

A COMPARATIVE STUDY OF PHYSICAL FITNESS AMONG RURAL AND URBAN DEGREE COLLEGE MEN IN DISTRICT PAURI -GADHWAL OF UTTARAKHAND

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Abstract:

The present study was undertaken to compare selected components of physical fitness between rural and urban degree college men of district Pauri-Gadhwali, Uttarakhand, India. A descriptive survey method was implemented, and a total of three hundred ($N = 300$) male students between the ages of 18 and 22 were chosen as subjects. The students were separated into two groups: one hundred fifty ($n = 150$) from degree colleges situated in rural blocks and one hundred fifty ($n = 150$) from degree colleges situated in urban areas of the district. Five components of the AAHPER Youth Fitness Test Battery were used to evaluate physical fitness: the 50-meter dash (speed), standing broad jump (explosive leg strength), sit-ups in sixty seconds (muscular endurance), sit-and-reach test (flexibility), and the 600-meter run/walk (cardio-respiratory endurance). Descriptive statistics (mean and standard deviation) and the independent-samples t -test were employed to analyze the collected data, with a significance level of 0.05. The results indicated that there were statistically significant differences between rural and urban college men in all five fitness variables. Rural students achieved superior scores in muscular endurance, cardio-respiratory endurance, and flexibility, as well as comparatively better performance in speed and explosive strength. These findings are in accordance with previous research conducted in other hilly and plain regions of India, which has generally attributed the fitness advantage of rural youth to their habitual physical activity, terrain-related walking, agricultural work, and comparatively lower dependence on mechanized transport and screen-based leisure (Gahlawat, 2010; Kumari et al., 2024). The study suggests that urban degree colleges in the district should enhance structured physical education programs, increase access to sports infrastructure, and

promote active commuting and outdoor recreation among students in order to reduce the observed fitness disparity.

Keywords: *physical fitness, rural, urban, degree college men, Garhwal, Uttarakhand, AAHPER test battery.*

1. Introduction

An individual's overall health status and functional capacity to execute daily activities efficiently, without undue fatigue, while retaining sufficient reserve energy for emergencies and leisure pursuits are widely regarded as fundamental indicators of physical fitness. Corbin and Le Masurier (2014) define it as a multidimensional construct that encompasses health-related components, including cardio-respiratory endurance, muscular strength, muscular endurance, flexibility, and body composition, as well as skill-related components, including speed, agility, power, balance, and coordination. In recent decades, rapid urbanisation, mechanisation of transport, and the growing presence of screen-based entertainment have contributed to increasingly sedentary lifestyles among young people, a trend that has been linked to a global rise in hypokinetic disorders and non-communicable diseases (Lee et al., 2012).

The coexistence of traditional, labor-intensive rural livelihoods and rapidly modernizing urban centers in India makes it a particularly intriguing context for examining the rural-urban fitness divide. The hilly Garhwal region of Uttarakhand, in particular, provides a unique environment in which rural populations continue to engage in agriculture, animal husbandry, and significant amounts of incidental walking over hilly terrain. In contrast, urban degree college students in towns such as Srinagar, Pauri, and Kotdwar increasingly rely on motorized transport, have easier access to processed food, and spend a greater portion of their leisure time on mobile phones, television, and computers. A recent large-scale school-based survey conducted among adolescents in the Garhwal division of Uttarakhand found that the health-related physical fitness of the sampled adolescents compared favourably with adolescents from other parts of India, while also noting that physical activity levels in the region were, on the whole, inadequate and required policy attention (Kumari et al., 2024).

Several studies conducted elsewhere in India have reported that rural students, whether at the school or college level, tend to outperform their urban counterparts on standard fitness test batteries, a pattern attributed to greater habitual physical activity, farm work, and walking rather

than structured exercise programmes (Gahlawat, 2010; Karak et al., 2022; Sanjaya &Awati, 2014). At the same time, urban students often benefit from organised sports coaching, gymnasium access, and better nutritional support, which can offset some of the activity-related disadvantages of urban living. Given these competing influences, and given that most existing Indian studies on this theme have focused on school-going children or on plains and coastal districts, there remains a clear need for focused research on degree college men, that is, young adults aged approximately 18 to 22 years, in a Himalayan district such as Garhwal, where terrain, occupational patterns, and lifestyle differ markedly from the plains. The present study was therefore designed to compare physical fitness between rural and urban degree college men of Garhwal district using a reasonably large and evenly balanced sample of 300 subjects.

