

NORMATIVE STUDY OF SPEED, EXPLOSIVE STRENGTH AND FLEXIBILITY OF STUDENTS OF DEPARTMENT OF PHYSICAL EDUCATION (T), GURU NANAK DEV UNIVERSITY, AMRITSAR

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Abstract:

The purpose of this study was to construct norms of speed, explosive strength and flexibility of students of department of physical education (T), Guru Nanak Dev University, Amritsar. For the present study, thirty (N=30) male subjects from department of physical education (T), Guru Nanak Dev University, Amritsar, Punjab between the age group of 18-28 years were selected. The statistics, that were collected by controlling tests, was statistically molded to develop for all the test items. In directive to construct the norms, Percentile Scale was used. Additionally, the scores were broken down into 05 scoring system (viz. Excellent, Very Good, Good, Fair and Poor). In Speed: - The scores between 7.996-8.47 was considered Very Good, between 8.47-8.944 was considered Good, 8.944-9.892 was considered Average, 9.892-10.366 was considered Poor whereas the scores between 10.366-10.84 was considered Very Poor. In Explosive Strength: - The scores between 38.148-43.872 was considered Very Good, between 32.424-38.148 was considered Good, 20.976-32.424 was considered Average, 15.252-20.976 was considered Poor whereas the scores between 9.528-15.252 was considered Very Poor. In Flexibility: - The scores between 5.516-3.991 was considered Very Good, between 2.466-3.991 was considered Good, 0.941-2.466 was considered Average, -0.584-0.941 was considered Poor whereas the scores between -2.109 to -0.584 was considered Very Poor.

Keywords: Norms, Explosive Strength, Flexibility, Guru Nanak Dev University.

Introduction

The combination of resistance training (RT) and endurance training (ET) is frequently used in athletic, military, and civilian populations for performance enhancement. Hickson [1] originally reported the idea of interference when attempting to develop strength and cardiovascular endurance concurrently. The divergent nature of physiological adaptations for these methods has been debated in the literature since then [2,3] with some research showing compromised strength gains, whereas endurance capacity is unaffected or attenuated with simultaneous training protocols.[1,3,4,5] More recently, Hakkinen et al. [6] and McCarthy et al. [7,8] demonstrated no deleterious effects on strength development when RT and ET are performed concurrently. A review by Leveritt et al. [9] outlined acute and chronic hypotheses for the possible inhibition during concurrent training, which includes factors such as motor recruitment patterns, endocrine responses, and program design.

Material and Methods

Participants

For the present study, thirty (N=30) male subjects from department of physical education (T), Guru Nanak Dev University, Amritsar, Punjab between the age group of 18-28 years were selected.

Procedure

Speed

(30 Yard Dash Test)

- Subject is asked being thoroughly warmed up, with completion of active warm-up of a duration of about ten-fifteen minutes. The test basically comprises of sprinting a distance of Thirty-yards in a single maximal effort. Upon whistle subject (in stance) sprints to the end point (at a distance of thirty-yards from the starting line), the stopwatch is stopped once the subject's chest crosses the last finish line.

Explosive Strength

(Vertical Jump Test)

- The participant is made to stand next to a graduated wall and is asked to keep the foot flat on the ground and then make a leap upwards and touch the graduated portion of the wall. The attempt is made to reach the highest height possible with the help of spring action of the body. Best of the 3 attempts made, is recorded.

Flexibility

(Sit and Reach Test)

- The participant is asked to remove their shoes. Then, they're made to place their soles on the graduated wooden box. The knees of the participant are locked and are pushed flat with respect to floor. Hands are placed on one another and the participant makes a move towards the measuring line as far as possible and is asked to hold that position for a duration of 1-2 seconds and the distance is recorded. The examiner has to ensure, there hasn't been any jerky movement during the whole process. Score to the nearest half-inch or centimeter is recorded by the former



Table-1: Neuromuscular Components of Fitness, Tests and Criterion Measure.

Variables	Tests	Criterion Measure
Speed	30 Yard Dash Test	Recorded to the nearest 1/100 th Second
Explosive Strength	Vertical Jump Test	Recorded to the nearest Centimeters
Flexibility	Sit and Reach Test	Recorded to the nearest Centimeters

Statistical Procedure

The statistics, that were collected by controlling tests, was statistically molded to develop for all the test items. In directive to construct the norms, Percentile Scale was used. Additionally, the scores were broken down into 05 scoring system (viz. Excellent, Very Good, Good, Fair and Poor).

