

Chronic Physiological Adaptation of Weight Resistance Training Program on The Mac-Christian Test on The Male Adolescent Football Players

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Abstract – To study the chronic physiological adaptation of weight resistance training program on the Mac-Christian test on the male adolescent football players was analyzed in this study on influence bodyweight resistance training on performance of penalty kick of adolescence boys in football. The study was carried on 40 boys from thane district, Maharashtra. The average age of the boys was 17 years whereas average height 174.75 cm and average weight is 64.36 kgs. Penalty kick performance was evaluated at the beginning and end of the investigation using the Mac-Christen test following standardized procedures. Subjects were partitioned into a control group who received their usual training, and an experimental group who completed body weight resistance training for 12 weeks. training, and an experimental group who completed body weight resistance training for 12 weeks. Data were analyzed using an ANOVA with significance set at the $p < 0.05$ level. The accuracy of the Mac-Christen test was $10.2 \pm$ standard deviation in the control group and $27.00 \pm$ standard deviation, in the experimental group, with a mean difference of 16.8. This reveals that body weight resistance training enhances strength in the lower extremities significantly which may improve penalty kick performance.

I. RATIONALE OF THE STUDY

The world's most popular game is football, with avid fan following players, clubs, trophies and championships important consideration for playing these sports includes skill, tactics and techniques used by player during game situation. Successful teams employ all these factors as a cohesive unit, where every member of the team contributes equally. The dynamics of the game is constantly evolving, and players are equipped with advance skills that include shooting, kicking, power shot, flip, short slice, chip, and penalty kick.

Penalty shots decide the fate of many games. This brief interaction challenges both the physical as well as mental skills of the football player. It requires skill, passion, concentration and executing while under pressure. Penalty shots are situations where the player or goalkeeper wins when either conquers fear and exerting pressure of delivering performance. Success with a penalty shot involves not just the skill of putting the ball into the net, but the ability to place it out of the reach of the goalkeeper. Football is a game of muscular strength, endurance, speed, and agility. (Luc Arrondel, 18-10-2018)

Weight training is a scientific and systematic process to develop the muscular strength and muscular power. (Timothy J. Suchomel, 2018) Weight training enhances the functional and structural ability of big muscles and performance. (Samuel T Orangea, 2020). Research indicated that the greatest strength increases result from weight training program that requires the completion of various exercises that challenges the capacity of muscles through movement. Berger suggested that six to eight repetitions are most effective for structural and functional growth of muscles. (Carpinelli, 1962) Weight training has become an integral part of football training program both, in season and off season. The beneficial effect of weight training for soccer skills has been studied in various research. Throughout the world, many developing football players do not have access to resistance training equipment used by the top soccer clubs. The only available recourse is to utilize one's own body mass as the resistance (body weight resistance). Thus, there is a need to examine whether body weight resistance is effective, however, it is unknown whether this type of program would result in

football-specific performance enhancement in a cohort of adolescent males. Therefore, the objective of the study was to determine potential increases in lower body muscular strength and the accuracy of kick in penalty shot in adolescence football players following a body-weight resistance training program. It was hypothesized that there is a significant change in lower extremity muscular strength would result in penalty shot accuracy.

II. METHODOLOGY

Adolescent male football players from Shrimati Sulochanadevi Singhania School, thane West, Maharashtra India were recruited for the investigation (Experimental Group-20 and Control group-20). An appropriate sample size was estimated using G*Power software (version 3.1.9.7; Universität Kiel, Dusseldorf, Germany), with an effect size of (0.63) and a power of (0.80). (Fayazmilani R, Feb.2022) The average age was 17 years, height = 174.75cm, and body mass =64.36 kg. The study was approved as a thesis by the faculty of the University of Mumbai, and all participants provided informed consent.

Protocol:

The study consisted of one experimental group which was compared with an equivalent parallel design for testing the effect of weight-training program for the development of muscular strength and performance of adolescent football players over 12 weeks.

