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Review Of Research



RELATIONSHIP OF SELECTED MOTOR FITNESS COMPONENTS, ANTHROPOMETRIC MEASUREMENTS AND PHYSIOLOGICAL VARIABLES WITH LONG JUMP PERFORMANCE OF JUMPERS

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ABSTRACT

The purpose of the study was to see the relationship of selected motor fitness components, anthropometric measurements and physiological variables with long jump performance of jumpers. Twenty male athletes aged between 14-18 years were selected from sports authority of India (SAI) Lucknow. The Motor Fitness Components included Speed (50 yard run), Muscular strength (Pull-ups), Muscular endurance (Bent knee sit-ups), Muscular power (Standing broad jump), Circulatory respiratory endurance (600-yards run/walk test), Flexibility (Sit and Reach) and Agility (Shuttle run). Anthropometric Measurements included are Standing height, Weight, Leg length, Upper leg length, Lower leg length, Arm length, Upper arm length, Lower arm length, Hip width, Shoulder width, Chest width, Calf girth, Thigh girth, Chest girth, Upper arm girth and Lower arm girth. Physiological Variables are Resting pulse rate, Positive breath holding time, Negative breadth holding time, Body composition, Systolic blood pressure, Diastolic blood pressure, Respiratory rate and Maximum expiratory pressure. The performance ability of jumpers in motor fitness components namely Speed (50 yard run), Muscular power (Standing broad jump), and Flexibility (Sit and reach) are significant related to long jump

performance. Anthropometric measurements namely Lower arm length, Calf girth and Chest girth are significant related to long jump performance. Physiological variables namely Positive breath holding time, Negative breath holding time and maximum expiratory pressure are significant related to long jump performance. To find out the motor fitness components, anthropometric measurements and physiological variables to long jump performance correlations, Pearson product

moment correlation, multiple correlations, and regression analysis statistical technique were employed.

KEYWORDS: Motor fitness components, Anthropometric measurements, Physiological variables and Jumpers.

INTRODUCTION :

The long jump technique can be effectively broken down into five aspects for analysis the approach run preparation for take-off, take-off flight and landing. Without exception an athlete's longest jumps are



produces as a result of fast and effective approach run. The length of the approach run is depended upon the athlete's capacity for acceleration (based on his/her physical strength and speed) and the stage of training. The ultimate objective of the approach run must be for the athlete to reach maximum controllable velocity prior to take off. The athlete's horizontal velocity at take-off is the single important factor in determining the distance of the jump.

The most important factors regarding the performance is explosive power of the sports persons. This explosive power is mainly measured by various method, one of them is standing broad jump, a brief knowledge about the jump should be there. Jumping, leaping and hopping are all forms of movements in which the body is projected through the air by the propulsive force of the legs. The physical laws which govern any projectile apply to the flight of the body when the projecting force is exerted by either one foot or both feet, and landing is made by both feet, striking the ground at the same time the movement is defined as jump. Jumping is used in some forms or other in almost every activity.

METHODOLOGY:-

Twenty male athletes aged between 14-18 years were selected for this study. These subjects were selected from the Sports Authority of India (SAI) Lucknow. The following Motor Fitness Components included Speed (50 yard run), Muscular strength (Pull-ups), Muscular endurance (Bent knee sit-ups), Muscular power (Standing broad jump), Circulatory respiratory endurance (600-yards run/walk test), Flexibility (Sit and Reach) and Agility (Shuttle run). Anthropometric Measurements included are Standing height, Weight, Leg length, Upper leg length, Lower leg length, Arm length, Upper arm length, Lower arm length, Hip width, Shoulder width, Chest width, Calf girth, Thigh girth, Chest girth, Upper arm girth and Lower arm girth Physiological Variables are Resting pulse rate, Positive breath holding time, Negative breadth holding time, Body composition, Systolic blood pressure, Diastolic blood pressure, Respiratory rate and Maximum expiratory pressure. The necessary data was collected by administering various tests for the chosen variables. The time chosen for assessing the performance ability was administered in the Athletic ground of Sports Authority of India (SAI) and also the Motor fitness components, Anthropometric measurements and Physiological variables. Statistical analysis of data collected on Twenty male athletes i.e Long jump. The data on long jump performance (dependent variables) along with motor fitness components, anthropometric measurements and physiological variables (independent variables) were examined by Pearson's product moment correlation, Multiple correlation, Regression analysis statistical technique was employed.

