Effects of Selected Exercises in Yoga on Motor Fitness and Football

Skills of Boys Aged 14 to 16 Years

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INTRODUCTION

Modern life has removed man from nature’s benign and rhythmic influence. The internal rhythms the inherent clock-work-like nature of the nervous and endocrine systems have become imbalanced through the effect of stress and tension resulting in feeling of discomfort and lack of well-being and leading to diseases.

At the beginning of the twentieth century hardly a small percentage of the population were doing activity and exercise for the development of functional fitness. Global warming and pollution cause hypo kinetic diseases and diseases related to bones. If functional fitness would be well maintained then we can say good bye to various diseases. This also indicates that individuals can experience health benefits while changing from a sedentary lifestyle to an active lifestyle. It is important to identify any physical limitations, cardio-respiratory fitness, muscular strength and endurance, flexibility and so on, that could place them at risk of bodily harm.

Yogic practices getting popular are looked upon. It’s systematic for the improvement of physical fitness of an individual. Yet we lack in the experimental evidence about the utility of physical exercise and yogic exercises for promoting physical fitness. Despite this fact many people misunderstand yoga even in India. If we were to take a cross-section of society and make a general survey of the public’s opinion about yoga we would find many misconceptions about yoga.

In order to bring yoga to life and to really gain profit by it one must take it to heart in
every sense of word and live it as an essential part of one’s daily life.

We can now summarize the benefits of yoga as follows:

1) Yoga teaches how to develop latent powers both mental and physical.
2) Yoga develops strong will power and through this, control of emotions resistance to the temptations of passion, power and greed, resistance to all unworthy desires.
3) Yoga expands the intellect, develops spiritual consciousness and self-control establishes one in serenity peace and happiness.
4) Yoga promotes long life happiness and unity.

Soccer is perhaps the most demanding of all sports. In the modern game (at any level) soccer, training and conditioning is essential. Few sports are played on a large playing field, lasting as long and without regular rest periods. Players cover 8-12km during a match, consisting of 24% walking, 36% jogging, 20% coursing, 11% sprinting, 7% moving backwards and 2% moving whilst in possession of the ball. Football (also known as association football or soccer) is a team sport played between two teams of 11 players each. It is widely considered to be the most popular sport in the world. Football is a ball game, which is played on a rectangular grass field, or occasionally on artificial turf, with a goal post at each end of the field. The objectives of the players is to score by maneuvering the ball into the opponent goal only the goalkeepers may use their hands or arms to propel the ball in the marked area in general play. The team that scores the most goals by the end of the match wins. If the score is tied at the end of the game, either a draw is declared or the game goes into extended time depending on the format of the competition.

Yoga is a systematic discipline originated in India, for self-realization. However, now a day scientific researchers find its utility for all round development of personality along with innumerable spiritual as well as therapeutically applications. As per Indian tradition Yoga, especially Hathayoga, comprises of different yogic exercises viz., asana (body postures), pranayama (controlled regulation of breath), bandha (physiological locks or holds of the semi-voluntary muscles), kriyas (cleansing process), and mudras (attitude which spontaneously
arouses meditation). Swami Kuvalayananda, the father of scientific research in Yoga and founder of Kaivalyadham (India), has constructed the curriculum of yogic exercises to maintain health and fitness. Yogic exercises are also becoming popular in the area of games and sports and also in the curriculum of Indian schools, colleges and universities.

The *darsanic* (philosophical) and psycho physiological practices of yoga and our established systems of exercise have since long been utilized for preserving, restoring and achieving holistic health. Least energy expenditure as well as minimal space and expenses in carrying them out make yoga practices ideally suitable. *Hatha* Yogic texts viz., *Hathapradipika* and *Geranda Samhita* speak of psychophysical rejuvenation through yoga practices (Digambarji & Gharote, 1982; Digambarji & Jha, 1980). Scientific researchers at Kaivalyadhama Yoga Research Institute, Lonavla amply corroborate these claims in their findings.

Yogic practices are supposed to reduce the high activation level and psycho physiological disequilibrium and also contribute to steadiness, psychomotor coordination and emotional stability. Such condition of high activation level and psycho physiological imbalance along with emotional instability seems to increase various disorganization of motor responses and tremors.