2. Review of Related Literature

A substantial body of research has examined rural-urban differences in physical fitness among Indian school and college populations, and the overall pattern reported across this literature is broadly consistent, although the magnitude and specific components affected vary from region to region.

2.1 Studies Reporting Rural Superiority in Fitness

Gahlawat (2010) conducted a comparison of the physical fitness status of rural and urban male collegiate students in Kurukshetra, Haryana. The author concluded that rural students achieved significantly higher scores than urban students on a number of fitness parameters, which he attributed to the physically demanding nature of rural daily life. In the same vein, Sanjaya and Awati (2014) conducted a comparative analysis of physical fitness among rural and urban high school students, and they discovered that rural students outperformed their urban counterparts on tests of endurance and strength. A more recent study conducted in the Bankura district of West Bengal compared the cardiovascular, anthropometric, and muscular strength parameters of rural and urban school students. The results indicated that rural students demonstrated significantly superior performance in nearly all of the physical fitness variables that were assessed (Karak et al., 2022).Likewise, an investigation comparing health-related physical fitness among rural farmers and an urban sedentary group in Gulbarga district found that the rural group demonstrated superior fitness outcomes linked to their occupational physical activity (Patil et al., 2012).

A study conducted in the Bardiya district using the AAHPER Youth Fitness Test Battery on secondary school boys similarly reported meaningful differences between groups drawn from hilly and plain regions, noting that the fitness gap could be narrowed through greater inclusion of less-active groups in organised games and sports programmes (Journal of Durgalaxmi, 2025). Taken together, these studies suggest that habitual, occupation-linked physical activity, rather than structured exercise alone, is an important contributor to the fitness advantage frequently observed in rural populations across different Indian states.

2.2 Studies from the Himalayan and Hilly Region

Research that is specific to Uttarakhand is still relatively scarce, but it is expanding. Using a large sample and multistage stratified random sampling, Kumari et al. (2024) conducted a school-based cross-sectional survey among adolescents in government institutions in the Garhwal division, spanning classes 8 to 11. The authors reported that the health-related physical fitness of Garhwal adolescents compared favorably with other parts of the country, despite the fact that physical activity levels were generally low and were a significant predictor of fitness outcomes. They employed the Harvard step test, handgrip dynamometry, sit-and-reach test, and shoulder stretch test, among other measures. This finding is important for the present study because it establishes that the hilly terrain of Garhwal is associated with reasonably good baseline fitness, while simultaneously flagging that inactivity is nonetheless a concern requiring institutional attention, particularly among urban and semi-urban student populations within the same region.

2.3 Studies at the College and Young-Adult Level

At the college level, comparative work has also examined fitness differences by institutional and demographic categories. A study comparing physical fitness parameters between general college students and physical training college students found substantial differences attributable to structured training exposure (International Journal of Experimental Research and Review, 2016), underscoring the role of organised physical education in shaping fitness outcomes independent of rural or urban residence. Related work on health-related physical fitness among children attending municipal and international schools in Nasik city found that municipal school children, despite lower anthropometric averages, exhibited greater muscular strength and endurance and better flexibility than their more affluent counterparts (Bhakay& Vali, 2018), a pattern that parallels the

rural-urban findings reported elsewhere and reinforces the idea that habitual activity level, rather than institutional resource availability alone, drives fitness differences.

2.4 Theoretical and Public-Health Perspectives

From a public-health standpoint, physical inactivity has been identified as one of the leading modifiable risk factors for major non-communicable diseases worldwide, with estimates suggesting that eliminating physical inactivity could substantially reduce the global burden of several chronic conditions (Lee et al., 2012). Personality and psychosocial correlates of physical activity participation, including self-efficacy and perceived behavioural control, have also been shown to meaningfully predict exercise adherence (Rhodes & Smith, 2006), which is relevant when considering why urban students, despite potentially greater access to gymnasiums and organised sport, may still exhibit lower habitual activity levels than rural peers whose activity is embedded in daily routine rather than discretionary exercise. Corbin and Le Masurier (2014) provide the conceptual framework of health-related physical fitness used in the present study, while Biddle and Mutrie (2008) offer a psychological lens on why environment and habitual routine, more than intention alone, often determine long-term activity patterns.

In summary, the reviewed literature consistently points toward a rural fitness advantage rooted in occupational and incidental physical activity, tempered by the recognition that urban environments can offset this disadvantage where structured physical education and sporting infrastructure are genuinely accessible. However, very few of these studies have focused specifically on degree college men in a Himalayan district, and none, to the knowledge of the researcher, has done so using a sample as large and evenly balanced as the 300 subjects examined here. This gap provides the rationale for the present investigation.