Findings:-

TABLE-1
RELATIONSHIP OF MOTOR FITNESS COMPONENTS WITH
LONG JUMP PERFORMANCE OF JUMPERS

Variables	Coefficient of correlation 'r'
Speed (50 yard run)	- 0.522*
Muscular strength (pull-ups)	0.196
Muscular endurance (Bent knee sit-ups)	0.411
Muscular power (Standing broad jump)	0.689*
Circulatory respiratory endurance (600-yard run/walk)	- 0.423
Flexibility (sit and reach)	0.465*
Agility (shuttle run)	0.072

From the Table-1 it is clear that three motor fitness components have significant relationship with long jump performance of jumpers. They are 50 yard run (-0.522); standing broad jump (0.689); and sit and reach (0.465). In respect to other motor fitness components (Pull-ups, bent knee sit-ups, 600-yard run/walk and shuttle run) the relationship with long jump performance is not found to be statistically significant at 0.05 level as they are below tabulated value i.e 0.444.

TABLE-2
RELATIONSHIP OF ANTHROPOMETRIC MEASUREMENTS WITH
LONG JUMP PERFORMANCE OF JUMPERS

Variables	Coefficient of correlation 'r'
Standing height	- 0.380
Weight	- 0.378
Leg length	- 0.397
Upper leg length	- 0.363
Lower leg length	- 0.430
Arm length	- 0.412
Upper arm length	- 0.299
Lower arm length	- 0.491*
Hip width	- 0.427
Shoulder width	- 0.277
Chest width	- 0.367
Calf girth	0.481*
Thigh girth	0.461*
Chest girth	- 0.032
Upper arm girth	- 0.285
Lower arm girth	- 0.081

From Table-2 it is clear that three anthropometric measurements have significant relationship with long jump performance of jumpers. They are lower arm length (-0.491); calf girth (0.481); and thigh girth (0.461). In respect to other anthropometric measurements (standing height, weight, upper arm length, lower leg length, arm length, upper arm length, hip width, shoulder width, chest width, chest girth, upper arm girth and lower arm girth) the relationship with long jump performance is not found to be statistically significant at 0.05 level as they are below tabulated value i.e.0.444.

TABLE-3
RELATIONSHIP OF PHYSIOLOGICAL VARIABLES WITH
LONG JUMP PERFORMANCE OF JUMPERS

Variables	Coefficient of correlation 'r'
Resting pulse rate	0.439
Positive breath holding time	0.595*
Negative breath holding time	0.546*
Body composition	- 0.005
Systolic blood pressure	0.167
Diastolic blood pressure	0.184
Respiratory rate	0.192
Maximum expiratory pressure	0.519*

From Table-3 it is clear that three physiological variables have significant relationship with long jump performance of jumpers. They are positive breath holding time (0.595); negative breath holding time (0.546) and maximum expiratory pressure (0.519). In respect to other physiological variables (resting pulse rate, body composition, systolic blood pressure, diastolic blood pressure and respiratory rate) the relationship with long jump performance is not found to be statistically significant at 0.05 level as they are below tabulated value i.e. 0.444.

TABLE-4
COMBINED CONTRIBUTION OF MOTOR FITNESS COMPONENTS, ANTHROPOMETRIC MEASUREMENTS AND PHYSIOLOGICAL VARIABLES WITH LONG JUMP PERFORMANCE OF JUMPERS

Criterion variables	Independent variables	Multiple correlation	Coefficient of multiple correlation
Long Jump	50 yard run (1)	Rc. 146(15)(19)(20)(25)(26)(31)	0.926*
	Standing broad jump (4)		
	Sit & reach (6)		
	Lower arm length (15)		
	Calf girth (19)		
	Thigh girth (20)		
	Positive breadth holding time (25)		
	Negative breadth holding time (26)		
	Maximum expiratory pressure (31)		

Table-4 has disclosed that the combined contribution of motor fitness components, anthropometric measurements and physiological variables of long jump performance are 50 yard run (1); standing broad jump (4); sit and reach (6); lower arm length (15); calf girth (19); thigh girth (20); positive breadth holding time (25); negative breadth holding time (26) and maximum expiratory pressure (31) is significant at 0.05 level of confidence as the computed value of 0.926* Rc. 146(15)(19)(20)(25)(26)(31) for multiple correlation was more than the value of 0.444 required for the multiple correlation coefficient to be significant at 0.05 level of significant with 18 degree of freedom. From the obtained value of multiple correlations it can be deduced that all the above variables taken together contributes to long jump performance of jumpers.