For the purpose of this study significance and justification are as follows:

* It would provide an easy, viable solution to the football community to achieve functional fitness in the Mumbai which would be able to evaluate or assess’s difference in their daily activity.

* The football players could be more energetic and this would catalyze changes in their lifestyle.

* Mental peace and psychological relaxation will be achieved.

* Being drugless and non-costly technique; yogic exercises could be promoted to be used at mass and community levels for the promotion of functional fitness in promoting regular playing performance of football players.
Through this research project, the football playing generation at large would experience a happy playing hours with full energy. Society too would be amply benefited by the immense experience and expertise of the players enhancing further their self-worth and self esteem, which in turn would make their twilight years happy.
LITERATURE REVIEW

Bera and Rajapurkar\(^1\) studied 40 male high school students participated for a study in relation to body composition cardiovascular endurance and anaerobic process. The result of ANCOVA revealed that significant improvement in ideal body weight, body density, cardiovascular endurance and anaerobic power was observed as a result of yoga training. This study does not show the significant diameter and most of the body circumferences. It was evident that some of the fat folders (Triceps, sub scapular suprailiac, and calf) and body circumferences (waist, unibilical and hip) were reduced.

Joglekar\(^2\) studied skills in badminton and associated fitness abilities of sixty female students, age 18-20 years, from Mumbai. Selected yogic practices were the training intervention for 6 weeks. This was a controlled study. Result revealed that yoga played an efficient role for improving not only the skills of badminton, but the level of physical fitness too.

Carling C and DuPont G,\(^3\) conducted the study to determine whether declines in physical performance in a professional soccer team during match-play were associated with reductions in skill-related performance. Neither physical nor skill-related performance was affected across three consecutive games within a period of ≤7 days. The results suggest that the players were generally able to maintain skill-related performance throughout games and when competing in successive matches within a short time.


Castagna C, et al.\textsuperscript{4} conducted this study to examine the relationship between popular endurance field tests and physical match performance in elite male youth soccer players. Players were observed during international championship games of the corresponding age categories and randomly submitted to the level 1 of the Yo-Yo intermittent recovery test (Yo-Yo IR1), the Multistage Fitness Test (MSFT), and the Hoff test on separate occasions. Players' Yo-Yo IR1 and MSFT performance were significantly related ($r = 0.62-0.76$) to a number of match physical activities. However, the Hoff test was only significantly related with sprint distance ($r = 0.70$, $p = 0.04$). The Yo-Yo IR1 showed a very large association with MSFT performance ($r = 0.89$, $p < 0.0001$). The results of this study showed that the Yo-Yo IR1 and MSFT may be regarded as valuable tests to assess match fitness and subsequently guide training prescription in youth soccer players.

Molacek Z D, et al.\textsuperscript{5} conducted the study with the purpose to determine the effects of acute low- and high-volume static and proprioceptive neuromuscular facilitation (PNF) stretching on 1-repetition maximum (1RM) bench press. Two and 5 sets of stretching were completed for the low- and high-volume protocols, respectively. There were no significant differences in 1RM bench press performance ($p > 0.05$) among any of the stretching protocols NS (129.7 +/- 3.3 kg), LVPNFS (128.9 +/- 3.8 kg), HVPNFS (128.3 +/- 3.7 kg), LVSS (129.7 +/- 3.7 kg), and HVSS (128.2 +/- 3.7 kg). We conclude that low- and high-volume PNF and static stretching have no significant acute effect on 1RM bench press in resistance-trained collegiate football players.


Harrison A J and Bourke G⁶ conducted study with the purpose to investigate whether an RS (Resisted Sprint) training intervention would enhance the running speed and dynamic strength measures in male rugby players. The RS group performed two sessions per week of RS training for 6 weeks.

The results show a statistically significant decrease in time to 5 m for the 30-m sprint for the RS group \((p = 0.02)\). The squat jump and drop jump variables also showed significant increases in starting strength \((p = 0.004)\) and height jumped \((p = 0.018)\) for the RS group. The results suggest that it may be beneficial to employ RS training.

B K Acharya, et. al⁷ conducted study on twenty male junior footballers. The subjects were asked to follow their routine diet and exercise pattern during the period of study. None of the subjects were exposed to yogic practices before this yoga training session. There was a significant reduction in the levels of serum cholesterol, Low-density lipoprotein (LDL) cholesterol, serum triglycerides, and very-low-density lipoprotein (VLDL)-cholesterol at the end of the yoga session. The results indicated that the fasting blood sugar (FBS) level was positively elevated in junior footballers. This demonstrated that Pranayama and Yogasana were helpful in regulating sugar level.