3. Statement of the Problem

The problem for the present study was stated as follows: “A Comparative Study of Physical Fitness among Rural and Urban Degree College Men in District Pauri-Gadhwali of Uttarakhand.”

4. Objectives of the Study

The study was guided by the following objectives:

1. To assess and compare the speed of rural and urban degree college men using the 50-metre dash.
2. To assess and compare the explosive leg strength of rural and urban degree college men using the standing broad jump.
3. To assess and compare the muscular endurance of rural and urban degree college men using the sit-ups test.
4. To assess and compare the flexibility of rural and urban degree college men using the sit-and-reach test.
5. To assess and compare the cardio-respiratory endurance of rural and urban degree college men using the 600-metre run/walk.
6. To draw practical implications for physical education programming in rural and urban degree colleges of district Pauri-Gadhwali on the basis of the findings.

5. Hypotheses

On the basis of the objectives stated above, the following hypotheses were formulated for testing:

H01: There will be no significant difference between rural and urban degree college men on speed as measured by the 50-metre dash.

H02: There will be no significant difference between rural and urban degree college men on explosive leg strength as measured by the standing broad jump.

H03: There will be no significant difference between rural and urban degree college men on muscular endurance as measured by the sit-ups test.

H04: There will be no significant difference between rural and urban degree college men on flexibility as measured by the sit-and-reach test.

H05: There will be no significant difference between rural and urban degree college men on cardio-respiratory endurance as measured by the 600-metre run/walk.

Each null hypothesis was tested at the 0.05 level of significance.

6. Methodology

6.1 Research Design

The study employed a descriptive survey method involving a comparative, cross-sectional design, which is the design most commonly used in Indian physical education research of this type (Gahlawat, 2010; Karak et al., 2022).

6.2 Sample and Sampling Technique

A stratified random sampling procedure was employed to select a total of three hundred ($N = 300$) male students who were enrolled in undergraduate degree colleges in the Pauri-Gadhwali district of Uttarakhand. The sample was equally divided into two groups: one hundred fifty ($n = 150$) students were selected from degree colleges located in rural subdivisions of the district, and one hundred fifty ($n = 150$) students were selected from degree colleges located in urban areas of the district. The age of the subjects ranged from 18 to 22 years. Students who were diagnosed with any cardiac, orthopedic, or other medical condition that could potentially limit their ability to participate in physical performance tests were excluded from the sample.

6.3 Variables

The independent variable in the study was the area of domicile, which was categorized as either rural or urban. The five specified components of physical fitness—speed, explosive leg strength, muscular endurance, flexibility, and cardio-respiratory endurance—comprised the dependent variables.

6.4 Tools Used

Physical fitness was assessed using five test items adapted from the AAHPER Youth Fitness Test Battery, a widely used and validated instrument in comparable Indian studies (Journal of Durgalaxmi, 2025):

- (a) 50-metre dash — to measure speed, recorded in seconds.
- (b) Standing broad jump — to measure explosive leg strength, recorded in metres.
- (c) Sit-ups (60 seconds) — to measure abdominal muscular endurance, recorded as number of repetitions.

(d) Sit-and-reach test — to measure flexibility of the lower back and hamstrings, recorded in centimetres.

(e) 600-metre run/walk — to measure cardio-respiratory endurance, recorded in minutes and seconds (converted to seconds for analysis).

6.5 Procedure for Collection of Data

Permission was obtained from the principals of the designated degree colleges prior to data collection. An explanation of the study's objective was provided to the participants, and each participant provided informed consent. All tests were administered by the researcher with the assistance of trained physical education teachers, following a standard warm-up session of ten minutes. Tests were conducted on the college playground or sports field under similar environmental conditions across rural and urban centres, and each subject was given one familiarisation trial followed by the recorded test trial, in keeping with standard AAHPER test administration protocol.

6.6 Statistical Technique

Descriptive statistics, including the mean and standard deviation, were employed to analyze the data collected for both groups on each fitness variable. To test the hypotheses and examine whether the difference between rural and urban groups was statistically significant, an independent-samples t-test was applied to each variable, with the level of significance fixed at 0.05, consistent with the statistical procedure adopted in comparable studies (Gahlawat, 2010; Karak et al., 2022; Sanjaya & Awati, 2014).

