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A Study of Exercise and Yoga on Health Related Physical Fitness of Hockey Players

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Abstract – The purpose of the study was to find out the effect of aerobic training on Physical Fitness components of hockey Players. Sports training is a pedagogical process, based on scientific principles, aiming at preparing sportsmen for higher performances in sports competitions. In the light of the meaning and definitions of sports training, the aim of sports training is to improve rapidly the sports performance of a sportsperson particularly in sports competitions, which is mainly based on his physical, psychological, intellectual and technical capacities and capabilities, In other words, the aim of sports training in competitive sports is to prepare the sports persons for the attainment of highest possible sports performance in competition. 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.

Key Words: Exercise, Yoga, Physical Fitness, Hockey Players, Sports Training, Sports Competitions

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INTRODUCTION

The origin of hockey can be traced in ancient Egypt, Persia, and Greece. It was developed in the British Isles in the late 19th century. In 1901, hockey was brought to the United States by an English woman, Constance M.K. Applebee. She spread the game to Vassar, Wellesley, Holyoke, Radcliffe, and Bryn Mawr Colleges. Her influence helped hockey grow in schools, colleges, and clubs. In 1920, the first US Touring Team set sail for England. However, in other countries hockey is widely played by both men and women. In 1993, the men's and women's associations merged into the USFHA, which is the official hockey organization recognized by the Olympic Committee.

Hockey is a popular game played all over the world. It is played either on a natural or on an artificial ground. The first ever in-house hockey club in India was formed in the year 1885-86 in Calcutta, and then followed the formation of hockey clubs in Bombay and Punjab. Slowly and gradually this game gained its importance amongst the masses in India and more and more people started playing it. In 1927, Indian Hockey Team participated first time in the world hockey match in New Zealand. The team put up a memorable show. The India fielded its hockey team for the first time in the Olympic Games at the 1928 in Amsterdam. From 1928 to 1956, the Indian men's team remained unbeaten in the Olympics, and won six gold medals in a row. From 1928 to 1976, the Indian team won a total of eight gold, one silver and two bronze medals in Olympics. The introduction of synthetic surfaces has significantly changed the sport of field hockey.

Anxiety

Anxiety is a mild fear reaction toward some stimulus. It is prevalent in even the best of athletes due to the immense pressures associated with professional sports. Anxiety is a normal response of an organism towards a physical threat or psychological distress, which generates a host of chemical and hormonal reactions in the body. It has two components; physiological and psychological which are mediated by neurotransmitter system. Researchers take steps to find out the level of sports anxiety through SCAT Questionnaire methods and to find some solution for the same. Yoga develops self-confidence and self-belief.

Perception

Many practitioners were drawn towards the theories and espoused by the early perceptual motor development as it greatly enhances the role of physical education. Perception is involved in all voluntary muscular movement, except reflex action. There is very little evidence to indicate a direct relationship between learning specific perceptual

motor skills, and learning to read and write. To get information, sensory input like sight, sound, touch, smell, taste as well as awareness of a body position, all these act as the components of perception. For any official movement, all their senses are used in integrated manners in complex motor activity. By regular engaging in a given activity perception can be improved.

REVIEW OF LITERATURE

Elferink-Gemser et. al. (2004) compared youth elite players in subgroups – youth elites (n = 88, average age 14.2 years, s = 1,26) in physiological aspects anthropological characteristics to assess the relationship between multidimensional skill features and success levels in talented young game-plays in the field of field hockey (n = 38, average age 13.2 years, s= 1,26) The multivariable analysis with the level of performance and sex as factors and age as a covariate showed that junior elite players had better results than sub-players in the technology (speak dribble tactics, repeat career drift tactics), in tactics (general tactics). Ball control, motivation and slalom dribble efficiency were the most decisive variables. The age of the two groups discriminated, indicating that the younger elite were younger than the elite. Tactical qualities, motivation and specific technical skills must be given greater attention to guiding the young talent as well as discovering talented players.

Faigenbaum *et. al*., (2007) compared the effects combined plyometric and resistance training or resistance training alone on fitness performance. The subjects aged 12-15 years were divided into plyometric plus resistance training group (n-13) and resistance training group (n=14). This lasted six weeks. The preparation took place. The members of both classes have been tested for vertical jump, long jump, medicine ball shooting, 9.1 m sprint, pro shuttle run and endurance checks at the beginning and at the end of the exercise. The results of this study indicated that plyometric group performed significantly better in long jump, medicine ball toss and pro-agility shuttle length than in resistance training group. These findings suggest that for enhancing upper and lower body power in athlete's plyometric training is more beneficial than the resistance training program.