B. Donohue, et. al.⁸ conducted study to examine the efficacy of two preparatory interventions on one mile run performance in 90 high school long distance runners. After participants had completed a one mile baseline run, they were randomly assigned to participate in either one of two interventions (brief yoga exercises, motivational shouting exercises) or a no intervention control condition.

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Although the magnitude of the effect was small participants assigned to yoga exercises showed significant improvements in running performance relative to control condition participants. Consumer satisfaction ratings indicated that participants who were assigned to the motivational and yoga exercise groups liked their interventions more than those assigned to the control group. Motivational and yoga interventions designed to improve long distance running performance were equally acceptable to the participants, but the former had a greater effect.

R.K Bhatia and Premlata ⁹ “Effect of Selected Yogic Exercises on Balance and Perception of College Level Players”. The major responses to make our posture and balance excellent examples on movements based on integrated sensory information. Both vision and kinesthetic provide information for balancing but during infancy and early childhood we sometimes rely more on visual information and kinesthetic information. Performance on various balance tasks improve throughout childhood and adolescence although the timing of these improvement depends on the type static or dynamic and the nature of the task.

Keeping this in view the investigators have made an experimental study on the balance and perception of female players to find out the effect of yogic exercises on balance and perception this experiment was made on forty female players of college level. For this players were selected as subjects from University College of Kurukshetra University. The sample was further divided into two groups A and B. The test of balance (Static and Dynamic) and perception were taken as criterion measure. Gr. A was given a programme of selected Yogic Asanas for a period of six weeks while Gr. B was kept controlled. The analysis of data showed that yogic exercises were found effective to develop perception and balance.

Ozgunen K T et.al\textsuperscript{10} found in their study that heat stress may contribute to decreased match performance when football is played in extreme heat. This study evaluated activity patterns and thermal responses of players during soccer matches played in different environmental conditions. Non-acclimatized soccer players (n=11, 20±2 years) played two matches in conditions of moderate heat (MH) and high heat (HH) index. Core temperature (T(c)) and physical performance were measured using a telemetric sensor and a global positioning system, respectively. The average ambient temperature and relative humidity were MH 34±1 °C and 38±2%; HH 36±0 °C and 61±1%. Peak T(c) in the MH match was 39.1±0.4 °C and in the HH match it was 39.6±0.3 °C. The total distance covered in the first and second halves were 4386±367 and 4227±292 m for the MH match and 4301±487 and 3761±358 m for the HH match. Players covered more distance (P<0.001) in the first half of the HH match than in the second half. In football matches played at high environmental temperature and humidity the physical performance of the players may decrease due to high thermal stress.

Bandelow S, et.al.\textsuperscript{11} investigated the cognitive effects of exercising in the heat on the field players of two football teams in a series of three matches. Different rehydration and cooling strategies were used for one of the teams during the last two games. Cognitive functions were measured before during and immediately after each football match as well as core temperature, body mass, plasma osmolality and glucose levels allowing an estimate of their differential impacts on cognition. The pattern of results suggests that mild-moderate dehydration during exercise in the heat (up to 2.5%) has no clear effect on cognitive function. Instead, plasma glucose and core temperature changes appear to be the main determinants


higher glucose was related to faster and less accurate performance whereas core temperature rises had the opposite effect. The 50% correlation between plasma glucose and core temperatures observed during exercise in the heat may help to stabilize cognitive performance via their opposing effects. The glucose-like effects of sports drinks appear to be mediated by increased plasma glucose levels, because drinks effects became non-significant when plasma glucose levels were added to the models. The cooling intervention had only a beneficial effect on complex visuo-motor speed.

Wood G. and Wilson M.R.\textsuperscript{12} Studied while facing penalty kicks in football (soccer) goalkeepers frequently incorporate strategies that are designed to distract the kicker. However no direct empirical evidence exists to ascertain what effect such visual distractions have on the attention control, and performance of footballers. Eighteen experienced footballers took five penalty kicks under counterbalanced conditions of threat (low vs. high) and goalkeeper movement (stationary vs. waving arms) while wearing eye-tracking equipment. Results suggested that participants were more distracted by a moving goalkeeper than a stationary one and struggled to disengage from a moving goalkeeper under situations of high threat. Significantly, more penalties were saved on trials when the goalkeeper was moving and shots were also generally hit closer to the goalkeeper (centrally) on these trials. The results provide partial support for the predictions of attention control theory and implications for kickers and goalkeepers are discussed.

