

Associations Between Self-Perceived and Measured Physical Fitness of Male College Students

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Abstract: The purpose of this study was to evaluate associations between Self-perceived and measured physical fitness of male college students. The target population consisted entirely of male students of University of Guilan, Iran. Among them non-athlete male with mean age of 21.83 ± 1.17 years, height 173.6 ± 6.4 cm, weight 70.66 ± 11.8 kg and body mass index 22.38 ± 3 kg/m², volunteered to participate in this study, respectively. The participants (n = 150) completed a five item self-reported questionnaire to estimate their physical fitness levels. Self-perceived fitness (SPF) was assessed using a five-component questionnaire in which subjects indicated on a 13-point rating scale their perceived endurance, flexibility, strength, body composition and overall fitness. Results show that there were significant correlations between self-perceived of endurance and 1500-m running time ($r = -.17$); but, the correlation between self-perceived of strength and composite strength scores (handgrip dynamometry, hand-grip tests) ($r = .09$); self-perceived of flexibility and sit and reach scores ($r = -.033$) and self-perceived of body composition ($r = .042$) was not significant. The collected data was analyzed by descriptive (mean and standard deviation) and deductive statistical used to relations between variables were described by using Pearson correlation coefficient. In all subject, self-perceived scores higher than actual fitness scores. The results clearly indicated that non-athlete male student's did not sufficient skills to competently undertake self-perceived of their fitness.

Key words: Students • Physical fitness • Self-perceived

INTRODUCTION

Physical fitness is an important part of human functionality related to health and wellbeing. Fitness is characterized by a person's capability to function in and adapt to physical exercise and can be demonstrated through the operation of body systems associated with energy supply and energy transmission, circulation and respiration and the performance of muscles and other soft tissues [1-3]. In a typical definition of health-related physical fitness, many components are measured, such as cardio respiratory endurance, muscular strength and endurance, flexibility and body composition. Self-perceived of one's own physical fitness is a multi-dimensional phenomenon. The concept of self-perceived is usually divided into physical, emotional, cognitive and social areas [4-6], whereas the conscious physical concept of over self refers to the experience of the qualities of self-perceived physical fitness and body

structure as well as appearance [4, 5, 7]. According to the theory by Soenstrom (1978), physical fitness affects self-esteem through physical competence. Self-perceived physical competence is part of the general self-perception and it is usually divided into physical competence, body image, self-estimated physical strength and physical fitness [8-11].

Previous studies, reported low and non-significant correlations between perceived and measured fitness among adults [11-13]. Also Brandon and Evans (1988) observed notable discrepancies between Self-perceived and measured fitness in their study [11]. Marsh and Redmayne (1994) reported correlations between self-perceive and measured fitness that for the strength, flexibility and balance endurance were low [13]. Marsh (1993) reported low, but significant ($p < 0.01$) associations with numerous fitness indicators, including cardiovascular endurance ($r = 0.30$), muscular strength ($r = 0.29$) and body composition ($r = -0.33$) [14].

While inconsistent with these studies, Williams and Purewal (2001) observed that the correlation between questions about self-perceived endurance and the results of the submaximal bicycle ergometer test and the correlation between questions about effective performance and an anaerobic bicycle ergometer test was significant [15]. Lamb (1992) reported higher and significant correlations between self-perceived and measured fitness [16]. Marsh and Redmayne (1994) reported correlations between self-perceived and measured fitness that for the endurance component was highest ($r=0.64$) [13]. Lamb and Hayworth (1998) found strong significant correlations between self-perceived and objective measures of endurance, strength and flexibility for large sample of English adolescents [17]. The Vuori *et al.*, (2004) found in 1986 that 57% of the girls and 62% of the boys estimated their physical fitness at good or very good [18]. In 2002, the results indicated that 80% of the girls and 77% of the boys estimated that they have good or very good physical fitness [18].

In general, Previous studies due to low sample, poor physical fitness test program design, use of old norms to evaluate fitness performance of the subjects, Only a small number of studies have used more detailed self-estimation of fitness measures and compared the results with actual measures of fitness and finally, from these data, there are contradictory indications regarding the correlations between self-perceived and measured physical fitness. For this reason the purpose of this study was to study of an association between self-perceived and measured physical fitness of male college students.

MATERIALS AND METHODS

Subject: The target population consisted entirely of male students University of Guilan in Iran. Among them 150 non-athlete male selected randomly. The condition of the study was thoroughly explained to all subjects and written informed consent was subsequently obtained. The study protocol was approved by the Ethics Committee of University of Guilan.

