



Study of Yoga Intervention on Volleyball Players in West Bengal

Dr. Soma Das

Principal, Lieutenant Abhishek Ray Chaudhuri Teachers Training College, Sonarpur, Kolkata-700150.

Email: somad.cal@gmail.com

Abstract:

The study was conducted to assess the effect of Yoga practices on young male volleyball players in Howrah, West Bengal. A group of thirty male volleyball players of age 15yrs to 20years were selected by stratified random sampling technique from a well-known volleyball club in Howrah district of West Bengal. The human subjects were performed yoga for a period of six months. Several physical fitness parameters like explosive muscular strength, muscle endurance, cardiorespiratory fitness (VO^{2max}), flexibility was measured by standard methods before and after the period of yoga practice. The result revealed significant improvement of muscle flexibility, and cardiovascular fitness (VO^{2max}) after the performance of yoga exercised for a period of six months. However, no significant improvement in aerobic power and explosive leg muscle strength were noted after yoga performance period than the before yoga phase.

Keywords: Volleyball, Yoga, Muscle strength, VO^{2max} , Flexibility.

Introduction:

Physical fitness is a state of health and well-being in which someone is able to perform physical activity and maintain a healthy lifestyle. There are many benefits to being physically fit, including improved overall health, reduced risk of chronic diseases, improved mental wellbeing, and better physical performance. Being physically fit is important for everyone, regardless of age or activity level. Everyone can benefit from being physically active, and there are many ways to get involved in physical activity. Whether an athlete, beginner or experienced, physical fitness is the prime concern for everyone. According to literature yogic exercises are very good means to enhance physical fitness. The word “yoga” comes from the Sanskrit root “yuj” which means “to join” or “to yoke”.

Yoga means to join or “yoke” together the mind, body and spirit. The aim of yoga for health is to bring balance into the body physically, mentally and emotionally. By connecting to ourselves through the breath, we can bring our bodies from a state of “dis-ease” to a place of health. The concept of ‘Ashtanga Yoga’ is so fascinating and interesting, one can learn a lot about spiritual and physical benefits through it. Some of the benefits of yoga for players are, new skills are learnt quickly than before, during practice & competition Recovery period is reduced, helps to regulate and improve the psycho-somatic programming of the body and it makes the players more attentive. In India among the topmost group sports, volleyball deserves special

mention. Volleyball is a game which is world-wide famous, team sport in which two teams of six players are divided by a net.

In modern volleyball, there are some reformations in the game and today volleyball is one of the most popular games in history. The character of volleyball game is entirely different than that of other sports discipline. Rotation system is a unique feature that differentiates volleyball from other sports. Previous study has shown significant improvement in some of the variables like improvement of flexibility, skill improvement (front pass, back pass, spiking, blocking ability, service), improved fitness variables (speed & flexibility), increased psycho-motor coordination-more control over mind to give 100% in a game and be focussed all the time, cardio-vascular endurance improvement, development of spiking speed, counter movement jump(CMJ), peak power and speed of upper limb, increased leg explosive power due to regular practice of Surya namaskar(sun salutation), decreased psycho-physical stress and mental strain, improved back strength due to regular and proper practise of yogic exercises and asanas. It is reported that yogic practices can bring in several benefits in the psycho-somatic aspect of volleyball players.

Psychological aspects of yoga can bring in immense psychological changes in the athletes. Studies prove that yoga has a capacity to influence the brain, to increase alpha wave activity in the frontal lobes indicating relaxation of the thinking processes, to increase theta wave activity, which seems to indicate enhancing creativity, imagery, and insight, and to generally synchronise, harmonise and Integrate brain functioning. Analysis of literature revealed there is handful studies on the effect of yoga on volleyball players in India. Observation on yogic practices of volleyball players could be a necessary tool to create the 6 players more eligible for the elite game and to win medals. Till now the effect of yoga on the agility of the volleyball players is still unknown in Indian scenario. The effect of yoga on the concentration power of volleyball players is inconclusive. The functioning of brain waves during volleyball tournament is also a much-needed study that can be done. Following these research gaps in Indian scenario, the present project has been focused on the effect of yogic practices on Indian more specifically Bengali volleyball players.