Comyns T.M.et. al.\textsuperscript{13} undertook the study to examine the effect of a heavy weight training exercise on sprinting performance and on the effect of repeated exposure to a complex training protocol. Eleven male rugby union players (age 20.9 +/- 3.1 years) participated in the


study, which involved 5 separate testing sessions. Back squat 3 repetition maximum (3RM) was established in session 1. Sessions 2-5 were identical and involved the subjects completing a 30-m sprint before and after a 3RM back squat protocol. Four minutes of rest was given between the back squatting and the posttest 30-m sprint. All sprint trials were measured with a laser measurement device (LAVEG, Jenoptik and Jena, Germany). Sprint time and instantaneous, average and maximum velocity were the dependent variables. The criterion for significance was set at an alpha level of \( p > 0.05 \). No significant improvement was evident for any of the testing sessions \( (p > 0.05) \). In session 1 there was a significant increase in 30-m time and a significant reduction in average 30-m velocity and maximum velocity \( (p < 0.05) \). The expected benefits in sprinting may not have been realized because of intra and inter subject variations in sprint technique. The session x phase interaction revealed a significant improvement in the pre to posttest changes in instantaneous velocity at 20 m \( (p = 0.035) \) and 30 m \( (p = 0.036) \) from session 1 to session 4. This indicates that the rugby players.

Brechue W.F and Mayhew J L\textsuperscript{14} conducted study to assess changes in upper-body muscular strength and work capacity following off-season resistance training and the resultant effect on prediction of muscular strength (1 repetition maximum or 1RM). National Collegiate Athletic Association (NCAA) Division II football players \( (n = 58) \) were divided into low-strength (LS, 1RM <275 lb, \( n = 23 \)) and high-strength (HS, 1RM \( > 275 \) lb, \( n = 35 \)) groups based on initial 1RM bench press. Maximal repetitions to failure (RTF) were performed with a relative \( (60, 70, 80, \) and 90\% of 1RM) and absolute load \( (185 \text{ lb for players with 1RM <275 lb, 225 lb for players with 1RM \( > =275 \) lb}) \) at pre- and post-training. Following training \( (n = 58) \), there was a significant increase in 1RM bench press \( (22.8 +/- 12.0 \text{ lb}) \) and body mass \( (3.7 +/- 10 \text{ lb}) \). There was no change in the number of repetitions performed (RTF) during relative load testing

\textsuperscript{14}Brechue W.F and Mayhew J L. Upper-body work capacity and 1RM prediction are unaltered by increasing muscular strength in college football players. \textit{Journal of Strength and Conditioning Research}. 2009; 23(9): Pp 2477-86.
following training. However RTF during absolute load testing was increased. Relative and absolute load work capacity (reps x load) increased with training but there was no relationship between the change in work capacity and the changes in muscular strength. Predicted 1RM was better at lower repetitions (3-5 RM, >85% 1RM) than at higher repetitions (>6RM, < or =80% 1RM) at both pre-and post-training. In conclusion changes in muscular strength associated with the off-season training program used herein appear to have little effect on work capacity or prediction of 1RM using sub maximal loads. For repetition predictions to accurately track changes following resistance training, the test load must be relatively high (>85% 1RM) and the repetitions low (< or =5 reps).

McBride J M, et. Al\textsuperscript{15}. With the purpose of investigation to examine the relationship between maximal squat strength and sprinting times. Seventeen Division I-AA male football athletes (height = 1.78 +/- 0.04 m, body mass [BM] = 85.9 +/- 8.8 kg, body mass index [BMI] = 27.0 +/- 2.6 kg/m2, 1 repetition maximum [1RM] = 166.5 +/- 34.1 kg, 1RM/BM = 1.94 +/- 0.33) participated in this investigation. Height, weight and squat strength (1RM) were assessed on day 1. Within 1 week, 5, 10, and 40 yard sprint times were assessed. Squats were performed to a 70 degree knee angle and values expressed relative to each subject's BM. Sprints were performed on a standard outdoor track surface with timing gates placed at the previously mentioned distances. Statistically significant (p < or = 0.05) correlations were found between squat 1RM/BM and 40 yard sprint times (r = -0.605, p = 0.010, power = 0.747) and 10 yard sprint times (r =-0.544, p = 0.024, power = 0.626). The correlation approached significance between 5 yard sprint times and 1RM/BM (r = -0.4502, p = 0.0698, power = 0.4421). Subjects were then divided into those above 1RM/BM of 2.10 and below 1RM/BM of 1.90. Subjects with a 1RM/BM above 2.10 had statistically significantly lower sprint times at 10 and 40 yards in comparison with those subjects with a 1RM/BM ratio below 1.90. This investigation provides

