



A CROSSSECTIONAL STUDY TO COMPARE AND ASSESS THE FITNESS AMONG YOUNG FEMALES AND MALES WITH NORMAL BMI

Community Medicine

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ABSTRACT

Background: Fitness is the performance of the heart, lungs and muscle of the body to lead a healthy life. **Aim:** TO assess and compare skill related fitness among young males and females **Methodology:** A cross-sectional study was conducted among 350 young adults in between 18 to 30 years age group in NIMS University, Jaipur and sample was selected by simple random sampling, consent was taken and six skill fitness test was done among them and data was collected in Microsoft Excel and analysis done by SPSS 24. **Result:** There was no significance seen in flamingo balance test, plate tap test and 10*5 shuttle run test and significance was seen in hand grip strength test, bent arm test and broad jump test. **Conclusion:** It has been noted that females as compared to males are more active and lives less sedentary life style

KEYWORDS

Fitness, Agility, Balance, Strength

INTRODUCTION

Physical fitness is considered as most important part of health and physical activity is one of the main element of the physical fitness, this both depend on each other for maintaining the health status of individual^[1]. The new inclusive definition of physical activities proposed as involving “people moving, acting and performing within the culturally specific spaces and contexts, and influenced by a unique array of interests, emotions, ideas, instruction and relationship. Physical activity as any bodily movement produced by skeletal muscles that requires energy expenditure^[2]. “WHO” declares physical inactivity as the 4th main cause of mortality worldwide^[3].

Skill related fitness can be measured by some tools like balance, agility, hand grip strength, broad jump, plate tapping test, bent arm test. This tests give the appropriate reading related to the performance of subject^[4].

Hand grip strength: Muscle strength is a broad term that refers to the ability of contractile tissue to produce tension and a resultant force based on the demands placed on the muscles. Hand grip strength is a structural parameter in biomechanical modelling which is used to check the muscle power of the hand it is considered as a reliable measurement^[5]. Hand grip strength is measured using various type of hand Dynamometers^[6]. Bent-arm hang: It is mainly used to assess the upper body strength. Bent arm test is one of the important test It is used to test the muscular endurance of the arm and shoulder^[7]. Broad jump test: This test used to assess the leg power. It is highly correlated with the amount of force which is produce by the fibres of muscles. The test is often correlated with physical features like lean leg volume. The test is simple and time efficient and does not require any equipment^[8]. Plate tapping test: Upper limb speed which is a skill fitness component can be measured using plate tapping test Along with upper limb speed plate tapping test also measures upper body reaction time and hand eye coordination^[9]. Flamingo balance test: Balance is a condition in which the forces acting on the body are neutralized in such a way that COM within the stability will limits the boundaries of BOS. As the COM and COG of a body moves over the BOS the balance increase^[10]. This test is mainly used to examine the dynamic balance for lower limb and pelvic muscles. Agility test: Agility is a rapid whole bodily movement with change of direction in response to external stimuli^[11]

BMI ranges

For most adults, an ideal BMI is in the 18.5 to 24.9 range. For children and young people aged 2 to 18, the BMI calculation takes into account age and gender as well as height and weight. If your BMI is:

- below 18.5 – underweight range
- between 18.5 and 24.9 – healthy weight range
- between 25 and 29.9 – overweight range
- between 30 and 39.9 – obese range

AIM OF THE STUDY

The aim of the study to find out the skill related fitness test in young adults between males and female

METHODOLOGY

350 young adults aged between 18-30 years of age participated in a cross-sectional study. Among them, females were 206 and males were 144. Participants who met the inclusion criteria and willingly participate in the study were taken. Informed consent form was obtain from each participant.

Inclusion Criteria

- Both males and females
- Age: 18-30 years
- BMI: 18.5 and 24.9

Exclusion Criteria

- Musculoskeletal problem
- Metabolic disorder
- Cardiovascular problem
- Anaemic children
- Menstrual period
- Genetic and Hereditary problem
- Pregnant Females

The subject who met to inclusion criteria were divided into two groups, group-A Females with normal BMI and group –B males with normal BMI. All the subjects underwent total of 6 skill fitness test as flamingo balance test, 10 x 5 shuttle run test, plate tapping test, hand grip strength, bent arm test, broad jump test

Flamingo balance test

It measures the balance of subject, specifically the dynamic balance, pelvis, lower limb muscles. Subject was asked to remove shoes, followed by stretching the body muscles. The subject is directed to get on the balance beam with support. comfortable leg should be placed on beam asked the subject to flexed the knee so that heel touches to buttock and held with one hand and time recorded how much time subject able to hold the position, if the subject falls 15 times in 30 seconds should be terminated from the test and zero was marked, the total number of falls should be marked in 60 sec.

