training can be considered a positive form of stress because it stimulates growth and improves muscular performance. The most of the changes that occur in the muscle as a result of training are gradual and occur over several weeks or months. The magnitude of these muscular adaptations are somewhat proportional to the amount of exercise performed during training. There is now a much broader base of knowledge regarding these special human beings and athletes and this is directly reflected in the methodology of training. New methods are surfacing which are often found to be useful in daily training (Wilmore and Costil, 1988).

## **SPORTS TRAINING**

Sports training is a basic preparation of the sportsmen for better performance through physical exercise. It is based on scientific principles of aiming at education and performance, enhancement. Sports activities consists of motor movement and action and their success depends to a great extend on how correctly they are performed. Techniques of training and improvement of tactical efficiencies plays a vital role in training process (Fox, 1984).

The term "Training" is widely used in sports. But there is some disagreement among coaches and sports scientists regarding the meaning of this word. Some experts understand that sports training is basically doing physical exercises, the factors essentials are sports equipment and implements verbal instructions, means of recovery, means of assessment of performance capacity, nutrition, psychological means etc. Further advanced training of sports persons significantly supported by several sports performance in addition to physical and physiological characteristics, the social and psychic capacities of the sports persons also have to improve. Today sports trainings are mostly based upon

the competitive motive each nation is trying to achieve top level performance and to win laurels in international competitions. Today's records are proved to be lower performance of tomorrow. This is because greater stress has been laid on the quality rather than quantity training (Watron, 1983).

Sports training aims at improving the performance of sports persons. The sports performance depends on several factors like constitution, condition, technique, tactics, coordination and personality. Sports training is done for improving sports performance. The sports performance as any other type of human performance, is not the product of one single system (or) aspect of human personality. On the contrary it is the product of the total personality of the sports person. The personality of person has several dimensions. For example physical, physiological, social and psychic dimensions. In order to improve sports performance the social and psychic capacities of the sports person also have to be improved in addition to the physical and physiological ones. In other words the total personality of sportsman has to be improved in order to improve his performance. Sports training, therefore, directly and indirectly aims at im-

proving the personality of the sports man. High sports performance through sports training can be achieved by a scientific and systematic use of training means. Training means are various physical exercises and other objects, methods and procedure which are used for the improvement maintenance and recovery of performance capacity and performance readiness (Hardhayal Singh, 1991).

### **SPEED**

Speed is the rapidity of movement top speed is important for a player such as a midfielder who must cover long distances. To develop speed, one must increase stride length, stride frequency, and hand/arm action. Exercises that may assist in speed development are listed below. High knees increase hip flexor strength and flexibility by running with knees rising to waist, with appropriate arm action (hand movement should be hip to shoulders). Increases hamstring strength and flexibility by running with trailing leg kicking back to touch the buttocks, again using appropriate arm action. Resisted running increases stride length and may be accomplished by uphill running outdoors or on an incline treadmill and through the use of a partner or an elastic band.

Short high-speed sprints increases stride frequency and may be accomplished by towing with a sprint cord, treadmill sprints, and downhill running (Baechle 1994).

### **AGILITY**

Agility is the ability to maintain and control correct body position while quickly changing direction through a series of movement's .This may be required of forwards in order to maneuver around defensive players near the goal. Likewise, defensive players may benefit from these drills for the opposite reason. Exercises that improve agility, balance, and coordination. Agility ladder the ladder can be positioned straight or at various angles for quick change of direction with fast foot movements. Step hurdles. These drills help to develop a quick knee lift and step. They can be used for forward or lateral movements, again with fast foot movements (Roozen 2004).

### **METHODOLOGY**

The study was designed to impact of various physical training on physical fitness variables among school level khokho players. To achieve the purpose of the study 40

school khokho players were selected from St.John's Matriculation Higher Secondary School, Madurai and seventh day matriculation and higher secondary school, Madurai. Their age ranged between 15 and 17 years and they were divided into two equal groups consists of 20 each. Group I underwent various physical training and Group II acted as control group. Physical fitness variables namely speed was measured 50 meters dash and agility was measured by 4x10 shuttle run test. The training was given to the experimental group for 3 days per week for the period of 12 weeks. The control group was not given any sort of training except their routine work. During the training period the experimental group underwent the training of various physical training for twelve weeks of period in addition to their daily routine activities as per the curriculum. Experimental group underwent training program on three days per week for twelve weeks period. All the subjects involved in this study were carefully monitored throughout the training program, none of the reported with tear and muscle soreness. The data collected from the subjects was statistically analyzed with paired 't' test to find out significant im-

provement if any at 0.05 level of confidence.