additional evidence of the possible importance of maximal squat strength relative to BM concerning sprinting capabilities in competitive athletes.

Perez-Gomez J, et. al\(^{16}\) studied the effects of a training programme consisting of weight lifting combined with polymeric exercises on kicking performance myosin heavy-chain composition (vastus lateralis), physical fitness and body composition using dual-energy X-ray absorptiometry (DXA) was examined in 37 male physical education students divided randomly into a training group (TG: 16 subjects) and a control group (CG: 21 subjects). The TG followed 6 weeks of combined weight lifting and polymeric exercises. In all subjects tests were performed to measure their maximal angular speed of the knee during in-step kicks on a stationary ball. Additional tests for muscle power (vertical jump), running speed (30 m running test), anaerobic capacity (Wingate and 300 m running tests) and aerobic power (20 m shuttle run tests) were also performed. Training resulted in muscle hypertrophy (+4.3%), increased peak angular velocity of the knee during kicking (+13.6%) increased percentage of myosin heavy-chain (MHC) type IIa (+8.4%), increased 1 repetition maximum (1 RM) of inclined leg press (ILP) (+61.4%), leg extension (LE) (+20.2%), leg curl (+15.9%) and half squat (HQ) (+45.1%) and enhanced performance in vertical jump (all p < or = 0.05). In contrast MHC type I was reduced (-5.2%, p < or = 0.05) after training. In the control group, these variables remained unchanged. In conclusion 6 weeks of strength training combining weight lifting and polymeric exercises results in significant improvement of kicking performance as well as other physical capacities related to success in football (soccer).

Sidiropoulou M P, et al\(^{17}\) placed emphasis in screening individuals with exercise-induced bronchospasm in order to avoid persistence bronchial hyperactivity and consequent

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chronic silent inflammation of the respiratory tract. The purpose of this study was to evaluate the effect of interval training on the respiratory function and endurance in children with exercise-induced asthma (EIA) participating in the sport of soccer.

Twenty-nine boys ages 10-14 who developed EIA after a 6-minute free running test (decline in forced expiratory volume in 1 second: FEV (1)10%) participated in the study. They were divided into 2 groups (experimental N = 18 and control N = 11) fulfilling the same criteria (i.e. age, body height, weight and severity of asthma). The experimental group exercised with the interval training method for a period of 8 weeks (3 sessions per week) whereas the control group exercised with the usual football programme. Measurements were made for FEV (1) and endurance in both groups before and after the application of training (8 weeks). Following the implementation of the training programme a significant improvement in FEV (1) and endurance was documented. The experimental group as well as significant differences between the 2 groups. In conclusion duration and aerobic training via the interval method seems to be beneficial to soccer players with EIA.
OBJECTIVES

The present study aims to evaluate the impact of yogic exercise modules on motor fitness and playing skills of football players in Mumbai with the purpose:

1) To evaluate the playing ability of football players with respect to the daily activities with a set of yogic exercises.

2) To design yogic exercise modules for improving motor fitness.

3) To measure motor fitness of football players with respect to flexibility, strength, and agility.

4) To evaluate efficiency of the module on selected Motor fitness factors through a controlled experiment.

HYPOTHESES

On the basis of the literature available so far, it is hypothesized that:

H1: There would be significant difference in improving functional fitness through, selected yogic Exercise Module.