10 5 Shuttle Run Test

It check the agility and speed of an individual. The cones are placed 5 meters apart from each other. The participants asked to run from one end of cone to other end of cone and return to starting position. This has to be done repeatedly for 5 times and covering 50 meters of distance. The total time should be noted down by stopwatch. The subject with good agility complete the task in less time.

Plate Tapping Test

It measures the speed of the upper limb, the upper body reaction time and hand coordination. The subject was made to stand in front of a table which had two discs placed 60 centimetres apart from each other with a rectangular plate placed in between the two discs. The subject is asked to keep his non-dominant hand on the rectangular plate. Then the subject is asked to tap the discs alternatively using the dominant hand. 25 cycles or 50 taps. Measure the time taken to complete -eye the cycle.

Hand Grip Strength

Hand grip strength can be measured by using hand dynamometer. Maximum amount of static force generated in a single muscular contraction against resistance. It is test to check the isometric strength of hand and forearm. Jamar hand dynamometer is most reliable and valid tool to measure the hand grip strength Patient hold the equipment on the dominant hand, after this patient will be asked to squeeze the meter where the rating or score will be displayed on the meter and it is to be hold for 3 to 5 seconds.

Bent arm test

It is an anti-gravity skill test to assess the upper body strength .Main purpose of this test is to examine the strength of the flexor muscles of the arm. AN overhead trapeze is used in this test, and the subject is asked to keep the chin above the trapeze. The elbow should be flexed and chin to be placed above the trapeze with the chest close to the trapeze and legs hanging straight with knees in extension. Body should be stable. Time should be noted whenever the chin deviates from the midline.

Broad jump test

This test is used to assess the leg power. Wakai and Linthorne divided the test into three parts:

- take-off distance: Defined as the horizontal distance between the line of take-off and the subject's centre of mass at the instant of take-off.
- The flight distance is the horizontal distance travelled by the centre of mass while in the air.
- The distance between the Centre of Mass and heel of the feet during landing is known as landing distance

The score obtain from this balance, agility, hand grip strength, Shuttle run test, bent arm test, broad jump test were compared between females and males normal BMI.

Sampling Technique: Simple random sampling

Study Area: NIMS University, Jaipur

Statistical Analysis: Data was compiled in Microsoft Excel, data was analyzed in SPSS 24

STATISTICAL ANALYSIS:

The result obtained were expressed as mean and standard deviation. A p value <0.05 considered as statistically significant

RESULT:

206 girls and 144 boys participate in the study, they all are healthy adolescent. They were divided into the group a) Girls and group b) boys.

Number of Participants

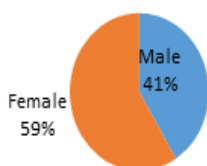


Figure 1: Number of Participants

There is a statistically significant difference among girls and boys in broad jump test, bent – arm hang and hand grip strength as the p- value is less than 0.05. All the participants were assessed for skill related fitness among girls and boys.

The comparison between boys and girls for flamingo, broad jump, plate tap, hand grip, bent arm, 10*5 Shuttles run skill components in normal group

Components	Gender	N	Range	Mean	SD	P-Value
Flamingo balance Test (FBT)	Boys	144	0 to 6	1.08	1.49	0.484
	Girls	206	0 to 9	1.36	1.99	
Broad jump (BJ)	Boys	144	97 to 211	159.6	33.28	<0.0001
	Girls	206	110 to 227	179.6	23	
Plate tap test (PTT)	Boys	144	12.12 to 28.2	17.95	5.03	0.316
	Girls	206	10.5 to 29.02	17.59	3.79	
Hand grip strength (HGS)	Boys	144	13.6 to 45.35	27.01	6.79	<0.0001
	Girls	206	27.21 to 50	37.81	6.06	
Bent arm hang (BAH)	Boys	144	0.2 to 37.7	9.14	6.80	<0.0001
	Girls	206	0.1 to 42.43	14.67	11.23	
10*5 Shuttles run (AT)	Boys	144	11.1 to 16.81	13.92	1.32	0.091
	Girls	206	11.2 to 16.45	13.68	1.13	

