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CALISTHENICS TRAINING: EFFECTS ON PHYSICAL FITNESS (COORDINATION, FLEXIBILITY AND ENDURANCE) OF KABADDI PLAYERS

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ABSTRACT:
Thepurpose of the present study was to determine the impact of calisthenics training and physical fitness variables on overall playing ability level of male Kabaddi players of Pakistan. Study was aimed at to find out the effects of calisthenics training on physical fitness (coordination, flexibility and endurance) and playing skills level of kabaddi players. Study was conducted in seven districts of Punjab, Pakistan including Faisalabad, Sahiwal, Bahawalpur, Lahore, Gujrat, Gujranwala and Toba Tek Singh. Non-probability and random sampling techniques were applied in districts selection and players selection respectively.To achieve the purpose of this study seventy male kabaddi players ten from each district were selected for study. The age of players varied between 18 to 28 years.All the subjects were tested on selected variables, before and after the treatment. Pre- and post-training data was collected by the researcher on field during competitions and training from the respondents. Training session of players consisted of 30 to 40 minutes training twice a day for four weeks consecutively. After four weeks number of sessions were increased to four from two and four week were reduced to two, with intensive training schedule. Calisthenic exercises training schedule improved the coordination of the lower extremities, range of movement of joints, muscular endurance and agility.Findings have shown that instructional training and traditional training group significantly improved the physical fitness variables such as;agility, leg explosive power, muscular strength endurance and overall playing ability of Kabaddi players of Pakistan. Results of the study favored the objectives of the study but did not support both the hypothesis and thus both were rejected.

INTRODUCTION:
Kabaddi is a contact team sport which is originated froman Indian city Tamil Nadu subcontinent. It is one of the popular games in South Asia and is the state game of the Indian states of TamilNadu, Maharashtra, Bihar, Andhra Pradesh, Telangana and other most of districts of Punjab. Kabaddi is thenational sport of Bangladesh (Sharma HB, Kailashiya J., 2017). Two teams compete, each with occupying its own half of the court.Turn by turn they take their number by sending a "raider" into the opposing team's half and earn points if the raider manages to touch opposing team members and return to their home half, all while with asingle breath.If, however the raider is tackled and prevented from returning, point is awarded to the opposing team (Negra Y, et al, 2017).It is a team contact sport demanding high levels of endurance, explosive power, strength, agility, reaction time, spatial awareness, as well as speed. Plyometric and calisthenic exercises are essential for improvement of explosive power, agility, aerobic capacity, trunk and lower-extremity muscle strength/power, and flexibility (Miller MG, et al., 2006). The present study hypothesized that plyometric and calisthenics training integrated with conventional Kabaddi training would enhance explosive power, agility, trunk/lower-extremity strength, balance, and aerobic performance among male Kabaddi players of Punjab, Pakistan.

Physical activity is a necessary component of human health and life. Every individual need at least some exercises daily to maintain a well-functioning body and mind. Exercises promote strong muscles and bone structure towards a healthy heart and lungs, leading towards good health and wellbeing. For professional athletes, physical activity remains not only just staying healthy; it ensures peak performance and optimal results in competitions. Whether you are performing on a professional level or just participating to maintain fitness, measuring the actual effects of activity on body is vital and is tremendously useful for understanding fitness levels of sportsmen and individuals. The response of athlete to both everyday activity and physical exercise has been considered important by researchers. Results of studies and thus such

informationmay prove a great motivation for beginners andothers just interested in exercise and fitness activities. For athletes, reports can be used to prefer focused training sessions forachievement of specific goals (Davies G, etal., 2015).