Table 1. Exercises, volume, and duration of the body-weight resistance training program utilized.

Exercise	Sets X Reps	Duration
Squats	3 X 12	1st to 4 th week
Lunges	3 X 12	1st to 4 th week
Dead lift	4 X 12	5 th to 8 th week
Weighted Box Stepping	4 X 12	5 th to 8 th week
Jump squat	5 X 12	9 th to 12 th week
Straight back dead lift	5 X 12	9 th to 12 th week

Table 2. Training intensity and prescription of the body-weight resistance training program that was employed.

PHASES	GUIDLINES
LOAD	MODERATE-HIGH
INTENSITY	PROGRESSIVE
NO. EXERCISES	3-6
NO. REPS PER SET	8-12
NO. SETS PER EXER.	3-5
REST INTERVAL	60 SECONDS
SPEED OF EXECUTION (Parrott, 2019)	1-2 secs in concentric 3-4 secs in eccentric
FREQUENCY	THRICE A WEEK

Post Test Phase: -

After the 12-week body-weight resistance training program, posttest measurements were obtained. Testing was conducted as described in the pretest.

Analysis of Data:

The data was analysed by using ANOVA at the significance level of p<0.05.

Table: -1 Comparison of Mean gain of muscular strength of Experimental and control group

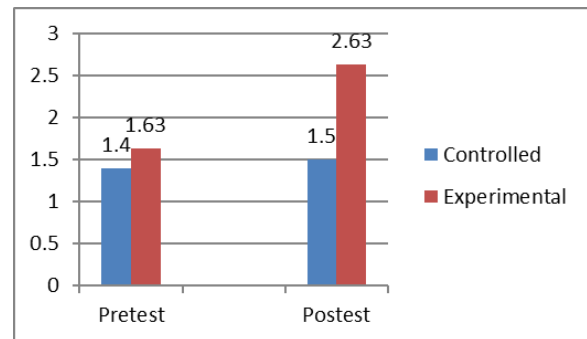


Fig: -1 Mean gain of muscular strength of Experimental and control group

Table: -2 Comparison of Mean gain of Mac-Christian test of Experimental and control group

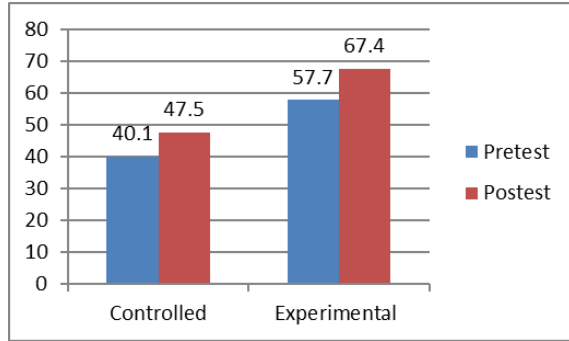


Fig:-2 Mean gain of Mac-Christian test of Experimental and control group

From the above graphical representation, the researcher has analysed and interpreted that weight training improves muscular strength of lower extremities which is tested by using standing broad jump. There is a significant improvement in accuracy of penalty kick skills due to weight training. Weight training brings strength and stability in the muscles which results in enhances performance. Mac-Christian test of goal shooting accuracy improves penalty kicking skills significantly due to weight training program

III. RESULTS AND DISCUSSIONS

From the graphical representation, the researcher has analysed and interpreted that weight training improves muscular strength of lower extremities which is tested by using standing broad jump. There is a significant improvement in accuracy of penalty kick skills due to weight training. Weight training brings strength and stability in the muscles which results in enhances performance. Mac-Christian test of goal shooting accuracy improves penalty kicking skills significantly due to weight training program

IV. SUGGESTIONS AND RECOMMENDATIONS

From the results of the study can be concluded that, selected weight training for 12 weeks could help to improve muscular strength of lower extremities and accuracy in penalty shooting of adolescence boy’s football players, further recommended that present

study can be used by the sports coaches and physical education teachers for training and assisting in performance enhancement of football teams on various levels.

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