## RESULTS

**TABLE - I**  
**ANALYSIS OF 'T' RATIO FOR THE PRE AND POST TEST OF EXPERIMENTAL AND CONTROL GROUP ON SPEED**

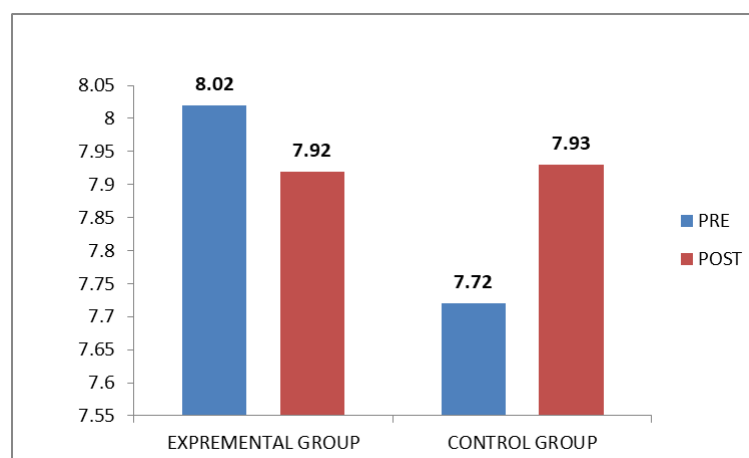
Variables	Group	Test	Mean	SD	MD	SEM	t-ratio
SPEED	Experimental Group	Pre test	8.02	0.25	0.30	0.33	8.87*
		Post test	7.72	0.26			
	Control Group	Pre test	7.92	0.34	0.01	0.02	2.04
		Post test	7.93	0.35			

(Significance at 0.05 level of confidence for df of 14 is 2.14)

Table I shows that the pre test mean values of experimental group and control group 8.02 and 7.92 respectively and the post test mean values are 7.72 and 7.93 respectively. The obtained dependent t-test between the pre and post test means on speed of experimental group and control group are 8.87 and 2.04 respectively. The table value required

for significant difference with degrees of freedom 14 at 0.05 level of confidence is 2.14. The obtained 't' test value of experimental group was greater than the table value. The results clearly indicated that the speed of the experimental group improved due to the various physical training on school level khokho players.

**FIGURE -I**  
**THE MEAN VALUES OF PRE AND POST TEST ON EXPERIMENTAL AND CONTROL GROUP ON SPEED**



**TABLE - II**  
**ANALYSIS OF 'T' RATIO FOR THE PRE AND POST TEST OF EXPERIMENTAL**  
**AND CONTROL GROUP ON AGILITY**

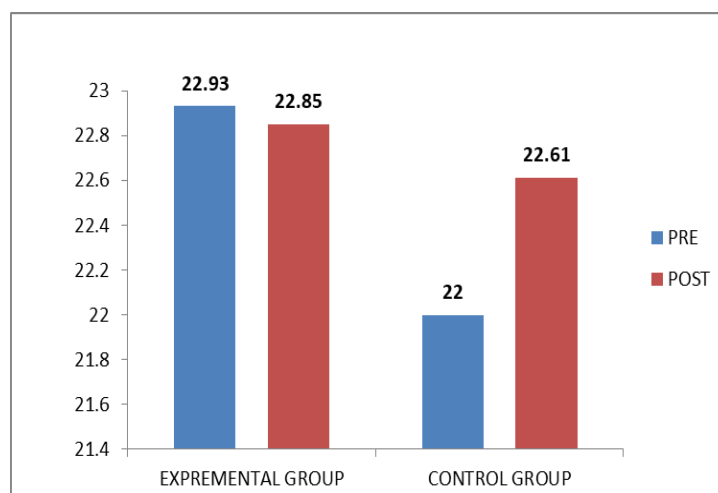
Variables	Group	Test	Mean	SD	MD	SEM	t-ratio
<b>AGILITY</b>	Experimental Group	Pre test	22.93	0.57	0.92	0.12	7.54*
		Post test	22.00	0.34			
	Control Group	Pre test	22.85	0.57	0.24	0.15	1.51
		Post test	22.61	0.16			

