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Flexibility and abdominal strength of college women in relation to their intelligence

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Abstract
The present study was conducted in MCM DAV College for women and Government College for women sec 42 Chandigarh. The data was collected for physical and psychological variables of women**.** American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD, 1980 test was used. Intelligence was judged using Standard Progressive Matrices (SPM) test (Raven 1969).

Keywords: Intelligence, physical fitness, flexibility, strength

Introduction
Plato (428-348 B.C.) was the first to begin the discussion on intelligence with his tripartite division of the "rows", which covered the concept of soul, mind, spirit and thinking as well as that of mental ability. The first scientific use of the concept of intelligence was coined by Binet and Simon (1916) [16] stating that intelligence is a capacity to make rational judgement, with minimum formal schooling. The components of intelligence are reasoning, judgement, memory and the power of abstraction Human intelligence has an intimate relationship with the anatomical structures and physiological functions of the nervous system. Barrel (1974) maintains the evidence that physically fit persons lead longer lives, have a better performance records, and participate successfully in life than those who are unfit, whose number is mounting. Explaining the relationship among intelligence, health and physical fitness, and self-concept, Kennedy (1977) said that intelligence and skill could function at the peak of their capacity only when the body was healthy and strong and it was physical fitness that was the most important key to healthy body. Thus, physical fitness is the basis of dynamic and creative intellectual activity. Development of personality and health of a person.

Keeping in view the direct link between one's Healths, quality of life that may be in terms of total personality, it is essential to explore the various aspects of a person, one of which is good health. Thus the present study had been designed to investigate the different aspects of health related fitness of college women having different levels of intelligence procedure.

The sample of 500 students studying in different degree classes of B.Sc., B.A. and B.Com in Mehar Chand Mahajan D.A.V. College for Women, Sector 36 and Govt. College for Women, Sector 42, Chandigarh were selected by using sample random sampling technique as subjects for this study. The age of these subjects ranged from 17 to 24 years. This investigation was carried out in two stages. In first stage Standard Progressive Matrices (SPM) test (Raven 1969) for intelligence was administered on 500 chosen subjects to judge their level of intelligence. On the basis of intelligence level as measured by SPM, three groups namely high (>48), average (37 - 48) and low (<37) were formed out of five hundred subject as study groups in second stage. Each group consisted of 50 subjects.

Variables
- Abdominal Strength
- Flexibility
- intelligence

Health related physical fitness was measured by AAHPER (1987) health related fitness test.

1. Body composition (fatness of Triceps and sub scapular) was measured in millimetres by skinfold caliper.
2. The Abdominal strength was tested by using modified Sit-up test executed for one minute. The score was recorded in number.
3. The Spine or Hip flexibility was measured in centimetres using Sit and reach test.
4. Intelligence was judged using Standard Progressive Matrices (SPM) test (Raven1969).

Analysis and discussions

Descriptive statistics of heath related fitness variables namely cardio respiratory endurance, abdominal Strength, flexibility and body composition (fatness of triceps and sub scapular region) of college women belonging to high, average and low level of intelligence; has been given in table 1 and their means have been depicted in figures 1 and 2.

Table 1: Descriptive of health related physical fitness of college women belonging to high, average and low intelligence groups

Variable	Group	N	Mean	Std. Deviation	Std. Error
Abdominal Strength (Sit Ups)	High	50	16.16	8.949	1.265
	Average	50	18.24	8.455	1.195
	Low	50	16.62	5.893	0.833
Flexibility (Sit & Reach)	High	50	29.33	5.603	0.792
	Average	50	29.40	5.514	0.779
	Low	50	27.09	6.774	0.958

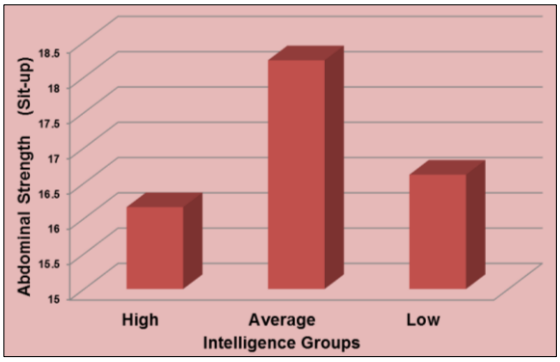

Fig 1: Abdominal strength (Sit-up) among college women having high, average and low intelligence

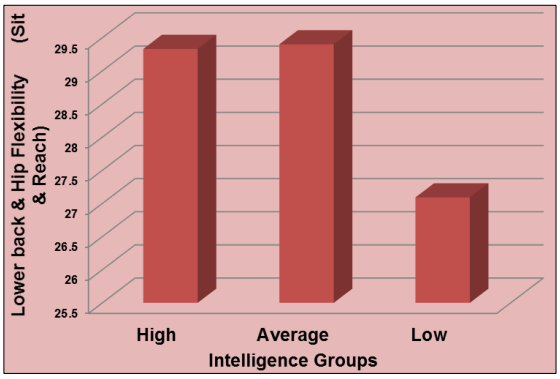

Fig 2: Lower back and hip flexibility among college women having high, average and low intelligence

An examination of table.1 revealed that the college women having average intelligence were stronger in abdominal strength (M=18.24) than the subjects having high and low intelligence. Similarly, they (average intelligence group) were more flexible in lower posterior thighs (M = 29.40) than their counterparts of high and low intelligence. The average intelligence group was also performed better in cardio-respiratory fitness (M =1082.00) as compared to high and low intelligence groups of college women. Whereas all three group of high, average and low intelligence had shown almost similar fatness in triceps and sub scapular sites although average group (M =21.68) had edge over other groups.

one way analysis of variance (ANOVA) for inter group differences among college women having high, average and low level of intelligence on health related physical fitness and its components has been presented in table.2.

Table 2: Analysis of variance (Anova) on scores of health related fitness components of college women belonging to high, average and low intelligence groups

Variable	Group	Sum of Squares	df	Mean Square	F
Abdominal Strength (Sit Ups)	Between	119.373	2	59.687	0.961
	Within	9129.620	147	62.106	
	Total	9248.993	149		
Flexibility (Sit & Reach)	Between	172.643	2	86.322	2.404
	Within	5277.650	147	35.902	
	Total	5450.293	149		

*Significant at 0.05 level $F_{0.05}$ (2,147) = 3.06

To ascertain the relationship between intelligence of college women and their health related physical fitness variables the Pearson's product moment correlation was computed and coefficients of correlation (r) has been given in table 3

Table 3: Relationship of health related fitness components to intelligence of college women

S. No.	Variables Correlated	Coefficients of Correlation (r)
1	Abdominal Muscular Strength endurance (Sit ups) and Intelligence	0.029
2	Lower back Flexibility (Sit & Reach) and Intelligence	0.230*

It may be observed from table 3 that intelligence of the subjects was significantly related to health related physical fitness variables of lower back flexibility (r = 0.250)

Recommendations

In the light of conclusions arrived at in this investigation, the following recommendations may be made:-

1. Educational Institutions may continue to offer or increase opportunities for health related fitness through physical activity and sports as it helps in improving intelligence, self-concept and academic performance.
2. Health related physical fitness may impact cognitive skills, abilities, concepts and attitudes which are important components of improved personality and academic performance.
3. Same type of studies may be done on female and male counterparts of different age groups.

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