International Journal of Physical Education and Sports Sciences
Vol. 14, Issue No. 01, January-2019, ISSN 2231-3745

Effect of Exercise and Yoga Training on Hockey Players

Dharmendra Pratap Singh[1]* Dr. Nilesh Nanasheb Bansode[2]

[1] Research Scholar, Swami Vivekanand University, Sagar, MP

[2] Associate Professor, Department of Physical Education, Swami Vivekanand University, Sagar, MP

Abstract – The opinion of many world class sports persons, it is found that the practice of yoga them to achieve greater skills in their sport. This is because yoga not only works on the physical level but also has benefits for the mental, emotional and energy levels. Yoga enables them to realize that how to control on emotions and perform better in sports because emotional factor is very important in any event or sports. Emotions are governed by the working of autonomic nervous system, which brings the emotional disturbances down yogic exercises as groups play a significant role in training the autonomic nervous system. In this view the investigators have made an effort to find out the effect of asana on psychological variables of Hockey players. For this, achievement players were randomly assigned into two groups; one experimental and the other, control group.

Key Words: Yoga, Anxiety, Perception, Control Group, Experimental Group, Yogic Asanas, And Hockey Players, Physical Fitness, Exercise.

----------♦----------

INTRODUCTION

Hockey in a field of equal size with the same number of players and for a similar length is considered one of the fastest and most competitive team sports. In terms of psychology, in many areas of soccer, field hockey is a close match. Although the players are sporadic in nature, the interval must be just 5 to 10 minutes for 70 minutes. It puts great stress on the aerobic system and needs strong aerobic resistance to repeated episodes of exercise of high intensity. Elite hockey players have high anaerobic strength and anaerobic resistance. While most of the game is used for activities like walking and jogging, repetitive sprints are necessary for players to use speed and resistance to lactic acid. For addition, stamina for a hockey fitness program is also important. While players are not expected to face physical obstacles (compared with other multirace sports), strength is needed to speed up and change direction rapidly. The strength of the upper body makes it possible for players to fire more effectively and cover more distances. The sport's specific requirements mean strength is as critical as explosive capacity. Careful preparation is important for the efficient growth and production of muscle force and endurance without causing unnecessary exercise and fatigue.

As the sport takes place on a synthetic surface, the body has different stresses than grass. Therefore, coaches and trainers need to provide these players with training programs that will optimize their skills. Exercises should be included which will match the physiological demands of the sport. In fact, field hockey involves both aerobic and anaerobic components. The development of motor skills, speed, body balance, stamina, and strength are possible outcomes of effective instruction in the sport of field hockey. The natural tempo of hockey is fast and involves interval aerobic and anaerobic activities. All the major muscle groups are activated during the game. Aerobic exercises stimulate both the respiratory frequency and the heartbeat. By so, calorie expenditure increases and as a result of this, body-fat mass decreases and the health of both the respiratory and circulatory systems improve. Further, hockey players must react fast through position changes during the game. Although numerous research studies on aerobic and anaerobic exercise training and hockey performance are carried out worldwide but there is little information available so far, evaluating the combined effect of exercise and yoga training on physical fitness especially for the elite hockey players. Further, earlier studies indicated that yoga practices improve vital capacity as well as motor abilities. Despite the benefits of yoga practices little or no scientific literature is available in case of sports performance. Hence, the researcher has planned this study to see the effect of conventional exercise training followed by yoga practices among hockey players.

REVIEW OF LITERATURE

Stanula et. al. (2014) have determined relationship between fatigue &aerobic capacity in elite male hockey players. The participants were 24 males from national ice hockey team of Poland, who have been playing in the team as defender or attacker. Each subject completed a Sprint-Skate Sprint on Ice (RSS) test consisting of 6 timed sprints of 89 m, with 30 s resting between successive efforts and an incremental test on a laboratory cycle ergometer, whose goal was to establish maximum consumption of oxygen. Analysis showed that each sprint repetition in the 6x89 meter test was longer than previous one ($F5, 138 = 53.33$, $p < 0.001$). Analysis of fatigue index (FI) calculated from the times recorded for the sprint repetitions showed that the value of the fatigue index increased with the repetitions, reaching its maximum between repetitions 5 and 6 (3.10 ± 1, 16%). The total fatigue index was 13.77 ± 1.74%. The correlation coefficient between maximum oxygen consumption& the total fatigue index for 6 sprints in the distance of 89 m ($r = -0.584$) was significant ($p = 0.003$). Although the test is criticized for being too exhaustive and, therefore, to produce highly variable results, it still seems to have been well selected for repeated tests of hockey players' career skills.