Results**Table-2: Descriptive statistics of Speed, Explosive Strength and Flexibility.**

Statistics	Speed	Explosive Strength	Flexibility
Minimum	min=8.44	min=14	min=0
Maximum	max=9.98	max=33	max=5
Range	R=1.54	R=19	R=5
Size	n=30	n=30	n=30
Sum	sum=282.56	sum=801	sum=74
Mean	$\bar{x}=9.41866667$	$\bar{x}=26.7$	$\bar{x}=2.46666667$
Median	$\tilde{x}=9.65$	$\tilde{x}=28.5$	$\tilde{x}=2$
Mode	mode=9.89	mode=29, 33	mode=2
Standard Deviation	s=0.474942707	s=5.72441836	s=1.52526613
Variance	s ² =0.225570575	s ² =32.7689655	s ² =2.32643678
Mid-Range	MR=9.21	MR=23.5	MR=2.5
Interquartile Range	IQR=0.89	IQR=6	IQR =2
Sum of Squares	SS=6.54154667	SS=950.3	SS=67.4666667
Mean Absolute Deviation	MAD=0.432844444	MAD=4.44666667	MAD=1.26222222
Root Mean Square	RMS=9.43023506	RMS=27.2867489	RMS=2.88675135
Std Error of Mean	SE \bar{x} =0.086712278	SE \bar{x} =1.04513102	SE \bar{x} =0.278474223
Skewness	γ_1 =-0.419814007	γ_1 =-1.07753527	γ_1 =0.380009772
Kurtosis	β_2 =1.99278466	β_2 =3.59730465	β_2 =2.54165315

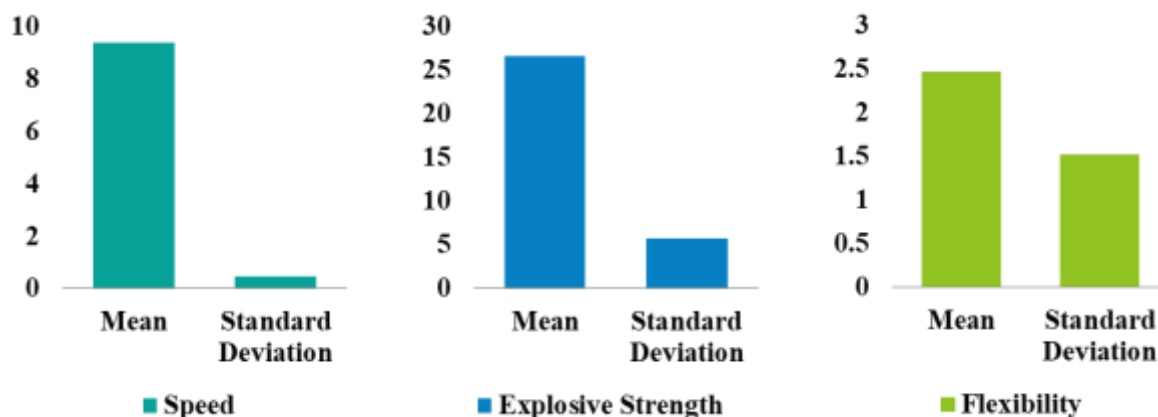
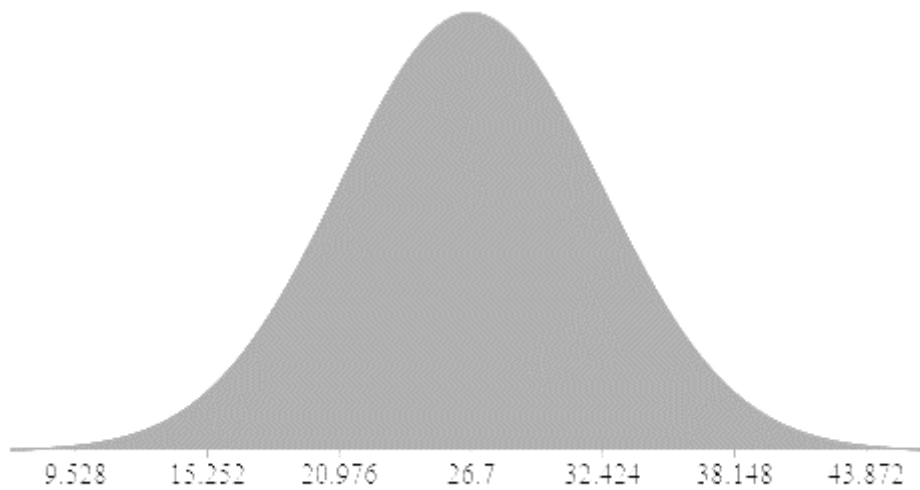
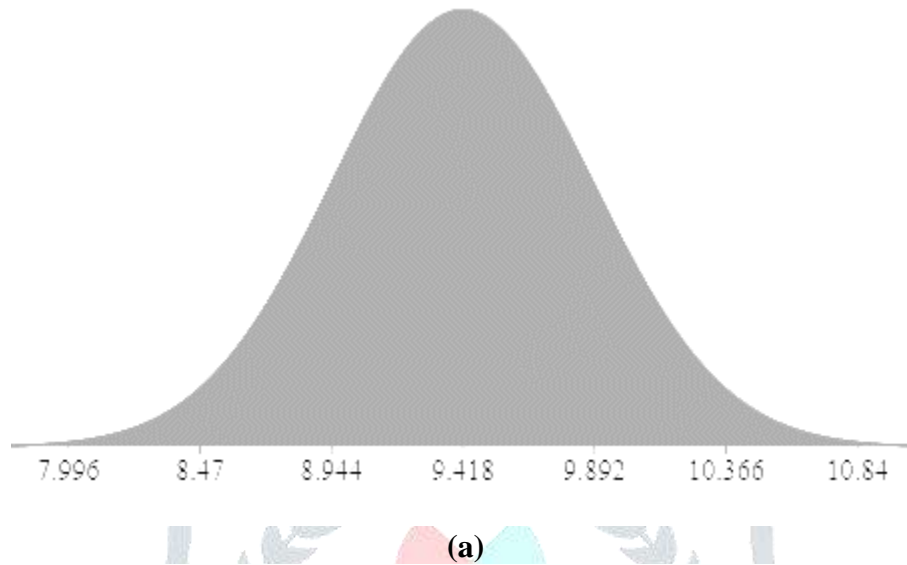
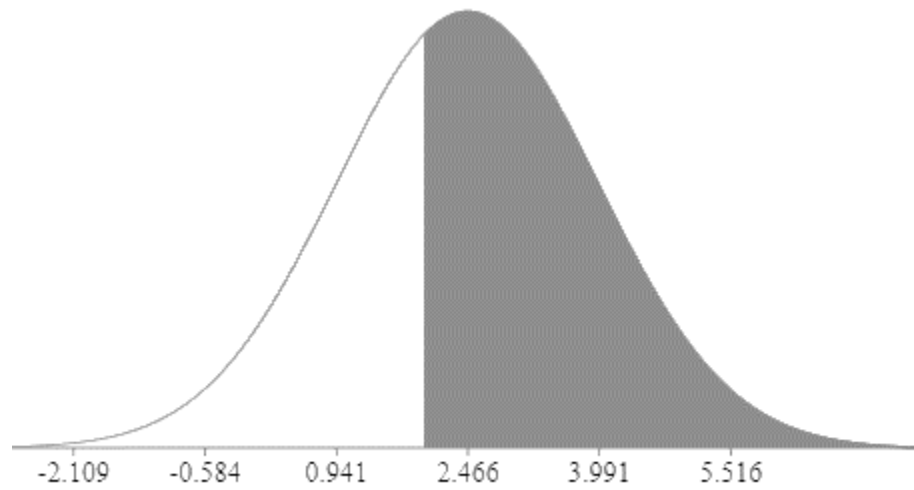
**Figure-1: Graphical representation of Mean & Standard Deviation of Speed, Explosive Strength and Flexibility.**