The study on endurance is also not significant or the effect of yoga on the endurance is also not known very effectively. Some skill related studies are there in Indian context but they are not as good as to conclude any significant result. In other countries studies with better test procedure and equipment and better machinery facility have proven how much effective yogic exercises could be in the betterment of volleyball players in both young and adult stage. We need more studies related to yoga to improve our sport of volleyball and other sports too. Following these research gaps in Indian scenario, the present project has been focused on the effect of yogic practices on Indian more specifically Bengali volleyball players

Review of Literature:

There are a few studies happened before in Indian origin volleyball players and of foreign players in which some of them have shown some significant results:

Skill improvement, studies have shown that proper yogic exercises can improve the skills needed in the ground of volleyball if they are practiced in a regular manner and in a right perfect way. Front pass, back pass, service, spiking, blocking ability are certain skill areas where proper yogic exercises and asanas can bring in much improvement (Patil & Bera, 2018).

Flexibility of small area games, namely there are studies in Indian context and which are performed on Indian volleyball players that has shown the significant results in favour of increased flexibility in small area games such as volleyball. Study shows how proper and regular yogic exercises brings in the improved flexibility in young athletes (Rajasuthakar & Sebastian, 2019).

Improvement of fitness variables like speed and flexibility. Speed and flexibility were taken as dependent variables and a group of young volleyball players were taken in account to conduct the program on. The

study shows that there is a significant improve in the fitness variables after a few weeks of regular and proper yogic training by professionals (Mala & Pushpa, 2021).

Increased psychomotor coordination, gaining control over mind and body and thus the attention and concentration span and cardio-vascular endurance improvement, helping in enhancing the sports performance of the players. Study has shown that regular and proper yogic exercises practicing can bring in enhanced psychomotor coordination. This helps in gaining more control over the mind and body throughout the game or tournament, relaxes mind and make an athlete more dangerous for opponents (Nagaraj & Manjunatha, 2019).

Development of spike speed, counter movement jump (CMJ) height, peak power & increasing speed of upper limb, total performance enhancement of young female volleyball players. This study was mainly conducted in Turkey. Significant results showed that the regular practice of proper yogasanas can bring in enhanced spiking ability and speed of upper limb. (Agopyan, Ozbar, Ozdemir, 2018).

Decreasing degree of sports anxiety, a study has shown that after a continuous practice of proper yogasanas sports anxiety levels are decreasing in volleyball players. The sports anxiety can create a major competitive anxiety and stress. Yoga is a thing which can regulate psychological state of an athlete and decrease the sports anxiety and stress level by its own virtue of spirituality (M Lakshman Kumar, 2019).

Surya namaskar is such a yoga which is so beneficial for all kinds of sports but in volleyball it is especially beneficial in many ways, one of the studies has shown that due to practice of 7 Surya namaskar in a regular basis full body muscle gets toned up, especially the lower limbs get toned up, explosive power increases of lower limb (Elumalai & Pajanivel, 2020).

Improvement of back strength is so significantly seen in a study in which daily practice of yogic exercises enhanced the core strength and back strength of volleyball players. Surya namaskar helps in increasing the back strength of the athletes, it helps in a vigorous way in which enhancing back strength is included. It increases the flexibility also in a certain manner (Durai & Anantharaj, 2019).

Aim & Objectives:

The aim of the study was to observe the effect of yoga on Bengali volleyball players.

The objectives of the study were:

- To observe physical fitness status of young volleyball players.
- To evaluate the effect of yoga on fitness profile of the young volleyball players.
- To observe effect of yoga on healing injury if any.
- To note the effect of yoga on pain relief in those volleyball players.

Methodology:

In the study, survey was started and data were collected from “Bally Deshbandhu Club”, young male volleyball players of age group 15 to 20 were taken into account. The survey was started and data were collected from “Bally Deshbandhu Club”, Howrah, West Bengal. Young male volleyball players of age group 15 to 20 were taken as subjects for the study.

- **Sampling**

To study stratified random sampling technique has been applied for the selection of volleyball

players. There were all together fourteen players participated in the study. All players reside in the district of Howrah, West Bengal.

- **Inclusion Criteria**

1. Regular volleyball players were included into this study.
2. Volleyball players without any present injury were taken for the study.
3. Male volleyball players were considered.
4. Age group of 15 to 20 years were only considered.

- **Exclusion Criteria**

1. Female athletes were not considered.
2. Sports anxiety was not considered in this study.
3. Currently injured players were not taken into the study.
4. Volleyball players without regular practice had been excluded for the study.
5. Players of more than 20 years were not considered into account.