Villarreal et al., (2010) studied effect of eight-week periodic plyometric training on jumping & chair performance in 3 groups of women with different age groups. The survey included a group of 55 women between the ages of 40 and 70 who have no PT-based experience and have taken part in a five-year gymnastics and recreational programme. Both tests were conducted prior to (PRE), after (POST) and after eight weeks of rest, (detraining), and after strength values, vertical jump performance (VJP) and distance. Performance tests in 3 days have been completed. The key results of this study indicate that the low impact PT, with a medium volume of hips, has contributed to significant gains in chair jumping and improved success in the three-age women's groups (30 CST) (15-24%). For any chosen age group in a 10-minute race no improvement was observed.

Villarreal et. al., (2008) examined the effect of three different plyometric frequencies (for example, 1 day a week, two days a week, four days a week) associated with 3 volumes of different plyometric at maximum strength, performance vertical jump, and the ability to run. 42 students are allocated randomly in one of 4 classes (n = 10, 7 DJ trainings), 1 day a week, 420 DJ trainings (n [12], 2 days of week, 840 DJ's), and 28 DJ sessions (n = 9, 4 days per week, DJ 1680). Random trainings for 1 of four groups. Training protocols including DJ 3 different heights of 20, 40 and 60 cm. The maximum forces (1RM and maximum isometric strength), the vertical height of counter motion springs and DJs, and the 20 m time testing speed before and after 7 plyometric weeks were performed. No major differences have been found in any of the variables measured between previous training classes. In any of the variables analyzed at all times, no major changes were reported in the control group. Plyometric short-term training with low training rates and mass jumps (2 days a week, 840 hops), but a higher level of training efficiency (12% or 0.0% or 0.014% in leap) than higher jumps, with 4 days a week (1680% or about 18% and 0.011% in the jump). However, in comparison to high exercise rates, comparable improvement in the 20 m period, jump time and maximum strength were seen in moderate and low number training courses per week, given the fact that the average number of jumps carried out in 7S (420 jumps) and 14S (840 jumps) was 25% and 50% (1680 jumps) of 28S. These findings will play a significant part, as moderate volume is more successful than greater plyometric volume, to improve the production for plyometric training programs for athletes.

Aziz, Chia and The (2000) examined the relationship between maximum oxygen uptake and repeated sprint performance in field hockey and soccer players. A descriptive study was conducted as a center of research and sports medicine on the aerobic-anaerobic performance of intermediate players of team games. Forty players of the male national team participated in the study (22.6 +/- 4.2 years, 1.73 +/- 0.07 m and 63.7 +/- 6.2 kg). All subjects completed a treadmill by performing an exhaustion test to determine the maximum oxygen consumption and the 8x40 m sprints, both in the field and on the track, to determine the repeated performance of the sprint capacity. It is still possible that a high level of aerobic fitness improves other aspects of the game in games like football and hockey.

Kubo et. al., (2007) studied the effects of plyometric protocols and weight training on the mechanical properties of the muscle-tendon complex and the activities and muscular performance during the jump. Ten subjects completed 12 weeks (4 days / week (-1)) of a unilateral training program for plantar flexors. They performed plyometric training on one side (PT, jump and jump with 40% of 1RM) and weight training on the other side (WT, 80% of 1RM). Tendon stiffness was measured by ultrasound during isometric plantar flexion. Three types of unilateral jump heights were measured using only the ankle joint (jump squat: SJ, jump countermovement: CMJ, jump forward: DJ) on a sled. During the jump the electromyographic activities of the plantar flexors and the tibialis anterior muscle were recorded. Joint stiffness was calculated as the variation of the articular pair divided by the ankle angle change during the DJ's eccentric phase. These results indicate that improvements in jumping performance after plyometric training are attributed to changes in the mechanical properties of the muscle-tendon complex rather than to muscle activation strategies.