H2: There would be significant difference in improving football playing skill through yogic Exercise Module.
METHODOLOGY

1. Sample

Sixty (N=60) Football playing male subjects, age group ranging from 14 to 16 years, will be pooled randomly as sample. The criteria for inclusion and exclusion of the subjects will be as follows:

- The players who are the regular practitioners of Football will be included in the experiment.
- The subjects who are expected to remain present till the experimental trials are finished will be incorporated in this study.
- The subjects irrespective any community, willing to participate in this study, will be incorporated.
- The players suffering from known serious health problems are to be excluded. Moreover, players having incapacitating physical illness as ruled out by clinical investigation will be excluded prior to the study.

Ethical Consideration

Informed consent of all the participants and their guardians prior to the experiment will be taken with standard format (World Medical Association’s Declaration of Helsinki). As the
study considers the philosophy of Yoga researcher is aware of the religious factors of the participants and accordingly the arrangement will be done.

2. Experimental Design

The subjects will be divided into two equal group’s viz., Gr. A and Gr. B. Group-A will participate in the “Yoga Exercise Schedule” and Group-B will be acted as “Control Group.” There will be daily 45 minutes practice considering the above schedules except Sundays and holidays. During daily experimental period while all the subjects of selected groups will be involved with their respective training schedules, the subjects of control group will be kept busy with some recreational activities in Physical Education. Moreover, after completion of daily training schedule for 45 minutes there will be a regular practice of Football game for 30 minutes. All the experimental as well as control groups will combine participate in the same. The total duration of the experimentation will be at least for three months (including testing dates, Sundays and holidays) which include the one experiment, one follow-up programmes to record the long term effects of the experiment and one detraining programme of 6 weeks each.

This is a randomized block design (Hubbard, 1973) which consists of the following steps:
Step-I (Pretest)

Selected Football skills of all the subjects belonging to control and experimental groups will be tested prior to the experiment by using standard tests of Football (Campbell & Tucker, 1967). Some selected Motor fitness components as required by the Football players will also be assessed by implementing standard tests (Frost & Cureton, 1977). The scores of skills and fitness components will be recorded carefully.

Step-II (Training / Treatment)

After pre-testing, the subjects of experimental groups will receive their respective training, as stated above, for 45 minutes daily which will be followed by a game practice in Football for 30 minutes. The subjects of the control group will be kept busy with recreational activities considering the principle of physical education for first 30 minutes and they will also participate in the game practice in Football for last 30 minutes daily. Thus all the subjects will be involved for a period of 1 hr. and 15 minutes daily except Sundays and holidays. The duration of this experimentation will be for at least 12 weeks.

Step-III (1st Post Test)

After completion of the 6 weeks of experiment, as stated above, all the subjects of both the control and experimental groups will be directed for 1st post-testing. Here the testing procedures will be same as mentioned in the pre-test.
Step-IV (1st Follow-Up Programme & 2nd Post Test)

First Follow-Up (F.U.) programm will start for another 6 weeks after completion of 1st post testing (Step-III). In this program, the subjects of all the groups (both control and experimental) will practice regularly 1 hr.day\(^{-1}\) except Sundays and holidays what they already learnt in Step-II under the passive involvement of the teacher. After completion of the 1st follow-up programme of 6 weeks, all the subjects of both the control and experimental group will be instructed for 2nd Post Test. Here the testing procedures will be same as mentioned in the pre-test.

3. Variables to be tested

- Shooting Skills in Football (Campbell & Tucker, 1967).
- Motor Fitness variables as required by Football players (Frost & Cureton, 1977).

4. Tackling of Possible Problems during Experiment

a) Problems about assigning equated groups for experiment may appear due to Randomization. Such problems may be tackled considering the age group and using the analysis of preliminary report of anthropometric, fitness and skill measurements. In fact, the baseline characteristics of different experimental and control groups can be subjected to statistical analysis for significant difference.
b) Lost to Follow-up/ Drop Outs may create problem leading to insufficient number of data that may spoil the significance and precision of an experimental research. In this case the addresses, telephone numbers etc. of all the participated subjects as well as their close relatives or a friend will be noted in the beginning.

c) It is not possible to tackle both the groups at a time by the researcher alone. Therefore she will appoint professionally qualified experts who have research experience at least at Masters’ Degree level in Physical Education, and they will be trained according to the nature of intervention of stimuli.

REFERENCE


Brechue W.F and Mayhew J L. Upper-body work capacity and 1RM prediction are unaltered by increasing muscular strength in college football players. Journal of Strength and Conditioning Research. 2009; 23(9): Pp 2477-86.