Table 1 shows Mean, Standard deviation, Significance p- value of flamingo balance test, broad jump test, plate tap test, hand grip, bent arm hang and shuttle run test in normal BMI group of girls and boys. Girls group shows mean is 1.08 and S.D is 1.49 and boys group shows mean is 1.36 and S.D. is 1.99 in flamingo balance test. Girls group shows mean is 179.6 and S.D is 23 and boys group shows mean is 159.6 and S.D is 33.28 in broad jump test. Girls shows mean value 17.59 and S.D is 3.79 and boys shows mean value 17.95 and S.D. is 5.03 of plate tap test. Hand grip strength test shows mean value in girls 37.81 and S.D is 6.06 and in boys mean value is 27.01 and S.D is 6.79. Bent arm hang test mean 14.67 and S.D is 11.23 in girls and boys group shows mean 9.14 and S.D is 6.80. Mean value of shuttle run test in girls 13.68 and S.D value is 1.13 and in boys group mean 13.92 and S.D is 1.32.

Table shows p- value is <0.0001 which is less than 0.05 between the group of girls and boys in broad jump, hand grip and bent arm test.

Table 2 Shows BMI of male and female participants

Parameter	Gender	N	Range	Mean	SD	P-value
BMI	Male	144	16.1 to 24.9	20.81	1.95	0.675
BMI	Female	206	16.8 to 23.2	20.92	1.66	0.675

Girl group shows Mean BMI of 20.92 as compared to boys group which shows mean BMI of 20.81 with P-value of 0.675 respectively

DISCUSSION

The prime objective of this study was to determine the difference present in skill fitness test in healthy young adult. To analyse the same, data was collected among the young adult aged 18-30 years of NIMS university, Jaipur. The different such as flamingo balance test, plate tap test and 10*5 shuttle run test revealed no significant difference. Consequently, the p-value was observed greater than 0.5

Balance depend upon the greater regulation of sensory motor system that is vestibular, visual and proprioceptive stimuli and also co-related with body weight. Mechanoreceptor present on the plantar aspect of the foot that helps in control the balance in individual. The p-value obtain was 0.484 that greater than 0.5 that indicate there was no significant difference between young females and males in flamingo balance test.

Agility requires a speed and strength of an individual that requires a attention and postural balance, Normal young adult group shows good agility score among males and females as the p-value is 0.091 which is higher than 0.05 that suggest that there was no significant difference between males and females in 10*5 shuttle run test.

Plate-tapping test is a motor activity which require balance, co-ordination, quick receptor to stimuli, strength and speed of an individual. Which are dependent on cognitive and musculoskeletal and co-ordination of a person. Which is seen good in young adults as the p-value was 0.316 which is higher than 0.05 that states that there was no significant difference among males and females in plate-tapping test. Broad jump, bent-arm test and hand grip strength revealed significant difference among males and females. The mean value of bent-arm test

in males is 9.14 and SD value is 6.80 and in female mean value is 14.67 and SD is 11.23 and p-value was <0.0001 which is less than 0.05 that states significant difference between males and female, as female could perform better than males in BAH test.

The mean value of broad jump test in males was 159.6 and SD value was 33.28 and in female 179.6 and SD was 23 and the p-value was <0.0001 which was less than 0.05 that indicate significant difference among female and males, female perform significantly higher jump better than males.

The mean value of young adults in males was 27.01 and SD was 6.79 and in females mean was 37.81 and SD was 6.06, the p-value was <0.0001 which is less than 0.05 that states significant difference between young males and females, according to result female shows higher strength than males in hand-grip strength.

CONCLUSION

The cross-sectional comparative study provides information about the skill fitness test in healthy young adults between males and females, it explores the relationship between males and females in flamingo balance test, agility test and plate-tapping test shows no significance. Broad jump, hand grip and bent arm test shows significance among males and females in females shows significantly higher result than males as females are more active and involve more in weight-bearing activity and live less sedentary life style than males.

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