7. Results and Discussion

The descriptive statistics (mean and standard deviation) for rural and urban degree college men on all five fitness variables are presented in Table 1, and the results of the independent-samples t-test are presented in Table 2.

Table 1: Descriptive Statistics of Physical Fitness Variables of Rural and Urban Degree College Men (N = 300)

Variable	Group	N	Mean	S.D.
50m Dash (sec)	Rural	150	7.42	0.51
	Urban	150	7.71	0.58
Standing Broad Jump (m)	Rural	150	2.14	0.19
	Urban	150	2.03	0.21
Sit-ups (reps/60s)	Rural	150	34.60	4.87
	Urban	150	30.85	5.12
Sit-and-Reach (cm)	Rural	150	18.75	3.42
	Urban	150	16.60	3.61
600m Run/Walk (sec)	Rural	150	132.40	9.65
	Urban	150	141.80	10.22

Table 2: Independent-Samples t-Test Comparing Rural and Urban Degree College Men on Physical Fitness Variables (df = 298)

Variable	Mean Difference	t-value	p-value	Significance (0.05)
50m Dash (sec)	0.29	4.62	0.000	Significant
Standing Broad Jump (m)	0.11	4.85	0.000	Significant
Sit-ups (reps/60s)	3.75	6.51	0.000	Significant
Sit-and-Reach (cm)	2.15	5.34	0.000	Significant
600m Run/Walk (sec)	9.40	8.24	0.000	Significant

7.1 Speed (50-metre Dash)

The mean 50-metre dash time for rural degree college men ($M = 7.42$ sec, $SD = 0.51$) was significantly lower, and therefore better, than that of urban degree college men ($M = 7.71$ sec, $SD = 0.58$), $t(298) = 4.62$, $p < 0.05$. The null hypothesis H_{01} was accordingly rejected. This finding is in broad agreement with earlier reports that rural students record faster sprint times than urban students, a pattern generally attributed to more frequent outdoor movement and less reliance on motorised transport in rural areas (Gahlawat, 2010).

7.2 Explosive Leg Strength (Standing Broad Jump)

Rural degree college men ($M = 2.14$ m, $SD = 0.19$) recorded significantly greater standing broad jump distances than urban degree college men ($M = 2.03$ m, $SD = 0.21$), $t(298) = 4.85$, $p < 0.05$, leading to rejection of H_{02} . Greater exposure to uneven, hilly terrain during daily walking and agricultural activity may plausibly contribute to stronger lower-limb musculature among rural

subjects, a mechanism consistent with observations from other hilly-region studies (Kumari et al., 2024).

7.3 Muscular Endurance (Sit-ups)

On the sit-ups test, rural subjects ($M = 34.60$, $SD = 4.87$) significantly outperformed urban subjects ($M = 30.85$, $SD = 5.12$), $t(298) = 6.51$, $p < 0.05$, and $H03$ was rejected. This result mirrors findings from Bankura district, where rural school students likewise recorded significantly higher abdominal muscular endurance scores than urban students (Karak et al., 2022), reinforcing the broader pattern of a rural fitness advantage in this component across different Indian regions.

7.4 Flexibility (Sit-and-Reach)

Rural degree college men ($M = 18.75$ cm, $SD = 3.42$) also demonstrated significantly greater flexibility than urban degree college men ($M = 16.60$ cm, $SD = 3.61$) on the sit-and-reach test, $t(298) = 5.34$, $p < 0.05$, resulting in rejection of $H04$. This is broadly consistent with the Garhwal adolescent survey, which likewise found flexibility to be a component sensitive to lifestyle and activity differences within the region (Kumari et al., 2024).

7.5 Cardio-respiratory Endurance (600-metre Run/Walk)

The largest between-group difference was observed for cardio-respiratory endurance: rural subjects completed the 600-metre run/walk in significantly less time ($M = 132.40$ sec, $SD = 9.65$) than urban subjects ($M = 141.80$ sec, $SD = 10.22$), $t(298) = 8.24$, $p < 0.05$, and $H05$ was rejected. This finding aligns with the broader public-health literature linking habitual physical activity to superior cardio-respiratory fitness and reduced risk of non-communicable disease (Lee et al., 2012), and suggests that the comparatively sedentary daily routines of urban degree college students in the district may already be manifesting as a measurable endurance disadvantage by young adulthood.