Procedures: Self-perceived fitness (SPF) was assessed using a slightly modified version of a questionnaire by Delignieries *et al.*, (1994). Delignieries *et al.* had adopted the four- factor model of perceived fitness identified by Abadie, (1988) amongst adults and added a fifth, more general 'fitness' factor [19, 20]. Accordingly, for the present study the subject were required to indicate on a

scale of 1 to 13 their self-perceived of "Fitness", "Strength", "Endurance", "Flexibility" and "Body Composition", relative to actual fitness. The first of the five scales Fitness represented a general assessment without additional explanation, whereas the other four scales were qualified with a short description. All five components had verbal anchors against each odd value on the rating scale; a value of 1 indicating a perceived lack of the attribute, a value of 7 indicating a normal amount and 13 indicating an abundance of it (see Appendix). Measurement of fitness were conducted following the completion of the SPF questionnaire and comprised tests which are commonly used in health-related fitness assessments of college student. The measurement taken included height, weight, flexibility (in centimeters) and strength (in kilograms) using the sit and- reach test, handgrip dynamometry and endurance (running distance was set at 1500-m) respectively, using procedures described by Adams (1994). Body composition was represented as the sum of the suprailiac, abdominal and pectoral (chest) skinfolds (in millimeters), following the recommendations of Boileau *et al.*, (1985), measured in the standardised manner described by Jackson and Pollock (1978) [21-23].

Data Analysis and Statistical Methods: The index of Self-perceived physical fitness was calculated by summing up the scores of Self-perceived endurance; strength, flexibility and body composition (Table 2). The index of endurance was calculated by summing up the scores of Self-perceived endurance and those of the Self-perceived distance they could run. The index of measured physical fitness was calculated separately by summing up the scores of the z-scores of, body composition test, hand-grip test, handgrip dynamometry test, sit-and-reach test and endurance test.

SPSW statistical software (version 18) was used to analyze the descriptive data (mean and standard deviation) and Deductive Statistical used to relations between variables were described by using Pearson correlation coefficient.

RESULTS

Subject anthropometric data are present in Table 1. Correlations between self-perceived fitness items and normative scores for the objective measures are shown in Table 3. In Figure 1, show association between the indices of measured physical fitness (z-scores) and

Table 1: Subjects' characteristics

Characteristics	Mean \pm SD (n=150)
Age (years)	21.83 \pm 1.17
Height (cm)	173.6 \pm 6.4
Weight (kg)	70.66 \pm 11.8
BMI (kg/m ²)	22.38 \pm 3
Percentage of fat (sum of the suprailiac, abdominal and pectoral)	17 \pm 2.1

BMI, body mass index, SD, standard deviation.

Table 2: Mean and standard deviation of the physical fitness tests

Physical fitness tests	Mean \pm SD (n=150)
Endurance 1500 m	7.21 \pm 0.740
Flexibility Sit and Reach (cm)	34.23 \pm 7.930
Body composition	
Percentage of fat Pectoral	18.03 \pm 8.50
Percentage of fat Abdominal	11.90 \pm 5.100
Percentage of fat Suprailiac	15.46 \pm 6.080
Strength	
Test for the right hand - grip(kg)	44.31 \pm 7.770
Test for the left hand - grip (kg)	40.04 \pm 7.630
Test for the upper body handgrip dynamometry (kg)	42.64 \pm 12.46
Test for the lower body handgrip dynamometry (kg)	55.71 \pm 13.99

Table 3: Associations between Self-perceived physical fitness characteristics and measured physical fitness tests Pearson correlation coefficient of order)

Measure	Self-perceived			
	Endurance	Flexibility	Body composition	Strength
Endurance	-.17 **			
Flexibility		.033		
Body composition			.042	
Strength				.09