Study Design

The study was done on 14 Volleyball players of age group 15-20 in a Volleyball academy in Bally, Howrah. The present study was conducted by taking verbal consent of the participant players and the authority of the volleyball academy. The entire study was done in 3 phases before & after practice of yoga i.e., pre & post exercise states. In pre-exercise state, the first phase was focused on collection of data of the physical parameters like height, weight etc. In second phase, data on physiological parameters like blood pressure, heart rate and so on were measured. In the third phase physical fitness parameters like flexibility muscle strength and so on were measured by applying standard procedure. The same protocol was followed for post exercise state.

Materials used

The materials which were used in this process are:

- Measuring tape
- Stopwatch
- Pulse oximeter (SpO₂)
- Blood pressure monitor (digital) & Sphygmomanometer
- Stethoscope
- Weighing machine
- Hand Grip Dynamometer
- Sit & Reach Box

Basic background and educational information (age, educational status, parents' educational status and jobs, socio-economic status, nutritional status, previous injuries if any) were taken from the volleyball players. Basic physiological parameters were taken (like height, weight, waist circumference, hip circumference etc.) by standard methods.

- **Test applied for measurement of fitness are:**

1. Determination of VO₂ max
2. Determination of Aerobic power
3. Determination of Explosive Muscular Strength
4. Measurement of Flexibility
5. Determination of Agility (Shuttle Run Test)
6. Measurement of Muscular Endurance
7. Hand-grip Strength Tests

- **Yoga & Yogic exercises for the Players**

To observe different kind of physical and physiological changes a list of yoga practices has been conducted and asked to be practiced for at least 4 weeks. The list of yogas is: Warm Up 1. Head rotation 2. Neck rotation 3. Shoulder rotation 4. Hip rotation 5. Trunk twisting 6. Lying knee fold hip rolling 7. Lunges 8. Jumping jacks Asanas: 1. Padahastasana 2. Ekpadasana 3. Tadasana 4. Bhujangasana 5. Ardha Chakrasana 6. Surya Namaskar Pranayama: 1. Anuloma Viloma 2. Bhramari Cool Down: Savasana 12

- **Statistical Treatment:** All primary data were subjected to statistical treatment for analysis of result. Here data obtained during pre and post yogic practices were used to calculate Mean and Standard Deviation (SD). After that mean scores of both stages of all parameters were subjected to significant tests by applying student t-test. Significance level was set at 0.05.

- **Null hypothesis**

There is no significant effect of yoga practices between the pre & post yoga dataset. Condition for the acceptance of null hypothesis is- The Critical t value > calculated t value. Alternative Hypothesis of t-test- There is significant effect of yoga practices between the pre & post yoga dataset. Condition for the acceptance of alternative hypothesis is— The Critical t value < calculated t value.

Results:

The results depict that in some parameters there are certain changes which are seen due to yoga practice for a period of six months. After the yoga program some changes were seen which were taken by the same set of physiological fitness tests and basic physical parameters. All fitness tests were conducted pre and post Yoga practices. The changes in mean values have been depicted in the following table.

The degree of freedom of the seat & reach test before and after yoga is 13. The calculated t value of the test is 1.238 at 0.05 significance level. The critical value of t at degree of freedom, df=13 & significance level 0.05 is 1.771 & the calculated SD value is 1.081. Hence the calculated t value is greater than critical t value so alternative hypothesis is accepted i.e., a significant improvement of muscle flexibility after yoga.

The degree of freedom of the 60-yards dash test before and after yoga is 13. The calculated t value of the test is 1.127 at 0.05 significance level. The critical value of t at degree of freedom, $df=13$ & significance level 0.05 is 1.771 & the calculated SD value is 0.045. Here the calculated t value is less than critical t value so null hypothesis is accepted i.e., no significant improvement of aerobic power after yoga.

The degree of freedom of the vertical jump test before and after yoga is 13. The calculated t value of the test is 0.931 at 0.05 significance level & the calculated SD value is 0.305. The critical value of t at degree of freedom, $df=13$ & significance level 0.05 is 1.771. Here the calculated t value is less than critical t value so null hypothesis is accepted, so there is no significant improvement explosive leg muscle strength after yoga.