Raghavalu (1990) conducted a study to find out the effect of plyometric exercises on physical fitness components. The one hundred male subjects aged 15-17 years were divided into experimental group

(n=50) and control group (n=50). The plyometric exercise training was administered to experimental group for total period of six weeks. At the baseline and after completion of experiment all the subjects were assessed for power, speed, agility and flexibility test. The results of this study revealed that plyometric exercises have positive effect on physical fitness component.

Delisle-Houde et. al., (2018) explored the relationship between seasonal variations in body composition, preseason testing of ice and ice measurements. Twenty Canadian hockey college players (22.70 ± 1.30 years, 181.0 ± 5.92 centimeters, 86.52 ± 6.41 kg) were subjected to physical ice tests at the start of the season and had a scan X-ray dual energy absorption system in the body Beginning and end of the season. The team's statistics monitored all the metrics on the ice. Pearson correlations have been used to explore the relationships between off-ice tests (long jump, vertical beep jump test and Wingate), changes in body composition (body fat percentage, visceral adiposity and total mass of lean tissue) and ice performance (average time on ice, average turnaround time, energy play time, penalty time and shooting range). long jump correlated with differential trigger ($r = -0.532$, $p \leq 0.05$) and average displacement length ($r = -0.491$, $p \leq 0.05$), while the fatigue index correlated with mean ice time ($r = -0.476$, $p \leq 0.05$). Hockey performance is a complex interaction of body player compositions and the physical shape of the skeleton that interact to influence game metrics on the ice.

YOGA IN SPORTS

Yoga has both preventive and therapeutic benefits. It has been proved beneficial for both physical and mental fitness. The many physical benefits of yoga are, it improves flexibility by losing the joint mobility, it builds muscles strength, spine, and corrects bad posture. Yoga will increase stamina of a player and creates balance and also stimulates the glands of the endocrine system, improves digestion and elimination, improves circulation and heart condition. All this is very helpful to the players to achieve better performance.

AEROBIC TRAINING

Any physical activity that causes you to breathe harder and increases your heart rate than at rest in presence of oxygen is aerobic exercise. The positive effects of regular aerobic exercise on health have been demonstrated in many studies. Nevertheless, the effects of physical activity on the different body systems differ depending on duration intensity, number of sessions, type of exercise, and age. Dynamic aerobic exercise is defined as rhythm misconstructions of skeletal muscle, with an intensity that would not produce an accumulation of lactate in blood, and could be maintained at least 20 minutes. Aerobic metabolism increases in proportion to the mass of muscle involved and the intensity of exercise. Blood flow also increases many folds. Cardiac output and heart rate increase three to four times with increasing oxygen uptake, whereas stroke volumes increases only to a minor extent. Repeated performance of dynamic aerobic exercise produces a training effect. The benefits are then maintained after the exercise is completed. Benefits obtained in the resting state are lower. Blood pressure, improved blood lipid profiles, and better heart efficiency. Generally, aerobic training promotes adaptations in the skeletal muscles, the cardiovascular system, the autonomic nervous system, and the hormonal responses. The responsiveness of an individual towards aerobic training is highly heritable and is determined genetically [1]. There is an increase in concentration of enzymes for the citric acid cycle, for fatty acid oxidation, and for the electron transport system. Now research has revealed that on exposure to aerobic exercise, endocrine functions of contracting muscles promote secretion of Myokines which is beneficial in the growth of new tissue, tissue repair and various anti- inflammatory functions]. The net result is an augmentation of the metabolic capacities that are associated with the International Journal of Physical Education, Sports and Health Mitochondria (and the respiratory capacity) and an increase in the use of fat as a source of energy. Aerobic exercise enables the use of oxygen to adequately meet energy demands during exercise via Aerobic metabolism. There is an increase in capillarization of the trained muscles; with both a greater number of capillaries per muscle fiber and a decrease of the area supplied by a single capillary. The Cardiovascular adaptations include a greater stroke volume and maximum cardiac output, and an enhanced ability to lower peripheral resistance during strenuous exercise. One of the most important consequences of the adaptation is the shift to greater reliance on fat as a fuel for muscular exercise. This occurs with glycogen-sparing effect that contributes to greater endurance capacity and with a reduction in plasma triglyceride concentration and an increase in high-density lipoprotein (HDL) mass, especially to increases in HDL2cholesterol and lipoprotein A-I. Aerobic exercise helps in Reducing the risk of diabetes [4].Another important aspect is the psychological benefit of aerobic activity as it reduces anxiety and depression and improves other life areas, including sleeping patterns and occupational satisfaction and efficiency.