(Significance at 0.05 level of confidence for df of 14 is 2.14)

Table II shows that the pre test mean values of experimental group and control group 22.93 and 22.85 respectively and the post test mean values are 22.00 and 22.61 respectively. The obtained dependent t-test between the pre and post test means on speed of experimental group and control group are 7.54 and 1.51 respectively. The table value required

for significant difference with degrees of freedom 14 at 0.05 level of confidence is 2.14. The obtained 't' test value of experimental group was greater than the table value. The results clearly indicated that the agility of the experimental group improved due to the various physical training on school level khokho players.

**FIGURE -II**  
**THE MEAN VALUES OF PRE AND POST TEST ON EXPERIMENTAL AND CONTROL GROUP ON AGILITY**



## DISCUSSIONS ON FINDINGS

The result of the study indicates that the various physical training group produced significant improvement on speed and agility due to the impact of various physical training when compared to the control group. Supported the mean, this examination bolsters the findings of Kumar et al., 2022, Mahulkar et al., 2021, Ravi et al., 2021, Biju et al., 2019, Joseph et al., 2019, Azmi et al., 2018, Chandekar 2018 and Alexandrina et al., 2010 when compared to the control group.

## CONCLUSIONS

1. The study was concluded that experimental group had registered significant improvement on speed and agility due to the impact of various physical training.
2. The study was concluded that various physical training group had registered significant improvement on speed and agility when compared to the control group.

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### Funding

This study was not funded by any grant

### Acknowledgements

The authors would like to thank every participant for his effort and time.

### Conflict of interest

None of the authors have any conflicts of interest to declare.

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**How to cite this Article**

**Mr.A.Thangamurugan** Impact of various physical training on physical fitness variables among school level kho-kho players. Bharathiar National Journal of Physical Education and Exercise Sciences 13(3) (2022) 63-71





## Effect of Kettlebell Training on Selected Physical Variables among Sports Hostel Women

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### Abstract

**Background:** The purpose of the study was to find out the effect of Kettlebell Training on selected strength variables among sports hostel women. **Methods:** Data were analyzed from forty sports hostel women who were selected from Dharmapuri District, Tamil Nadu. The age of the selected subjects was between 14 to 17 years. Further, they were classified randomly into two equal groups of 20 (n=20) subjects each. Group - I Kettlebell Training Group (KTG) underwent Kettlebell training (KT) thrice a week for twelve weeks, and each session lasted for 45 minutes and Group – II - which was a Waiting group (WG) did not undergo any special training apart from the regular activities. The cardio respiratory endurance and explosive strength was measured and tested for the group members before and after the training session. The Analysis of Co-variance (ANCOVA) which has a set value of  $p < 0.05$  was performed to find out the significant mean differences. **Results:** The study revealed that the selected criterion variables of cardio respiratory endurance and explosive strength significantly improved due to the twelve weeks duration of Kettlebell Training among sports hostel women. **Conclusion:** It was concluded that Kettlebell exercises are practical for building the cardio respiratory endurance and explosive strength variables among sports hostel women.

**Keywords:** Kettlebell Training (KT), Cardio Respiratory Endurance, and Explosive Strength.

### INTRODUCTION

In the 'last decade, there has been a significant increase in the

popularity of kettlebells and kettlebell sport, a previously little-known fitness tool and ethnic sport originating in

Russia. Athletes, coaches, personal trainers, fitness enthusiasts, and busy professionals looking to accomplish a lot of exercise in a short amount of time have all gravitated toward this remarkable all-in-one fitness 'method that seamlessly combines strength training, cardiorespiratory conditioning, core stabilization, coordination, and dynamic 'mobility into one intense workout (Cotter, 2022).