The degree of freedom of the determination of VO₂ max by Queen's College step test before and after yoga is 13. The calculated t value of the test is 3.452 at 0.05 significance level & the calculated SD value is 1.570. The critical value of t at degree of freedom, $df=13$ & significance level 0.05 is 1.771. Here the calculated t value is greater than critical t value so alternative hypothesis is accepted, so there is a significant improvement in VO₂ max after yoga.

The degree of freedom of the determination of sit up test per min before and after yoga is 13. The calculated t value of the test is 4.704 at 0.05 significance level & the calculated SD value is 1.081. The critical value of t at degree of freedom, $df=13$ & significance level 0.05 is 1.771. Here the calculated t value is greater than critical t value so alternative hypothesis is accepted, so there is a significant improvement in muscular endurance after yoga.

Table: Mean Differences of Selected Fitness Parameters Pre and Post Yoga		
	Before Yoga Practice	After Yoga Practice
1. Seat & Reach Test	7.8	8.1
2. Aerobic Power Testing-60 Yard Dash timing (sec)	10.50	10.43
3. Vertical Jump Height (in cm)	45.82	45.96
4. Determination of VO ₂ max (ml/kg/min)	49.59	50.79
5. Determination of Muscular Endurance (Sit up per min)	32.14	33.50

Discussion:

The present experiment study was to find out the physical fitness parameters of the volleyball players and the effect of yoga on the fitness parameters and core strength. Regular practice of yoga for a few weeks should have the effect on the muscle fibres and core strength and overall fitness of the players. The regular muscle contraction & relaxation gives out improved structure of muscle fibres. The overall flexibility increases due to this yoga practice. The regular practice of dynamic yoga like Surya Namaskar can bring in much more

core strength. Yoga practice increases the flexibility, core strength, anaerobic power, endurance etc. The tests were performed on the field to measure those parameters. Yoga practice increased the flexibility of the players which is clear from the table 4(seat & reach test) where we can find significant statistical improvement in the results. Abdominal, shoulder, hand flexibility has been improved to certain extent. Similar study had also the same proof that yoga practice can bring in improved flexibility in the volleyball players (Mala & Pushpa, 2021). Here in this study no significant improvement is seen in the aerobic power of the players. Studies (Agopyan, Ozbar, Ozdemir, 2018) showed that yoga can induce better explosive muscle strength in the legs, but in this study, we got no statistically significant improvement in the explosive muscle strength. It may be due to the shorter span of the study or the shorter span of yoga practice. The hand grip tests also show no significant improvement in the grip strength after yoga practice. Table 8 shows that there is a statistically significant improvement in the maximum oxygen consumption of the volleyball players after yoga practice. The mean VO₂ max and pre post data shows a good improvement in maximum oxygen consumption leading to a better endurance. The agility of the volleyball players has been measured in the table 9. It shows an improvement in the agility of the players after 4weeks of yoga practice along with their basic exercise and tactics practice. As the agility increases significantly there must be a better outcome and effort expected from the players. Previous studies (Vigneshwaran, 2016) showed that yoga can regulate the core strength of the players also. Practice of some dynamic and core strength increasing asanas can bring in increased core strength after a span of regular yoga practice. Table 10 shows about the improvement on muscular endurance and core strength by sit up test. This study proved a statistically significant improvement in muscular endurance and core strength after the regular yoga practice. It is not clear from the study that yoga can boost or alter every parameter but surely some of them. Like previous studies this study showed that yoga can improve the muscle endurance, flexibility, core strength, aerobic power. The research gap about the improvement of agility of the volleyball players in Indian scenario mostly in Bengal was still unknown but this study helps to observe that there could be a significant improvement of agility after yoga practice on regular basis.

Conclusion:

The effect of yoga intervention on young volleyball players for 4 weeks was not conclusive for every physical and physiological parameter, but it surely concluded some of the significant improvement of certain parameters. Unlike the physical parameters there could be seen statistically significant improvement in muscular endurance, core strength, flexibility, aerobic capacity and agility after 4 weeks of yoga exercise along with the normal exercise and tactics routine of the young players. From the overall statistics of the study, we can conclude that regular, proper and longer yogic practices can surely bring in better physical and physiological attributes in the young volleyball players participated in this study. Future Aspects of the Study: There could be so many future aspects of the study about the effect of yoga and meditation on psychological parameters and sports anxiety and diet. In future a more comprehensive study plan will be developed to reach a holistic conclusion on the effect of yoga on dietary habit and nutrition and mental health of the volleyball players.

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