It's well known that a lack of exercise contributes to injury, illness and disease. A fit and active body is better able to protect itself against attack. For athletes, the opposite is true in that overtraining can lead to fatigue-related injuries and illnesses. Finding the right balance can be difficult without the proper tools.Athlete makes his health and fitness levels transparent and easy to be understood. The science behind fit and efficient athlete is the result of decades of research and planning in the field. Safe, effective pace of training and exercisesmay affect physical activity.Exercise protocol consisted of bench press, shoulder press, hip flexion, knee extension, pull-up, arm-curl, and lat-pull down, leg press, arm dips, incline sit-ups, and all calisthenics conditioning exercises. Therewas significant difference in training routines when considering that the calisthenics group was performing five exercises and the weight training group was performing fifteen (Devaraju K, Kalidasan R., 2012).

Training at an elite level requires a sophisticated understanding of physical fitness in order to achieve the best possible results. Training effect report provides insight into the actual effects of training on kabaddi players.Whether training for a solo sport such as weight lifting or a team sport such as soccer, individualized workouts are required to address personal capabilities and current physical state of the participants. Different training techniques and exercises produce different results with goal-oriented regimens.

Players and coaches pick benefit from the customized research reports, tracking and progress monitoring which may lead towards fitness development, workload and training efficacy. No two bodies are alike and, as such, as well as no two training programs should be either.Training effect report has been proven ideal for professional athletes, particularly in those events which require endurance sports such as soccer, football, kabaddi and bodybuilding. Report depicts invaluable insight into the effects of exercise on cardio respiratory and general fitness of players.Resistance training is a basic form of physical activity because it develops several neuromuscular and musculoskeletal characteristics: muscular power, muscular endurance, and muscular strength (Asadi A, et al., 2016). Regular exercise is essential to maintain and improve physical fitness of athletes. When athletes push their bodies to adapt and excel, they opt for better shape and improve aerobic performance levels, however, it is established fact that it is difficult to understand the exact impact of exercise one's body.Training effect allows to measure and view the actual effects of workouts on players body and fitness levels. Repeated physical activity causes an increase in performance capacity of participants, this physiological response is called Training Effect (TE).Measuring and making sense of Training Effect is the key to training effectively and achieving optimal results before, during and after sport competitions.In order to improve one of these characteristics, and continue exercise progression, the demands of the exercise must be increased. To achieve exercise progression, a trainer manipulates resistance training variables; among these variables are the external resistance used, number of sets and frequency per exercise, rest interval length, and frequency of the activity (Bishop DC, et al., 2009). There are many different methods of resistance training like traditional free weights and dumbbells are the most common, but weight machines, calisthenics (bodyweight), elastic tubing, and medicine balls are also tools that can be utilized in an effective resistance training program. The choice of which resistance training method used will vary between individuals due to current level of fitness, familiarization with exercises, and individual goals and preferences. It is notable

that the manipulation of the resistance training variables mentioned above can stress the muscles in many various ways. The level of effort an individual gives and specific structure of the preparation factors will ultimately figure out which trainable characteristic will be accomplished (Baltaci G, et al., 2003). The most effective technique to achieve long-term progression in resistance training is through the organized manipulation of volume and intensity (Park GD, Lee JC, Lee J., 2014).Maximum muscular power is seen when a specific amount of work is completed in a faster duration of time, or when a maximum amount of work is completed in the same amount of time (Chaouachi M, etal., 2017). Total-body exercises, such as the power clean and push press, are highly encouraged due to their rapid force production and efficiency for enhancing power (Hashim A, et al., 2016).Multiple-set training, three to five, integrated into a strength training program is recommended to improve power (Mayorga-Vega D, et al., 2015). In order to maintain form and the prescribed number of repetitions, longer rest is needed, rest intervals of two to five minutes are the current recommendation (Rahimi R,& Behpur N., 2005). If less than or equal to six repetitions is the goal when training for improvements in muscular strength, above study has shown that loads corresponding to eight to twelve repeated measureshave resulted in significant strength increases in novice lifters (Durlak J., 2009). The weight training group used weights which were allowed for 10-12 repetitions per set, increasing the resistance by approximately 20% when subjects could perform more than the desired number of repetitions, 12, for three consecutive sets and body weight training group. Addition to repetitions of their exercises was made in order to increase training intensity, once repetitions reach numbers greater than the strength training stimulus, muscular strength improvements was no longer the training variable being impacted.In the past, the effect of a workout was measured by collecting and comparing results over a long period of time.