Prior to 2001 the kettlebell was an unknown piece of equipment, restricted to only the former Soviet states, specifically to the Soviet military. With the publication of the book Russian Kettle- bell Challenge in 2001, kettlebell training began in the United States and has since become a key functional fitness tool among fitness professionals. Since 2008 The International Kettlebell and Fitness Federation (IKFF) began teaching kettlebell courses in more than 60 countries, and today kettlebells have a presence on all seven continents—even some scientists in Antarctica train with kettlebells (Cotter, 2022).

In the last half-decade Kettlebells are an ideal tool for ballistic, full-body exercises using high muscle forces, making them potentially useful for improving muscular strength and

cardio respiratory fitness (Jay et al., 2013). Kettlebell lifting continues to gain popularity as strength and conditioning training tool and as a sport in and of itself. Although the swing to chest-level and several multi-movement protocols have been analyzed, little research has attempted to quantify the aerobic stimulus of individual kettlebell movements, which would best inform kettlebell-related exercise prescription.

One of the most common reasons people are picking up a kettlebell is to help build muscle strength. Many have credited kettlebell training programs for sculpting and defining their muscles. For example, Tracy Reifkind, a certified kettlebell instructor, has attributed her initial and subsequent muscle definition to kettlebell swings (Reifkind, 2018). Studies show that just a few variations in kettlebell usage simultaneously activates multiple muscles while placing different demands on each muscle (Maulit et al., 2017).

For instance, one-arm and two-arm kettlebell swings mainly activate the erector spinae, a group of muscles necessary for proper posture and mobility. Additionally, one-arm snatches target the external obliques, and one-arm kettlebell cleans will leave outer

thighs “burning”. Kettlebell exercises are also effective in building muscle with those suffering from sarcopenia which is the decline of muscle tissue with age. Elderly women with sarcopenia who engaged in kettlebell training programs exhibited significant increases in skeletal muscle mass compared to those who did not engage in the training (Chen et al., 2018).

## METHODOLOGY

To achieve the purpose forty sports hostel women were selected randomly from Dharmapuri District, Tamil Nadu. The age of the selected subjects was between 14 to 17 years. Further, they were classified randomly into two equal groups of 20 ( $n=20$ ) subjects each. Group - I KTG underwent KT thrice a week for twelve weeks, and each session lasted for 45 minutes and Group – II - which was a control group (CG) did not undergo any special training apart from the regular activities. The cardiovascular endurance and explosive power were measured by 12min run and walk and

broad jump. The data were collected for all the members before and after the training session.

## TRAINING PROCEDURE

During the KT period, twelve weeks of KT was undertaken by the KTG on Mondays, Tuesdays, and Wednesdays along with their routine exercises. Every day the training lasted for one hour in the morning. The subsequent exercise was monitored in the training session, the schedule consisted of 10min warm up which includes jogging and dynamic stretches. After this, the subjects carried exercises like kettlebell swing, bent over rows each side, front rack reverse lunge, global squat, overhead pass, and snatch. The session ended with cool down and stretches routine for 15min.

## STATISTICAL PROCEDURE

The Analysis of Co-variance (ANCOVA) which has a set value of  $p<0.05$  was performed to find out the significant mean differences.

## RESULTS

The data collected prior and after the experimental period on cardiorespiratory endurance and explosive strength of KTG and WG was analysed and presented in table – I and II.

**TABLE – I**  
**ANCOVA FOR PRE AND POST DATA ON CARDIO RESPIRATORY ENDURANCE**  
**(Scores in Meters)**

Test	KTG	WG	SV	SS	df	MS	F
Pre- Mean	2211.50	2206.50	B	250.00	1	250.00	0.23
			W	40910.00	38	1076.58	
Post - Mean	2313.50	2212.50	B	102010.00	1	102010.00	49.43*
			W	78430.00	38	2063.95	
Adjusted Mean	2313.16	2212.83	B	100052.60	1	100052.60	47.65*
			W	77698.62	37	2099.96	