Table-3: Descriptive Statistics (Mean & Standard Deviation) and Percentile Plot (Hi & Low) of Physical Fitness Test Items of students of Department of Physical Education (T), Guru Nanak Dev University, Amritsar (N=30.)

Sr. No.	Test Items	Mean \pm Standard Deviation		Hi	Low
1.	Speed	9.418	0.474	8.44	9.98
2.	Explosive Strength	26.7	5.724	14	33
3.	Flexibility	2.466	1.525	0	5



(b)



(c)

Figure-2: Graphical illustration of 05 scoring system (viz. Excellent, Very Good, Good, Fair and Poor) concerning Physical Fitness Test Items (viz. a. Speed, b. Explosive Strength & c. Flexibility) of students of Department of Physical Education (T), Guru Nanak Dev University, Amritsar (N=30.)

Table-4: Grades under Normal Distribution of Physical Fitness Test Items of students of Department of Physical Education (T), Guru Nanak Dev University, Amritsar (N=30.)

Sr. No.	Test Items	Very Poor	Poor	Average	Good	Very Good
1.	Speed	10.366-10.84	9.892-10.366	8.944-9.892	8.47-8.944	7.996-8.47
2.	Explosive Strength	9.528-15.252	15.252-20.976	20.976-32.424	32.424-38.148	38.148-43.872
3.	Flexibility	-2.109 -0.584	-0.584-0.941	0.941-2.466	2.466-3.991	5.516-3.991

- ❖ **Speed:** - The scores between 7.996-8.47 was considered Very Good, between 8.47-8.944 was considered Good, 8.944-9.892 was considered Average, 9.892-10.366 was considered Poor whereas the scores between 10.366-10.84 was considered Very Poor.
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