p < 0.01 **

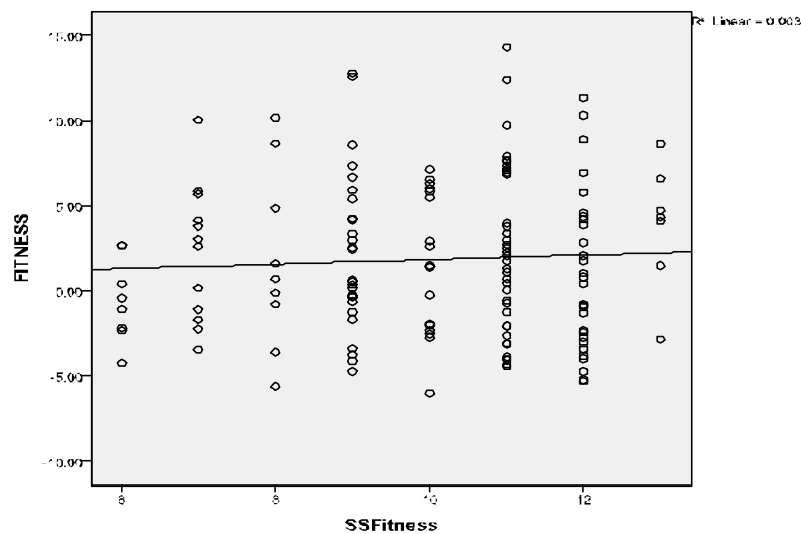


Fig. 1: Association between the indices of measured physical fitness (z-scores) and self-estimated physical fitness

self-perceived physical fitness (Spearman's correlation coefficient of order) were shown. Result show that significant correlations were found between self-perceived of endurance and 1500-m running time ($r = -.17$); but, the correlation between self-perceived of strength and composite strength scores (handgrip dynamometry, hand-grip tests) ($r = .09$); self-perceived of flexibility and sit and reach scores ($r = -.033$) and self-perceived of body composition ($r = .042$) was not significant.

DISCUSSION

The purpose of this study was to evaluate the relationship between the self-perceived and objective assessments of physical fitness for non-athlete male students.

Scores for the cohort were simply ranked from highest to lowest, as with the five SPF scales. The result show that correlations between the indices of self-perceived and measure physical fitness were low and non-significant. These data are similar to the study done by Huotari *et al.*, (2009) and Marsh (1993), reported correlations between the self-perceived and measure physical fitness were non-significant [3, 14]. But, in contrast Mikkelsen *et al.*, (2005), shows that subject can estimate at group level their fitness [2], also Lamb *et al.*, (1998), Magnus *et al.*, (2004) reported correlations between the self-perceived and measure physical fitness were significant [16, 24].

Previous study show that physical activity level, subject, gender and age, [2, 16, 24, 25], could effect on self-perceived they the difference between our results and Lamb *et al.*, (1998), Magnus *et al.*, (2004), Mikkelsen *et al.* (2005), Chung may be is due to differences in subject (old men and women, adolescent VS Youth) [2, 16, 24], physical activity level (non-athlete VS. athlete) [25, 26], gender (male and female VS male) [24, 27, 28] and age (21 yr VS 40 yr Mikkelsen, 15.4 yr Lamb and Maiano).

Also The result show that significant correlations were found between self-perceived of endurance cardiovascular and 1500m running time ($r = -.17$) the result in this study is lower than that observed by Marsh *et al.*, (1993) (0.30) [13], Delignieres *et al.*, (1994) ($r = 0.74$) [19], Ellam *et al.*, (1994) ($r = 0.20$) [29], Lamb *et al.*, (1998) ($r = 0.70$) [16], Mikkelsen *et al.*, (2005) ($r = 0.53$) [2] and Huotari *et al.*, (2009), ($r = -0.69$) [3]. Previous study shows that subject, measure of test and questionnaire type [3, 15, 25, 26], the difference between our results and Marsh *et al.*, (1993), Delignieres *et al.*, (1994), Ellam *et al.*, (1994), Lamb *et al.*, (1998), Williams *et al.*,

(2001), Mikkelsen *et al.*, (2005) and Huotari *et al.*, (2009) [2, 3, 14, 15, 16, 19, 29]. However, may be the main reason for correlations lower self-perceived of endurance in this study, all subjects the high self-perceived demonstrated higher score corresponding objective measures.

The results of present study also not Significant correlations were found between indicate that self-perceived of strength and (handgrip dynamometry, hand-grip tests), flexibility and (sit and reach) body composition and (sum of the suprailiac, abdominal and pectoral). These data in line with the study Huotari *et al.*, (2009), reported correlations between the self-perceived and measure strength, flexibility were non-significant [3].

Previous study show that subject, gender and age, measure of test, questionnaire type and BMI [15, 24-27], could effect on self-perceived they the difference between our results and Marsh *et al.*, (1993) [13], Ellam *et al.*, (1994) [29], Lamb *et al.*, (1998) [17], Mikkelsen *et al.*, (2005) [2], probably due to differences in subject (old men and women VS youth), (21 yr VS 40 yr), measure of test (standing long jump, sit-ups and shoulder hand/pull-ups VS handgrip dynamometry, hand-grip tests and sum of the tricep and subscapular skinfolds VS sum of the suprailiac, abdominal and pectoral), questionnaire type (self-estimated questionnaire VS self-perceived questionnaire) and BMI (25 VS 22).