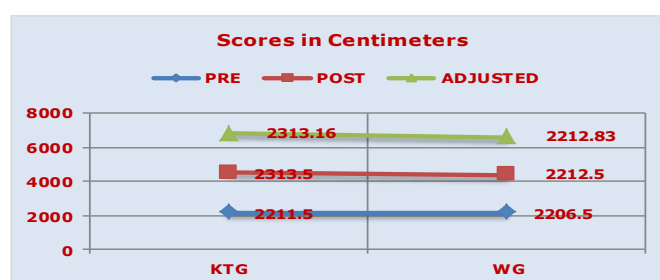
An examination of table – 1 indicated that the pre test means of Group – I KTG and Group – II WG was 2211.50 and 2206.50 respectively. The obtained F value for the pre-test was 0.23 and the F table value was 4.09 with df 1 and 38. Hence the pre-test mean F-ratio was insignificant at 0.05 level of significant. This proved that there was no significant difference between the KTG and WG indicating that the process of randomization of the groups was perfect while assigning the subjects to groups.

The post-test means of Group – I KTG, and Group - II WG was 2313.50 and 2212.50 respectively. The obtained F-ratio for the post-test was 49.43 and the F table F-ratio was 4.09

with df 1 and 38. Hence the post-test mean F-ratio was significant at 0.05 level of significant. This proved that the significant differences between the post-test means of the subjects were significant.

The adjusted post-test means of the Group – I KTG and WG was 2313.16 and 2212.83 respectively. The obtained F-ratio for the adjusted post-test means was 47.65 and the table F-ratio was 4.10 with df 1 and 37. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of significant. This proved that there was a significant difference among the means due to the KT on cardiorespiratory endurance.

**FIGURE 1: TEST DIFFERENCES ON CARDIO RESPIRATROY ENDURANCE**



**TABLE – II**  
**ANCOVA FOR PRE AND POST DATA ON EXPLOSIVE STRENGTH**  
**(Scores in Centimetres)**

Test	KTG	WG	SV	SS	df	MS	F
Pre- Mean	61.51	61.65	B	0.22	1	0.22	0.19
			W	42.88	38	1.13	
Post - Mean	64.67	61.65	B	91.11	1	91.11	<b>32.57*</b>
			W	106.29	38	2.80	
Adjusted Mean	65.00	62.39	B	93.32	1	93.32	<b>33.71*</b>
			W	102.43	37	2.77	

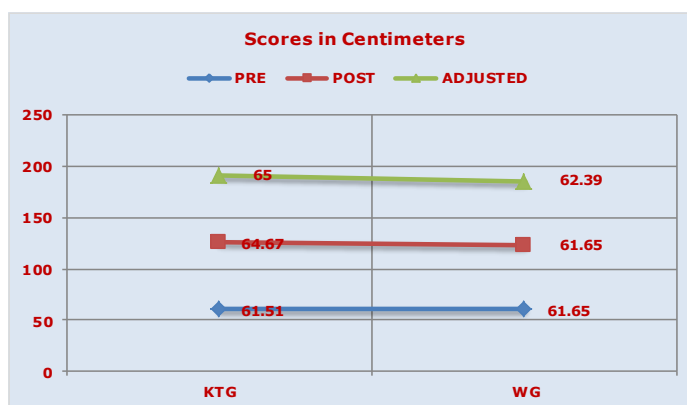
An examination of table – 2 indicated that the pre test means of Group – I KTG and Group – II WG was 61.51 and 61.65 respectively. The obtained F value for the pre-test was 0.19 and the F table value was 4.09 with df 1 and 38. Hence the pre-test mean F-ratio was insignificant at 0.05 level of significant. This proved that there was no significant difference between the KTG and WG indicating that the process of randomization of the groups was perfect while assigning the subjects to groups.

The post-test means of Group – I KTG and Group – II WG was 64.67 and 61.65 respectively. The obtained F-ratio for the post-test was 32.57 and

the F table value was 4.09 with df 1 and 38. Hence the post-test mean F-ratio was significant at 0.05 level of significant. This proved that the differences between the post test means of the subjects were significant.

The adjusted post-test means of the Group – I KTG and Group – II WG was 65.00 and 62.39 respectively. The obtained F-ratio for the adjusted post-test means was 33.71 and the F table value was 4.10 with df 1 and 37. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of significant. This proved that there was a significant difference among the means due to the KT on explosive strength.