Lemmink, Elferink-Gemser & Visscher (2004) A study was carried out to determine the reliability of the two hockey tests: the Shuttle SDT and the Slalom SDT. The study also assessed the reliability of the hockey tests. Two tests were made in four weeks of execution of shuttle shuttles and trips of 22 young male players and 12 female gamers. 21 young hockey players took part in a slalom sprint and attempted two times over a span of four weeks. The shuttle SDT asked the players to execute three 30 m routes alternating with shorter breaks and three 30 m routes alternating with a hockey ball after 5 minutes' rest. The Slalom SDT asked the players to compete for a slalom race and the same as a hockey ball after five minutes' rest. For mean time scores between the two test sessions there were no variations. The medium differences in comparison to the two test sessions were small. Save for the slalom acceleration time, it showed that there was no error between the two variables within the 95 % confidence range of the average differences. All intra-class correlation value for Shuttle SDT, with the exception of delta transmission time (0.79), fulfilled the reliability requirement of 0.80. The Slalom SDT coefficient values of intraclassic correlations were 0.91 for slalom speed, 0.78 for slalom speed drip and 0.80 for slalom distance. Shuttle SDT and Slalom SDT are accurate tests of young hockey players' pace and dribbling competitions.

Repeated Sprint Capacity (RSA) refers to an individual's ability to perform maximum short-term bursts in succession with little sprint recovery. The anaerobic race (RAST) speed test was adapted from the Wingate anaerobic test protocol (WAnT) as a tool to evaluate RSA and anaerobic power.

Keir, Theriault and Serresse (2013) were to evaluate the relationship between the performance variables and the physiological responses obtained during RAST and WAnT with 8 university football players. Participants performed a single WAnT and RAST test. Breathing gas after expiration was monitored during each trial and blood lactate (BL) measurements were recorded after exercise. The oxygen consumption profile (VO2) suggested that RAST required greater contributions of aerobic metabolism, although there was no difference in the VO2 peak ($p < 0.05$). Even the maximum BL values were similar between RAST and WAnT ($p < 0.05$). Neither the maximum physiological values nor the performance variables (peak and average power) were significantly correlated between the protocols. The weak association in physiological responses indicates that there are different combinations of metabolic contributions between protocols, suggesting that the individual performance in each test is not correlated in college football players. Further studies on these relationships with players of other competitive levels and team sports athletes are guaranteed.

Following repeated short episodes, high intensity exercise, the 5 m (5 m RST) repeated speed test tests fatigue resistance. The physical components correlated with RST 5 m results were determined by Durandt et. al. (2006). This review. The male province was tested for its sprint speed (10 and 40 m), stamina (bench), endurance and tensile strength (breathing and curves) and aerobic ability (20 m shuttle test). or rugby players of national level (n = 110), hockey (n = 59) or football (n = 55). These exhaustion has separated the body mass (14.55 + /- 0.40 seconds vs. 0.39 seconds + /- 15.59, < 0.001), bench (86 + /- 20 kg vs. 114 + /- 33 kg, P = 0.03), folds (13 + /- 8 + /- 4 vs. 5, p 02), folds (56 + /- 12 vs. 29 + /- 13, p+/- 20 kg vs. 114 + /- 33 kg, P = .003), and the check interchanger has 20 m (20 – m SRT; 1 + / – 12 vs. 37,

The best predictors of the RST results were the body mass, strength and aerobic power of 5 m: m = 1274 RST 5 (height) + 2.053 (SRT number 20 m) + 0756 (R2 = .65). RSM output of five metres, rather than a single physical aspect, is best predicted by a combination of factors like body mass, strength and aerobic ability.

In recent decades, there has been a greater emphasis on physical preparation among ice hockey college teams, in order to improve ice performance. However, it is not known if this increase in training has resulted in change of schedule to anthropometric and physical fitness profile of ice hockey college players. Triplett et al.(2018) describe the goal of this study in terms of their peer's anthropometric characteristics (height , weight, BMI, fat percent) and aerobic (oxygen maximum). For 36 years, Ice hockey teams determine how they distinguish between the players' positions. The physics of players (N=279) for the Men's ice Hockey team of the National Collegiate Athletic Association from 1980 to 2015 was obtained through the testing of anthropometric and physiology data. Regression analysis using linear and polynomial models has assessed change of the anthropometric and physiological variables over time and compares the differences in the player's position to that of ANOVA ($p < 0,05$). Regression analysis showed that better cubic models were predicted to vary from a mean height (R2 = 0.65), weight (R2 = 0.77) and IMO (R2 = 0.57) to a better fat per annum percentages (R2 = 0.30). In anthropometric features, no change was observed over time. Proponents were markedly higher as before, and the previous section had a maximum relative consumptions of oxygen in contrast to those of defense (58.7± 4.7vs 57.2 ± 44.4 mL•Kg-1•min-1) (p= 0.032), according to the protections. Proponents were substantially higher than the previous set. Of percent fat or weight per place no major variations have been reported. While the average player weight and height differed over time , greater emphasis was put on the aerobic ability of athletes, particularly in the field of physical training. Height and aerobic capacity differences between the positions of the players were observed.