Present finding is reinforced somewhat by the low, non-significant association between perceived body composition and skinfold thickness. Though this is surprising, given the specificity of the questionnaire item, such an apparent mis-Self-perceived of body composition is not a new discovery. Fox (1994) hinted that adolescents' notions of over-fat are inaccurate, resulting in unnecessary dietary restraint and possibly reduced self-esteem [30].

Previous studies demonstrated that athlete's student college who usually spend more time on physical activity and sport training to have better in self-perceived fitness than their non-athlete [14, 25]. Researchers believed that athletes had invested heavily in their sports performance and frequently received positive informational feedbacks were essential for the development and maintenance of self-perceive [25, 30]. The studies revealing that strong relationships between actual and perceived physical fitness [31], as well as physical fitness and physical ability self - concept [13, 31]. Roid *et al.*, (1988) stated that the individuals self-perceive has been demonstrated to be highly influential in much his/her behavior and also to be directly related to general personality and mental health

[32]. It can be expected that individuals with positive physical self-perceive may be more active and those who actively involved in physical activity may have higher physical self-perceive.

CONCLUSION

The key implication of the present findings is that for future investigations in which student self-perceived of fitness are deemed important, such as those concerned with nurturing self-perceive through physical activity and the development of physical abilities, or those dealing with the impact of university-based health-related fitness education and monitoring, measurement should be addressed from a multi-dimensional perspective. Without this, the outcomes of any interventions may be obscured or inappropriately evaluated. A questionnaire such as that used in this study (or a modified version where language comprehension is threatened) can provide the means to represent the Self-perceived fitness construct in student. In the future, it would also be interesting to focus physical fitness measurements by specifying the questions concerning, for example, those performances that the subjects think they are capable of doing. For instance, the subjects could be asked, "How many kilometers can you walk, jog or run?" and "When walking up stairs, do you get out of breath after one, two or three floors?"

Perspectives: On the one hand, the use of physical activity is increasingly being promoted as a means of prevention of chronic disease (overweight, obesity and blood pressure...) on other hand; the economic resources for health care are limited. Tailoring a physical activity program for the prevention of a disease is based on the knowledge of the baseline fitness of the student.

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Appendix

Self-Perceived Fitness Questionnaire

In each of the fitness scales below, please circle the value (1 to 13) that you think best describes your current level. The statements that appear above the options are there as a guide to help you understand what each scale refers to. Please answer honestly, as all information given will be treated in strict confidence.

Fitness

1. I am completely unfit.
2.
3. I have a poor fitness level with regard to my age.
4.
5. My fitness is slightly below the average for those of my age.
6.
7. My fitness is quite normal with regard to my age.
8.
9. My fitness is slightly above average for those of my age.
10.

11. I have a very good fitness level with regard to my age.
12.
13. I am exceptionally fit.

Strength

This scale refers to your capacity to perform intense muscular work of a short duration, e.g. lifting, carrying heavy objects (weights).

1. I have absolutely no strength
2.
3. I have poor strength with regard to my age.
4.
5. My strength is slightly below the average for those of my age.
6.
7. My strength is quite normal with regard to my age.
8.
9. My strength is slightly above average for those of my age.
10.
11. I am very strong with regard to my age.
12.
13. I have exceptional strength.

Endurance

This scale refers to your ability to sustain prolonged effort, e.g. in running, walking, cycling.

1. I have absolutely no endurance.
2.
3. I have poor endurance with regard to my age.
4.
5. My endurance is slightly below the average for those of my age.
6.
7. My endurance is quite normal with regard to my age.
8.
9. My endurance is slightly above average for those of my age.
10.
11. I have very good endurance with regard to my age.
12.
13. I have exceptional endurance.

Flexibility

This scale refers to your capacity to perform movements requiring bending, stretching etc.

1. I am definitely not flexible.
2.
3. I have poor flexibility with regard to my age.
4.
5. My flexibility is slightly below the average for those of my age.
6.
7. My flexibility is quite normal with regard to my age.
8.
9. My flexibility is slightly above average for those of my age.
10.

11. I have very good flexibility with regard to my age.
12.
13. I have exceptional flexibility.

Body Composition

This scale refers to the relative amounts of fat and muscle in your body.

1. I am abnormally fat.
 2.
 3. I am too fat with regard to my age.
 4.
 5. I am a little too fat with regard to my age.
 6.
 7. My body fat is quite normal with regard to my age.
 8.
 9. I am quite lean with regard to my age.
 10.
 11. I am very lean with regard to my age.
 12.
 13. I am exceptionally lean.
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