**FIGURE 1: TEST DIFFERENCES ON EXPLOSIVE STRENGTH**



## CONVERSATION ON FINDINGS

The present study proved that a statistically significant result ( $p < 0.05$ ) in the value of the cardiorespiratory endurance and explosive strength among sports hostel women due to the training using the kettlebell. The study in line with Yudik Prasetyo and Ahmad Nasrulloh (2017) found that the weight training significantly improved the strengths of the leg muscle, back muscle, right grip and leg grip. Kumar & Sha, (2018) found that due to twelve weeks of resistance and aerobic training produced notable development on hand grip strength (HGS). Patel Amit & Joshi Makarand (2017) indicates that due to resistance training vital capacity has been improved significantly. Hiremath, Gnanaraj, & Muthuraj (2020) found that concurrent resistance and endurance training significantly increased the forced vital capacity. Parasuraman (2018) concluded that KT improved the core strength and muscular endurance in volleyball players.

## CONCLUSION

From the statistical results the KT had influence to develop the physical variables such as cardiorespiratory endurance and explosive strength among the sports hostel women. From the above results we recommend to

the coaches and physical educators should include in their training programme to reach the optimum performance among the athletes.

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**Funding**

This study was not funded by any grant

**Acknowledgements**

The authors would like to thank every participant for his effort and time.

**Conflict of interest**

None of the authors have any conflicts of interest to declare.

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**How to cite this Article**

**D.Shanthi and Dr.S.Akila** Effect of kettlebell training on selected physical variables among sports hostel women. Bharathiar National Journal of Physical Education and Exercise Sciences 13(3) (2022) 72-79



**Influence of Physical Exercise with Hatha Yoga Practices on Selected  
Physiological Variables among Inter College Level Men Volleyball Players**

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**Abstract**

This study was designed to influence of physical exercise with hatha yoga practices on selected physiological variables among inter college level men volleyball players. To achieve the purpose of the study 30 inter collegiate men volleyball players were selected from Dr.N.G.P Arts and Science College Coimbatore. Their age ranged between 18 and 23 years and they were divided into two equal groups consists of 15 each. Group I underwent the hatha yoga Practices and Group II acted as control group. Physiological variables systolic blood pressure and diastolic blood pressure was measured by using Sphygmomanometer. The training was given to the experimental group for 3 days per week for the period of 12 weeks. The control group was not given any sort of training except their routine work. The data were collected from the subjects was statistically analyzed with paired 't' test to find out significant improvement if any at 0.05 level of confidence. The results speculated that the systolic blood pressure and diastolic blood pressure of inter college level men volleyball players improved significantly due to the influence of physical exercise with hatha yoga practices with the limitations.

**Key words:** Physical Exercise, Hatha yoga Practices, systolic blood pressure and diastolic blood pressure.

## INTRODUCTION

Yoga is universally benefiting all people of all ages. The study of Yoga is fascinating to those with a philosophical mind and is defined as the silencing of the mind's activities which lead to complete realization of the intrinsic nature of the Supreme Being. It is a practical holistic philosophy designed to bring about profound state as well as an integral subject, which takes into consideration man as a whole. The aim of Yoga is to devise ways and means of helping the better emotional and intellectual concentration.

Yoga is a science of right living and it works when integrated in our daily life. It works on all aspects of the person: the physical, mental, emotional, psychic and spiritual. The word yoga means unity or oneness and is derived from the Sanskrit word yuj which means to join. This type of effort is possible only through the control over sense organs and through continued practice and detachment. The withdrawal of sense organs from the worldly objects and their control is Yoga.

## PHYSICAL EXERCISES

Physical exercise is any bodily activity that develops and maintains physical fitness and overall health. It is often practiced to strengthen muscles and the cardiovascular system, and to

hone athletic skills. Frequent and regular physical exercise boosts the immune system, and helps prevent diseases of affluence such as heart disease, cardiovascular disease, Type 2 diabetes and obesity. It also improves mental health and helps prevent depression. Physical exercise is important for maintaining physical fitness and can contribute positively to maintaining healthy weight, building and maintaining healthy bone density, muscle strength, joint mobility, promoting physiological well-being, reducing surgical risks, and strengthening the immune system. Frequent and regular aerobic exercise has been shown to help prevent or treat serious and life-threatening chronic conditions such as high blood pressure, obesity, heart disease, Type 2 diabetes, insomnia, and depression. Strength training appears to have continuous energy-burning effects that persist for about 24 hours after the training, though they do not offer the same cardiovascular benefits as aerobic exercises do. Exercise can also increase energy output and raise one's threshold for pain.