Ray et. al. (2001) conducted a study to observe any beneficial effect of yogic practices during the training period for young people in training. 54 participants aged 20 to 25 were randomly divided into two groups, namely yoga and the control group. The yoga group (23 men and 5 women) received yoga practices during the first five months of the course, while the control group (21 men and 5 women) did not perform yoga exercises during this period. From the sixth to the tenth month of training, both groups performed the yoga practices. Physiological parameters were recorded such as heart rate, arterial pressure, oral temperature, resting skin temperature, response to maximum and submaximal exercise, body flexibility. Psychological parameters such as personality, learning, arithmetic and psychomotor skills and mental well-being were also recorded. Several parameters were taken before and during the fifth and tenth month of training. At first, the new work / training atmosphere on both sides made it slightly more positive, but slowly dropped. The yoga group then had very less sympathetic activity than the control group in the fifth and tenth months. The efficiency of the submaximal exercise level and the anaerobic threshold in the community of yoga has been improved. Shoulders, knees, spine and neck flexibility in the group yoga. Several psychological factors have increased, such as decreased anxiety and depression and improved mental performance following yoga practice.

Chen et. al., (2009) studied the effect of yoga exercise in the gym related to the health of school-age children with asthma. The study used quasi-experimental design research in which 31 volunteer children (group 16 exercises; group control15) aged 7 and 12 were sampled from a public elementary school in Taipei County. The yoga training group has practiced for seven consecutive weeks three times a week. 60 minutes of breathing and warmer exercises, 40 minutes of yoga positions and 10 minutes of cooling were included in each yoga session. Health outcomes were reviewed at the pre-exercise (baseline) and 7 and 9 weeks after the procedure was completed. A total of 30 individuals followed up (training group 16, control group 14). Outcomes included: 1. For the five physical elements of concern for children in the general population the participants (n=30) fall below the 50th percentile. The findings for the five elements of physical fitness were not significantly different between the two groups at the baseline (i.e. before practice). 2. The study found a positive association among asthmatic children between exercise habits after school, and muscle strength. 3. The workout group showed positive muscle flexibility and endurance performance compared to the control group. Even after age , illness and steroid modification, the values of which were unevenly distributed between the two groups at the start of the study, these positive results were also apparent. 4. There was a tendency in the exercise group to increase all element-specific fitness values over time. GEE analysis showed a BMI, endurance and muscle resistance enhancement of yoga exercise. The yoga exercise at home strengthened BMI, endurance, and muscle strength and heart pulmonary health after 2 weeks of personal training.

Hagins, Moore and Rundle (2007) aimed at 1) determining if the existing physical activity criteria to promote and sustain health and fitness are being met by a regular yoga practice using various positions. 2) determine the reliability of the yoga metabolic cost in session; 3) compare the metabolic costs of yoga practice with those of trekking in the stretch mill. cardiovascular conditions; This observational study has involved a routine exercise in a human respiratory chamber (indirect calorometer) with the

use of a heart frequency monitor by 20 intermediate to advanced yoga practitioners, aged 31,4 years + /- 8,3. The training routine was 30 minutes, 56 minutes of hata yoga and 10 minutes each at 3.2 and 4.8 km / h. The training routine was done in 30 minutes. Requirements included the daily intake of oxygen (VO2), cardiac levels (HR), the overall predicted cardiac result (percent MHR), metabolism equivalents (MET) and energy expenditure (kcal). In order to establish measurement reliability, seven subjects repetited the protocol. The mean values in the yoga session were 0.6L / kg / min, 93.2 beats / min, 49.4 percent, 2,5 and 3.2kcal/ min for VO2, HR, percent MHR, MET and energy / min , respectively. The result for ICC (2.1) was 0.979 and 0.973 and/or 0.865, respectively, for mean values during yoga for kcal, MET and% MHR. The caloric cost for yoga during the session is equivalent to walking a treadmiller at 3.2 km / h and the physical activity standard guidelines for improving or preserving health or fitness are uncommon. Power of the cardiovascular. The practice of Yoga that includes sun greeting poses over a brief 10 minutes span that leads to an intense part of physical activity in unsuitable or sedentary people, which will improve their cardiorespiracy. The calculation of energy costs is highly reliable in yoga sessions.