7.6 Overall Discussion

Across all five fitness components examined, rural degree college men of Garhwal district recorded significantly better scores than their urban counterparts. This overall pattern is highly consistent with the wider body of Indian research on rural-urban fitness comparisons, which has

repeatedly found rural students and young adults to be more physically fit across a range of settings, from Haryana (Gahlawat, 2010) and Karnataka (Sanjaya &Awati, 2014) to West Bengal (Karak et al., 2022) and the Terai belt of Nepal (Journal of Durgalaxmi, 2025). The most probable explanatory mechanism, which is echoed throughout this literature, is that rural daily life in a hilly district like Garhwal continues to embed substantial incidental physical activity. This includes walking on uneven terrain to reach colleges, participation in agricultural or household labor, and comparatively limited access to private motorized transport. Collectively, these factors promote higher habitual energy expenditure than the more sedentary, technology-mediated routines that are typical of urban college life.

At the same time, the findings should not be read as suggesting that urban degree colleges lack potential for fitness improvement. Rather, they point to an opportunity: because the fitness gap appears to be behavioural and environmental rather than fixed, structured physical education, accessible sports facilities, and active-commuting initiatives in urban colleges could meaningfully narrow the observed differences, a conclusion also drawn in studies comparing municipal and international school children, where institutional and habitual activity factors, rather than resource availability alone, appeared to drive fitness outcomes (Bhakay& Vali, 2018).

8. Major Findings

On the basis of the statistical analysis, the following major findings emerged from the study:

1. Rural degree college men were significantly faster than urban degree college men on the 50-metre dash ($p < 0.05$).
2. Rural degree college men demonstrated significantly greater explosive leg strength on the standing broad jump than urban degree college men ($p < 0.05$).
3. Rural degree college men showed significantly higher muscular endurance on the sit-ups test than urban degree college men ($p < 0.05$).
4. Rural degree college men were significantly more flexible on the sit-and-reach test than urban degree college men ($p < 0.05$).

5. Rural degree college men displayed significantly superior cardio-respiratory endurance on the 600-metre run/walk than urban degree college men, this being the largest observed difference among the five variables ($p < 0.05$).

6. All five null hypotheses (H01–H05) were rejected at the 0.05 level of significance.

9. Conclusions

The rural degree college men of district Pauri-Gadhwali possess significantly better overall physical fitness than urban degree college men across speed, explosive leg strength, muscular endurance, flexibility, and cardio-respiratory endurance. The consistency of this pattern across all five components, and its agreement with findings from other regions of India (Gahlawat, 2010; Karak et al., 2022; Sanjaya & Awati, 2014), lends confidence to the conclusion that area of residence, and the associated differences in habitual physical activity, meaningfully influences the physical fitness status of young adult men in this Himalayan district. At the same time, the region-specific survey evidence (Kumari et al., 2024) suggests that overall activity levels even in rural Garhwal remain below optimal, indicating that the observed rural advantage should be understood as relative rather than as evidence of adequate fitness in an absolute sense.

10. Recommendations

On the basis of the findings and conclusions of the study, the following recommendations are offered:

1. Urban degree colleges in district Pauri-Gadhwali district should strengthen compulsory physical education periods and provide structured fitness training to help narrow the observed rural-urban fitness gap.
2. Colleges, both rural and urban, should invest in accessible sports infrastructure, including playgrounds, running tracks, and basic gymnasium equipment.
3. Urban students should be encouraged to adopt active-commuting habits, such as walking or cycling to college where feasible, to compensate for reduced incidental activity.

4. Intercollegiate sports competitions and fitness assessment camps should be organised periodically to sustain student motivation for physical activity.
5. Comparative studies comparable to this one may be expanded to encompass female students, other age groups, and supplementary fitness and health-related variables, including psychological well-being and body composition.
6. Longitudinal studies should be conducted to determine whether the rural fitness advantage persists, narrows, or widens as rural areas of district Pauri-Gadhwali endure additional infrastructural development and lifestyle changes.

11. Delimitations and Limitations

11.1 Delimitations

1. The study was delimited to male students studying in degree colleges of district Pauri-Gadhwali district, Uttarakhand.
2. The sample was restricted to 300 subjects, with 150 of them being rural and 150 of them being urban, and in the age range of 18 to 22 years.
3. Five variables were used to define physical fitness: speed, muscular endurance, explosive limb strength, flexibility, and cardio-respiratory endurance.

11.2 Limitations

1. The study did not control for factors such as diet, sleep patterns, genetic predisposition, and prior sports training history, which may have influenced fitness scores. These factors were regarded as limitations.
2. The findings are limited to the geographical and socio-cultural context of district Pauri-Gadhwali and may not be generalisable to other regions without further research.

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