There is conflicting evidence as to whether vigorous exercise (more than 70% of VO<sub>2</sub> Max) is more or less beneficial than moderate exercise (40 to 70% of VO<sub>2</sub> Max). Some studies

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have shown that vigorous exercise executed by healthy individuals can effectively increase opioid peptides (aka endorphins, a naturally occurring opiate, that, in conjunction with other neurotransmitters is responsible for exercise induced euphoria and has shown to be addictive), positively influence hormone production (i.e., increase testosterone and growth hormone), benefits that are not as fully realized with moderate exercise. Exercise has shown to improve cognitive functioning via improvement of hippocampus-dependent spatial learning, and enhancement of synaptic plasticity and neurogenesis. In addition, physical activity has shown to be neuroprotective in many neurodegenerative and neuromuscular diseases. For instance, it reduces the risk of developing dementia. Furthermore, anecdotal evidence suggests that frequent exercise may reverse alcohol-induced brain damage. Physical activity is thought to have other beneficial effects related to cognition as it increases the levels of nerve growth factors, which support the survival and growth of a number of neuronal cells.

### **HATHA YOGA**

Hatha yoga is a branch of Yoga, one of the six schools of Hinduism. The word haṭha literally means "force"

and thus alludes to a system of physical techniques. In India hatha yoga is associated in popular tradition with the 'Yogis' of the Natha Sampradaya through its mythical founder Matsyendranath. Matsyendranath, also known as Minanath or Minapa in Tibet, is celebrated as a saint in both Buddhist and Hindu tantric and hatha yoga schools. However, James Mallinson associates hatha yoga with the Dashanami Sampradaya and the mystical figure of Dattatreya. According to the Dattatreya Yoga Śāstra, there are two forms of hatha yoga: one practiced by Yajñavalkya consisting of the eight limbs of ashtanga yoga and another practiced by Kapila consisting of eight mudras. Currently, the oldest dated text to describe hatha yoga, the 11th century CE Amṛtasiddhi, comes from a tantric Buddhist milieu. The oldest texts to use the actual verbiage of hatha are also Vajrayana Buddhist.

In the 20th century, hatha yoga, particularly asanas (the physical postures), became popular throughout the world as a form of physical exercise, and is now colloquially termed simply as yoga. According to Mallinson, some Hatha Yoga techniques can be traced back at least to the 1st-century CE, in texts such as the Sanskrit epics (Hinduism) and the Pali canon (Buddhism).

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The Pali canon contains three passages in which the Buddha describes pressing the tongue against the palate for the purposes of controlling hunger or the mind, depending on the passage. However, there is no mention of the tongue being inserted into the nasopharynx as in true khecarī mudrā. The Buddha used a posture where pressure is put on the perineum with the heel, similar to modern postures used to stimulate Kundalini.

## METHODOLOGY

Purpose of the study was to find out the physical exercise with hatha yoga practices on selected physiological variables among inter college level men volleyball players. To achieve the purpose of the study 30 inter collegiate men volleyball players were selected from Dr.N.G.P Arts and Science College Coimbatore. Their age ranged between 18 and 23 years and they were divided into two equal groups consists of 15 each. Physiological variables

systolic blood pressure and diastolic blood pressure was measured by using Sphygmomanometer. Group I underwent the hatha yoga Practices and Group II acted as control group. The training was given to the experimental group for 3 days per week for the period of 12 weeks. The control group was not given any sort of training except their routine work. During the training period the experimental group underwent the training of physical exercise with hatha yoga practices for twelve weeks of period in addition to their daily routine activities as per the curriculum. Experimental group underwent training program on three days per week for twelve weeks period. All the subjects involved in this study were carefully monitored throughout the training program, none of the reported with tear and muscle soreness. The data collected from the subjects was statistically analyzed with paired 't' test to find out significant improvement if any at 0.05 level of confidence.