Recently, sport has become more sophisticated and same is the case with evaluation fitness of players. Athlete training effect pave way for collection of physiological data to expresses the efficiency level of participants. Athletes, coaches and general public can interpret the effects of a workout on cardio-respiratory fitness and increase or decrease workload accordingly on their performance and output (Bianco A, et al., 2015).

OBJECTIVES OF THE STUDY:

1. To find out the effects of calisthenics training on physical fitness and playing skills of kabaddi players in Pakistan.
2. To check the effects of bodyweight trainingon coordination, flexibilityand endurance abilitiesof kabaddi players of Pakistan.

HYPOTHESES:

Ho1- There are no significant effects of calisthenics training on physical fitness and playing skills of kabaddi players in Pakistan.

Ho2- There are no significant effects of bodyweight training on coordination, flexibility and endurance abilitiesof kabaddi players of Pakistan.

METHODOLOGY:

To achieve the purpose of this study it was conducted in seven districts of Punjab, Pakistan including Faisalabad, Sahiwal, Bahawalpur, Lahore, Gujrat, Gujranwala and Toba Tek Singh.

Non-probability and random sampling techniques were applied in districts selection and players respectively.Seventy male kabaddi players ten from each district were selected for study. The age of players varied between 18 to 28 years.Pre- and post-training data was collected by the researcher on field during competitions and training from the respondents. Training session of players consisted of 30 to 40 minutes training twice a day for four weeks consecutively. After four weeks number of sessions were increased to four from two and four week were reduced to two, with intensive training schedule. Most of trainingexercises includedskip jumping, sideward running backward running, zigzag running, push & pull ups, closing & opening of fists with straight arms, squads, sit ups and abdominal curls for specified period.

Plyometric and calisthenics training improved sports-specific physical fitness in male Kabaddi players with enhancement and improvement in explosive power, flexibility, agility, and trunk-lower extremity muscle strength. All these have a positive impact on raiding and defense performance of kabaddi players. Hence, it is recommended that plyometricand calisthenics training be integrated with conventional training to enhance the performance of Kabaddi players of Pakistan.

Detail and Duration of Exercises

Schedule	Exercise	Repetition	Duration
Warm Up	**Running like Jogging**	Continue	5 min
	Dynamic Stretching	Continue	3 min
Activity	**Zigzag Running**	Continue	1 min
	Sideward Running	Continue	2 min
	Backward Running	Continue	30 sec
	Squat Position	Continue	1 min
	Hand standing	Continue	1 min
	Push Ups	30	1 min
	Jumping jacks	50	1 min
	Squat Thrust	20	1 min
	Pull Ups	10	1 min
	Sit Ups	30	1 min
	Abdominal Curls	30	1 min
	Forward planks	Continue	1 min
	Sideward Planks	Continue	30 Sec
	Balance exercise	Continue	30 Sec
	Standing long jump	3	2 min
Cool Down	**Static Stretching**	Continue	5 min
Exercises were According to Standardized Pattern			

Statistical Analysis:

Researchers collected the desireddata accordingly on 1st day, end of 2nd week, end of 3rd week and at the end of last week. For pre- and post-comparison of results independent sample t-test was used. For within the group longitudinal comparison repeated measure analysis of variance (RM-ANOVA) was used. Results of study are presented in form of mean,standard deviation and p-values.Results have been shown intabular form. Level of significance was adjusted at .05.