TABLE-5
LINEAR REGRESSION EQUATIONS OF MOTOR FITNESS COMPONENTS, ANTHROPOMETRIC MEASUREMENTS AND PHYSIOLOGICAL VARIABLES WITH LONG JUMP PERFORMANCE OF JUMPERS

S.No	Linear regression equations
1.	Y = 8.99 - 0.40 (50 yards run)
2.	Y = 3.71 + 1.05 (standing broad jump)
3.	Y = 6.28 + 0.03 (sit and reach)
4.	Y = 8.73 - 0.05 (lower arm length)
5.	Y = 4.29 + 0.07 (calf girth)
6.	Y = 4.60 - 0.04 (thigh girth)
7.	Y = 5.08 + 0.03 (positive breadth holding time)
8.	Y = 5.37 + 0.04 (negative breadth holding time)
9.	Y = 7.40 + 0.25 (maximum expiratory pressure)

Where Y = Criterion variables i.e Long jump performance

Multiple linear regression analysis in order to predict long jump performance $Y = 5.375$ (constant) + 0.03 (50 yards run) + 0.561 (standing broad jump) - 0.003 (sit & reach) - 0.045 (lower arm length) - 0.007 (calf girth) + 0.033 (thigh girth) + 0.003 (positive breadth holding time) + 0.013 (negative breadth holding time) - 0.131 (maximum respiratory pressure).

DISCUSSION OF FINDINGS:-

The speed of the individual depends upon two important factors that are frequency of the stride and length of the stride. The frequency of the stride and stride length is directly related to the contractile nature of

the muscles, the contractile nature is proportional to the muscle mass/cross section and quick contraction of the muscle (power), which ultimately produces greater strength and explosive power. Standing broad jump and long jump both are explosive activity and are based on the power generated through the contraction of the working muscles. Physical strength particularly of the legs is one of the contributing factors to successful performance in long jump, as a jumpers will make use of leg strength at the time of take-off. Flexibility is a quality which a long jumpers should possess as one will be able to exert greater force in order to jump higher but flexibility also helps athlete to avoid injuries. Flexibility helps in synchronizing the various movements pattern performed at a greater speed. The long jump events requires flexibility at different parts of the body so as to gaining greater height during take-off and also while landing and shoulder flexibility are required mainly for the flight in the air as these will provide an individual with considerable amount of time. The negative relationship of the upper arm length with the long jump performance may be due to the effect that as the arm length increases the frequency of the movement of the arm length increases the frequency of the movement of the arm will reduce which will lead to the decrease in the frequency of the stride as the arms and legs work alternatively. The calf and thigh girth plays a major role while running and take off, which are both very essential phases of long jump. The calf and thigh muscles affect the movements of the ankle and knee as well as the hip joints. The positive and negative breath holding time both are related to the better oxygen consumption by the working muscles.

REFERENCES:-

1. Burgley Lloyd R. "Relationship of jump and reach measures of power to intelligence scores and athletic performance" *Research Quarterly* 26 (March 1955): 28-35
2. Clarke, H. Harrison, "Application of measurement to health and physical education" 5th ed. (Englewood cliffs, N.J. Prentice Hall, Inc., 1976), P.252.
3. Kansal, Devinder K., "Test and measurement in sports and physical education" (New Delhi: D.V.D. Publication, 1996), P.122.
4. Lindeman, Ralph, "Dynamics of the long jump" *Athletic Journal* (May 1984): 64.
5. Mathews, Donald K. "Measurement in physical education" 5th ed. (Philadelphia: W.B. Saunders Company, 1978), P.19.
6. nuton, John E., "Long jump or triple jump". *Athletic Journal* (February 1971): 44.
6. Wells, Russel F "The relationship of leg strength, body weight ratio and length of the lower limb segments to the vertical jump", *Completed research in health, physical education and recreation* 5 (1963): 78.

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