

ASSESSING HEALTH-RELATED FITNESS AMONG COLLEGE-GOING STUDENTS IN DELHI: A CROSS- SECTIONAL STUDY

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Abstract

Health-related fitness (HRF) is a critical determinant of overall well-being, particularly among college students who undergo significant lifestyle changes due to academic stress and altered physical activity patterns. This cross-sectional study aimed to assess HRF components among 300 college students (150 males, 150 females) aged 18–25 years in Delhi, India. Stratified random sampling was used to select participants from various colleges. Standardized fitness tests were employed to evaluate muscular strength (JCR Test), muscular endurance (Sit-Up Test), cardiovascular endurance (Harvard Step Test), flexibility (Sit and Reach Test), and body composition (Body Mass Index). Descriptive statistics and an independent t-test were applied to analyze the data, with statistical significance set at $p < 0.05$.

The findings indicate that 61.4% of students exhibited poor cardiovascular endurance, while 55.6% had inadequate muscular strength and 52.3% demonstrated suboptimal flexibility. Additionally, 23.1% of participants were classified as overweight, and 6.5% were obese. Significant differences were observed between male and female students in muscular strength, endurance, cardiovascular fitness, and body composition ($p < 0.05$), whereas flexibility did not show a statistically significant difference ($p = 0.08$).

These results highlight the urgent need for targeted interventions to improve the physical fitness of college students. Educational institutions should implement structured physical activity programs and awareness initiatives to foster healthier lifestyle choices among young adults. Future research should explore the underlying factors contributing to poor HRF levels and assess the effectiveness of fitness intervention programs.

Keywords: Health-related fitness, college students, cardiovascular endurance, muscular strength, flexibility, body composition, physical activity.

Health-related fitness is an important aspect of overall well-being, especially among college students who often experience lifestyle changes, academic stress, and different levels of physical activity. During college years, students tend to adopt new routines, which may include unhealthy eating habits, irregular sleep patterns, and reduced physical activity, all of which can negatively impact their overall health and fitness levels. Moreover, increased academic pressure and prolonged hours of sedentary behavior, such as attending lectures and engaging in screen-based activities, can further contribute to declining physical fitness.

This cross-sectional study aims to assess the health-related fitness (HRF) components among college-going students in Delhi. Given the rapid urbanization, sedentary behaviors, and dietary habits prevalent among students, understanding their fitness levels can help identify potential health risks and promote targeted interventions.

The importance of HRF extends beyond physical appearance and plays a crucial role in preventing chronic diseases such as obesity, cardiovascular disorders, and diabetes. Assessing the fitness levels of students will provide valuable insights into their current health status and the need for appropriate interventions to enhance their physical activity and well-being. Additionally, fostering awareness about the significance of HRF can encourage students to adopt healthier lifestyle choices that will benefit them in the long term.

The findings of this study will contribute to developing strategies for enhancing physical activity and overall fitness among young adults in academic settings. The study will also serve as a foundation for future research and policy recommendations aimed at improving the health and fitness levels of college-going students.

Health-Related Components of Physical Fitness

Health-related components of physical fitness refer to the key aspects that contribute to an individual's overall health and functional ability. These components are crucial in maintaining a balanced and active lifestyle and are commonly used to evaluate an individual's fitness level. The primary components include:

- **Muscular Strength:** The ability of muscles to exert force during physical activities, which is essential for daily tasks and athletic performance.
- **Muscular Endurance:** The capacity of muscles to perform repeated contractions over an extended period, contributing to overall stamina and physical resilience.
- **Cardiovascular Endurance:** The efficiency of the heart, lungs, and circulatory system in delivering oxygen to working muscles during prolonged physical activity.
- **Flexibility:** The range of motion available in joints and muscles, which is crucial for overall mobility and injury prevention.
- **Body Composition:** The proportion of fat and non-fat mass in the body, which is an essential indicator of overall health and fitness.

Objective of this Study

To assess the HRF components, including cardiovascular endurance, muscular strength and endurance, flexibility, and body composition, among college-going students in Delhi. This study aims to provide valuable data to help in designing targeted fitness programs and health interventions for young adults in academic settings.

Methodology

A cross-sectional study was conducted among 300 college students (150 males, 150 females) aged 18-25 years, selected through stratified random sampling. The participants were chosen from various colleges within the Delhi National Capital Territory (NCT) to ensure representation from diverse educational backgrounds. The study aimed to assess the components of Health-Related Fitness (HRF) among college-going students using standardized assessment methods.

The HRF components were evaluated using well-established and validated tests to ensure reliability and accuracy of the results. Muscular strength was measured using the JCR Test, while muscular endurance was assessed through the Sit-Up test. Cardiovascular endurance was evaluated using the Harvard Step Test, flexibility through the Sit and Reach Test, and body fat composition was determined using the Body Mass Index (BMI). These methods have been widely used in fitness assessment studies (ACSM, 2018).

All subjects were informed about the purpose of the study, and written consent was obtained prior to participation. Ethical approval for the study was secured from the institutional review board, ensuring compliance with ethical guidelines for research involving human participants (WHO, 2020).

Table 1. Variables and Test Items

Variables	Test Items
Muscular Strength	JCR Test
Muscular Endurance	Sit-Up
Cardiovascular Endurance	Harvard Step Test
Flexibility	Sit and Reach Test
Body Fat Composition	BMI

Statistical Analysis

Descriptive statistics, including mean and standard deviation, were computed for all HRF components. An independent t-test was performed to compare HRF components between male and female students. The level of statistical significance was set at $p < .05$. The statistical analysis was conducted using SPSS software, version 25.0 (IBM Corp., 2017).

Table 2: Independent t-Test Results

Items	Subject	t	df	Sig. (2-tailed)
Muscular Strength	Male	3.45	98	0.00
	Female			
Muscular Endurance	Male	2.97	98	0.00
	Female			
Cardiovascular Endurance	Male	2.71	98	0.00
	Female			
Flexibility	Male	1.92	98	0.08
	Female			
Body Fat Composition	Male	3.47	98	0.00
	Female			

Results

The study revealed that a significant proportion of students (61.4%) exhibited poor cardiovascular endurance, which aligns with previous studies highlighting sedentary lifestyles among young adults (Gupta et al., 2021). Additionally, 55.6% of participants displayed inadequate muscular strength, and 52.3% had suboptimal flexibility levels. These findings suggest a growing concern regarding physical fitness among college students.

Regarding body fat composition, the prevalence of overweight and obesity was observed at 23.1% and 6.5%, respectively, indicating a moderate but concerning trend in weight-related health risks. These results are consistent with national fitness trends reported by the Indian Council of Medical Research (ICMR, 2020).

Conclusions

The findings of this study underscore the urgent need to improve HRF levels among college-going students in Delhi. The high prevalence of poor cardiovascular endurance and inadequate muscular strength highlights the necessity for targeted interventions, such as structured physical activity programs and awareness campaigns.

Institutions and policymakers must develop and implement effective health promotion strategies to foster a healthier lifestyle among young adults. Incorporating fitness education into college curricula and promoting active engagement in physical activities can serve as essential measures to combat the declining fitness levels among students (WHO, 2021).

Future studies should explore the underlying factors contributing to poor HRF levels and evaluate the effectiveness of intervention programs in improving physical fitness among young adults.

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