RESULTS

Coordination Ability

Attempt	N		Mean	St. Deviation	p-value
Best Attempt	70	**Pre**	28.01	3.53	.000
		Post	33.41	4.10	

Leg and Back Muscles Flexibility

Attempt	N		Mean	St. Deviation	p-value
Best Attempt	70	**Pre**	19.73	1.31	.000
		Post	19.99	1.22	

Muscular Endurance

Exercise	N		Mean	St. Deviation	p-value
Sit–up Test	70	**Pre**	18.66	4.51	.000
		Post	19.92	4.97	
Push–up Test		**Pre**	23.42	3.39	.000
		Post	25.76	3.19	

Cardio-respiratory Endurance

Test	N		Mean	St. Deviation	p-value
Resting Heart Rate	70	**Pre**	19.79	0.91	.000
		Post	18.23	1.62	
Resting Blood Pressure (Systolic)		**Pre**	136.87	1.67	.000
		Post	132.22	4.01	
Resting Blood Pressure (Diastolic)		**Pre**	85.04	3.85	.000
		Post	83.59	6.29	

DISCUSSION:

This study was carried out to evaluate the effect of calisthenics exercises on coordination, flexibility and endurance playing ability among Kabaddi men players. In this study 15 players were taken received calisthenics exercises for a period of 4 week. Results from this study showed that calisthenics exercises increased the coordination, flexibility and endurance and playing ability of kabaddi players. It was shown that calisthenics exercises were more likely to affect lower limb coordination, both in concentric and eccentric phases of movement. Non dominant extremity improvement was better than on the dominant side. Some research has indicated that measurements without weight bearing cannot reproduce or model real life (Laghate, G., 2016). Regarding primary motions of the lower extremity, such as the landing phase of walking, running, and jumping, they can all be considered closed kinetic chain activities. However, a test such as balance that includes weight-bearing procedures can provide extra sensations that may directly affect joint receptors (Bianco A, 2015). Ashton-Miller et al examined whether targeted exercises improve proprioceptive; their results showed little evidence to support such a conclusion and suggested that the appropriate experiments remain to be conducted (Coughlan GF, et al., 2012). The current study hypothesized that calisthenics training could allow an individual to improve the probability of physical fitness, accuracy of joint-movements sense or the threshold for detecting joints movement and coordination. The only effect was observed in coordination, flexibility and endurance after calisthenics exercise. Calisthenics are a form of dynamic exercise consisting of a variety of rhythmical movements intended to increase body endurance, flexibility with movements such as bending, jumping, swinging, twisting, or kicking, using only one's body weight for resistance. Because most of the exercises are weight bearing, this might improve the coordinative motions. Moreover, significant improvement was observed on the no dominant side with the calisthenics. This result may indicate the loading characteristic of the exercise. Similar to improvements observed in the current study results showed that a calisthenics-based creative dance program could improve knee joint-position sense, and arm positioning at 4 weeks follow-up. In contrast to calisthenics exercises are generally done in the open kinetic chain. They mostly focus on stabilization of the core, the powerhouse of the body. The common view with Calisthenics is that any change created in the core region can affect the quality of distal segmental motion (Craig BW., 2004). Results of another research study has reported that in active middle-aged men and women, exposure to calisthenics exercise for 4 weeks, for two 60-minute sessions/wk, was enough to promote statistically significant increases in abdominal endurance, hamstring flexibility, and upper-body muscle endurance (Burnstein BD, et al., 2011). Previous investigations into the use of calisthenics as a way to improve endurance, body composition, flexibility, and inflammatory markers have been described in the literature (Siqueira Rodrigues BG,2010).

CONCLUSION:

Null hypothesis was rejected and researchers' objectives were supported by the results of the study. Calisthenics exercises were more likely to improve coordination, of the lower extremities, range of motion of joints, muscle endurance capacity after scheduled training exercises. Findingsof the study suggest that calisthenic exercises beinghelpful in improvingfitness level, coordination, flexibility and endurance of kabaddi players be made compulsory part of the training exercises (Hashim A, et al., 2017).

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