## RESULTS

**TABLE - I**  
**ANALYSIS OF 'T' RATIO FOR THE PRE AND POST TEST OF EXPERIMENTAL AND CONTROL GROUP ON SYSTOLIC BLOOD PRESSURE AND DIASTOLIC BLOOD PRESSURE**

Variables	Group	Test	Mean	SD	MD	SEM	t-ratio
<b>Systolic Blood Pressure</b>	Experimental Group	Pre test	111.55	1.09	5.75	0.27	20.55*
		Post test	117.30	0.80			

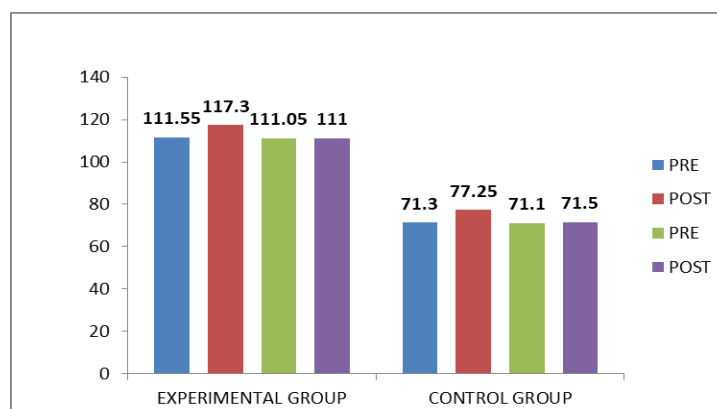
<b>Diastolic Blood Pressure</b>	Control Group	Pre test	111.05	1.05	0.55	0.33	1.63
		Post test	111.0	1.14			
	Experimental Group	Pre test	71.30	1.03	5.95	0.25	23.22*
		Post test	77.25	1.01			
	Control Group	Pre test	71.10	0.78	0.40	0.21	1.90
		Post test	71.50	0.82			

(Significance at 0.05 level of confidence for df of 14 is 2.14)

Table I shows that the pre test mean values of experimental group and control group 111.55, 111.05 and 71.30, 71.10 respectively and the post test mean values are 117.30, 111.0 and 77.25, 71.50 respectively. The obtained dependent t-test between the pre and post test means on systolic blood pressure and diastolic blood pressure of experimental group and control group are 20.55, 23.22 and

1.63, 1.90 respectively. The table value required for significant difference with degrees of freedom 14 at 0.05 level of confidence is 2.14. The obtained 't' test value of experimental group was greater than the table value. The results clearly indicated that the systolic blood pressure and diastolic blood pressure of the experimental group improved due to the physical exercise with hatha yoga practices on college level men volleyball players.

**FIGURE –I**  
**ANALYSIS OF 'T' RATIO FOR THE PRE AND POST TEST OF EXPERIMENTAL AND CONTROL GROUP ON SYSTOLIC BLOOD PRESSURE AND DIASTOLIC BLOOD PRESSURE**



## DISCUSSIONS ON FINDINGS

The result of the study indicates that the experimental group (physical exercise with hatha yoga practices group) produced significant improvement on systolic blood pressure and diastolic blood pressure due to the influence of physical exercise with hatha yoga practices. Supported the mean, this examination bolsters the findings of Hagins et al.,2007, Harinath et al., 2004, Jack et al., 1988, Jereth et al., 2006 Jovanov 2005, Ramos et al., 2009 and Ray et al., 2001 when compared to the control group.

## CONCLUSION

The physical exercise with hatha yoga practices group had registered significant improvement on systolic blood pressure and diastolic blood pressure when compared to the control group.

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### **Funding**

This study was not funded by  
any grant

### **Acknowledgements**

The authors would like to thank  
every participant for his effort  
and time.

### **Conflict of interest**

None of the authors have any  
conflicts of interest to declare.

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### **How to cite this Article**

**Mr.A. Thanasingh** Influence of physical exer-  
cise with hatha yoga practices on selected phys-  
io-logical variables among inter college level  
men volleyball players. Bharathiar National  
Journal of Physical Education and Exercise Ex-  
ercise Sciences 13(3) (2022) 80-87