EFFECT OF YOGIC ASANAS ON HOCKEY PLAYERS

Yoga makes people stronger, healthier and more joyfully & cheerful. Yoga has been practiced in India from ancient time. Generally in chronological order are the Upanishad then the puranas and two epics, the Ramayana and the Mahabharata. Toward the end of the Vedic period comes the aphoristic literature, with the Patanjali of special interest to yoga students. Patanjali defined yoga as “a control of thought waves in the mind”. It is as wisdom in work or skillful living amongst activities of synchronization and moderation.

Y - Yearing for mental peace and all round fitness.

O - Organised scheme of physical movements.

G - General and specific workout involving total body mind spirit.

A - Advanced stage of concentration for mental alertness and total body homeostasis.

The physiological importance of yoga asanas gives adequate exercise to the internal organs of the body. yoga asanas impact on the mind and senses, it help to develop ones physical and mental powers to calm the mind and control senses As well as develop intellectual and spiritual development. The psychological importance of yoga asanas for sports is helping a player to become self-controlled and less level to limits of behavior by regulation endocrinal functions.

PROBLEM AND ITS RELEVANCE

Hockey is a physically demanding sport involving repeated bouts of high energy output, with shifts lasting from 30 to 80 seconds. Given the anaerobic nature of the sprint based shifts and the aerobic recovery between shifts and periods, as well as the physicality of the game, success at the elite level requires players to develop well rounded fitness including anaerobic sprint ability, a strong aerobic endurance base, and high levels of muscular strength, power and endurance. Physical fitness is training techniques used by athletes in all types of sports to increase strength and explosiveness. Physical fitness exercise consists of a rapid stretching of a muscle (eccentric action) immediately followed by a concentric or shortening action of the same muscle and connective tissue. Success in many sports depends heavily upon the athlete’s explosive leg power and muscular strength. In jumping, throwing, track and field, Team events and other activities, the athlete must be able to use strength as quickly and forcefully as possible. This display comes in the form of speed strength or power. Researchers have shown that physical fitness training can improve muscular power. In fact, Physical fitness is a type of training that is used to enhance the ability of muscles to generate power. Physical fitness training exaggerates the (stretch-shortening cycle SSC by using a lengthening movement (eccentric) which is quickly followed by a shortening movement concentric), SSC using activities such as jumping, hopping, and bounding. Physical fitness training has been shown to improve jumping ability and other high power movements. This suggests that physical fitness training improves the ability of muscles to return elastic energy during the SSC.

Numbers of studies have shown the positive influence of aerobic physical activities on fitness and body composition. Further, breathing pattern can impact on performance in sports person; therefore, athletes need to develop correct breathing practices and this can be achieved through yogic breathing (Pranayama). Further, it has been perceived that deep breathing decreases performance anxiety and improves concentration. The correct breathing techniques are presented in yogic texts and can benefit athletes in improving their skills. Moreover, the yoga postures are designed to build core strength. The slow, focused movements and the muscular stretches of many poses will add a new form of resistance training to the exercises. Yoga practices help to enhance flexibility, and range of motion and at the same time they relieve muscle tension. Additionally, balancing postures which are frequently missed out by sportsmen, though, they are among the most efficient ways to rectify any discrepancy in the body. Nevertheless, Yoga is the ideal way to bring balance exercises into training regimen and might be helpful to fix these imbalances. Further, appending new exercises to regimen will help bring down chances of injury and reduce training boredom. It will

also add variety and help to recover from tough aerobic or strength workouts.

Many research studies have shown beneficial effects of yoga practices in improving physical fitness and motor abilities in varied population. However, very few studies are conducted so far to explore the combined effects of exercise and yoga in sports performance. Hence, the researcher has planned this study to see the effect of conventional exercise training followed by yoga practices among hockey players.

CONCLUSION

In case of enhancing components of physical fitness and anaerobic capacity of the hockey players, physical exercises training have been recommended. Further, yoga training has been recommended for improving flexibility and breath holding time of hockey players. The combined training "yoga + physical exercise" is recommended for improving overall fitness levels of hockey players. The aerobic system is therefore highly demanded and a good aerobic strength is required to resist repeated episodes of high intensity training. Elite hockey players have high anaerobic power and anaerobic resistance. While the majority of the game is played in low-level activities like walking and sports, repeated sprints are a major player feature of speed and lactic acid tolerance. 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.

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