PHYSICAL FITNESS

The state of wellbeing, especially the ability to perform aspects of sports, occupations and daily activities in efficient manner is referred as physical fitness. It can be achieved through proper nutrition regular physical exercise and sufficient rest. The United States President's Council on Physical Fitness and Sports defined the term physical fitness as "the

ability to carry out daily tasks with vigor and alertness without undue fatigue, with ample energy to enjoy leisure time pursuits and to meet unforeseen emergencies". General fitness implies the ability of a person to live most effectively with his/her potential, which depend upon the physical, mental, emotional, social and spiritual components of fitness which are highly interrelated. The primary components of physical fitness identified by the president's Council on Physical Fitness and Sports were muscular strength, muscular endurance and cardio respiratory endurance. However, later on the president council also included some other motor performance components namely agility, speed, flexibility and balance in physical fitness. The goals of an exercise programme will vary from individual to individual. Athletes for e.g. usually view exercise as a means of enhancing their athletic performance. The rest of us however are more likely to be interested in exercise as a mean of improving or maintaining our general health and fitness.

CONCLUSION

Training in physical workouts enhanced abdominal strength (anaerobic capacity) more effectively than yoga. However, yoga training was superior to training for physical exercise to make breathable and flexible. There were, therefore, superior hockey players and physical exercises for some of the fitness variables. In enhancing almost all the variables in health and success variable the combination training intervention (i.e. yoga + physical exercise) was substantially better than other training interventions. In addition, strength in a hockey training program is also critical. Although players are not expected to cope with physical challenges (in comparison with other multiracial sports), strength is important for acceleration, pace and rapid directional changes. The strength of the upper body makes it easier for players to shoot and traverse a broader range of distances. Sport's unique requirements mean strength as explosive strength. Careful planning is necessary to ensure the efficiency of muscle strength and muscle resistance without causing excessive exercise and tiredness.

REFERENCES

Stanula, A., Roczniok, R., Maszczyk, A., Pietraszewski, P. & Zając, A. (2014). The role of aerobic capacity in high-intensity intermittent efforts in ice-hockey. *Biology of sport*, *31*(3), pp. 193–199.

SaezSaez, E., De Villarreal, Requena, B., Arampatzi, F. & Salonikidis, K. (2010). Effect of plyometric training on chair-rise, jumping and sprinting performance in three age groups of women.*J Sports Med Phys Fitness, 50*(2), pp. 166-173.

de Villarreal, E. S., Gonzalez-Badillo, J. J. & Izquierdo,M. (2008). Low and moderate plyometric training frequency produces greater jumping and sprinting gains compared with high frequency. *J Strength Cond Res., 22*(3), pp. 715-725.

Aziz, A. R., Chia, M., & The, K. C. (2000). The relationship between maximal oxygen uptake and repeated sprint performance indices in field hockey and soccer players. *J Sports Med Phys Fitness, 40*(3), pp. 195-200.

Kubo, K., Morimoto, M., Komuro, T., Yata, H., Tsunoda, N. et al. (2007). Effects of plyometric and weight training on muscle-tendon complex and jump performance. *Med Sci Sports Exerc., 39*(10), pp. 1801-1810.

Raghavalu, S. (1990). *The study of the effect of plyometric exercises on selected physical fitness components of higher secondary school boys in Madras city*. Unpublished M. Phil. Theses, University of Madras.

Delisle-Houde, P., Chiarlitti, N. A., Reid, R. E. R., & Andersen, R. E. (2018). Relationship between physiologic tests, body composition changes, and on-ice playing time in Canadian collegiate hockey players. *J Strength Cond Res, 32*(5), pp. 1297-1302.

Corresponding Author

Dharmendra Pratap Singh*

Research Scholar, Swami Vivekanand University, Sagar, MP