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Impact of socio-economic status on physical activity patterns in university students

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Abstract

This study investigates the impact of Socio-Economic Status (SES) on physical activity patterns among male students of the Department of Physical Education at Guru Nanak Dev University, Amritsar. SES, typically defined by income, education, and occupation, plays a significant role in determining access to resources and opportunities for physical activity, influencing lifestyle behaviors and health outcomes. The study employed a cross-sectional design, with 105 male students categorized into three SES groups: upper, middle, and lower. Physical activity levels were assessed using the Physical Activity Index, which evaluates frequency, intensity, and duration. The results indicate that students from lower SES backgrounds exhibit higher levels of sedentary behavior compared to their middle and upper SES peers, who demonstrate more active lifestyles. Statistical analysis using the Chi-Square and Likelihood Ratio tests revealed a significant association between SES and physical activity levels. These findings highlight the socio-economic disparities in physical activity participation, underscoring the need for targeted interventions that promote physical activity among students from lower SES backgrounds. The study contributes valuable insights into the relationship between socio-economic factors and physical activity in university settings, providing a foundation for future research and health promotion strategies.

Keywords: Socio-economic status, physical activity, university students, health disparities

Introduction

Socio-Economic Status (SES) has long been recognized as a crucial determinant of various health outcomes, including physical activity levels. SES is often defined by three primary factors: income, education, and occupation. These factors influence access to resources, opportunities for physical activity, and lifestyle choices (Pampel *et al.*, 2010) [8]. In recent years, the relationship between SES and physical activity has gained significant attention in the context of public health, as physical inactivity is a major risk factor for various chronic diseases such as obesity, cardiovascular diseases, and diabetes (Warburton *et al.*, 2006) [10].

A growing body of literature suggests that individuals from higher SES backgrounds tend to engage in higher levels of physical activity compared to those from lower SES backgrounds (Sallis *et al.*, 2000) [9]. This disparity is often attributed to differences in access to safe recreational spaces, health education, and financial resources that enable participation in organized sports and fitness activities (Kramer *et al.*, 2007) [7]. Conversely, individuals from lower SES groups are more likely to experience barriers to physical activity, including lack of time, unsafe environments, and limited financial resources (Gordon-Larsen *et al.*, 2006) [6].

Previous studies have found that socio-economic factors, particularly income and education, significantly impact the type, frequency, and intensity of physical activity (Biddle & Asare, 2011) [2]. For instance, a study by Chinn *et al.* (2012) [4] indicated that higher SES individuals are more likely to engage in moderate to vigorous physical activity, while those from lower SES groups are more prone to sedentary behaviors. Similarly, research by Basset *et al.* (2017) [1] highlights that educational attainment is closely linked to increased levels of physical activity, possibly due to greater awareness of its health benefits.

Despite the well-established association between SES and physical activity, there remains a need for more nuanced research that explores how different SES groups vary in their engagement with physical activity, particularly in university student populations. While many studies have focused on general population samples, fewer have specifically examined the

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relationship between SES and physical activity in academic settings (Brownson *et al.*, 2009) [3]. University students represent a unique group, as they experience significant lifestyle changes during their academic years, which can influence their physical activity levels (Deliens *et al.*, 2015) [5].

This study aims to investigate the relationship between socio-economic status and physical activity among male students of the Department of Physical Education at Guru Nanak Dev University, Amritsar. By examining the distribution of physical activity levels across different SES categories, this research seeks to provide valuable insights into how socio-economic factors influence students' participation in physical activity. Understanding these relationships can inform interventions aimed at promoting physical activity and improving health outcomes for students across different SES backgrounds.

Selection of subjects

A total of 105 male students from the Department of Physical Education were selected as subjects for the study.

Selection of variables

The variables for the present study were selected based on their relevance to the research objectives and existing literature. The key variables considered are as follows:

1. Socio-Economic Status (SES)

SES is categorized into three levels based on income, education, and occupation:

- **Upper:** High-income, high education, and high-status occupation.
- **Middle:** Moderate income, education, and occupation.
- **Lower:** Low income, low education, and low-status occupation.

2. Physical activity

Physical activity was assessed across three dimensions:

- **Frequency:** The number of times physical activity is performed within a specified time period.
- **Intensity:** The level of effort required during physical activity, categorized as low, moderate, or vigorous.
- **Duration:** The total time spent engaged in physical activity during each session.

Selection of tools

The following tools were utilized to gather data for the present study:

1. Socioeconomic Scale (SES scale)

The SES Scale developed by Kuppaswamy (1976) and updated in 2023 was used to assess the socio-economic status of the participants. This scale evaluates three key indicators: the educational level and occupation of the head of the family, as well as the family's monthly income. The updated version incorporates contemporary socio-economic parameters for a more accurate classification.

2. Physical activity index

The Physical Activity Index, as proposed by Mayfield (2006), was used to measure the physical activity levels of the selected subjects. This index evaluates the frequency, intensity, and duration of physical activities to provide a comprehensive score reflecting the participants' physical activity levels.

Administration of the tests and data collection

1. Socio-Economic Status Scale (SESS)

The Socio-Economic Status Scale (SES), originally developed by Kuppaswamy in 1976 and revised in 2023, was utilized to assess three key indicators of socio-economic status: the monthly income of the family, the education level of the head of the household, and the occupation of the head of the household. The scale is divided into three components, as outlined below:

Table 1: Corresponding item numbers of the socio-economic status scale

Part - A	Education Score
Part - B	Occupation Score
Part - C	Monthly family income

Table 2: Scoring of the socio-economic status scale

S. No.	Scores	Socio-economic class
1	≥ 20	Upper
2	10-19	Middle
3	< 10	Lower

Physical activity

The Physical Activity Index developed by Mayfield (2006) was employed to evaluate the physical activity levels of the participants. This index is based on three dimensions of physical activity: frequency, duration, and intensity. The scores for each of these components are multiplied to obtain the overall activity index.

Formula

Activity Index = (Frequency) \times (Duration) \times (Intensity)

Table 3: Scoring for physical activity index

Activity index	Activity level
< 15	Sedentary
15 - 24	Low active
25 - 40	Moderate active
41 - 60	Active
> 60	High active

Study design

The present study employs a cross-sectional design, which allows for the collection of data at a single point in time. The study focuses on male students from the Department of Physical Education at Guru Nanak Dev University, Amritsar. The cross-sectional approach is particularly suited for assessing the relationship between socio-economic status, physical activity, and other variables, providing a snapshot of the population under investigation.

Statistical techniques

- **Chi-square test:** This test was used to analyze the associations between categorical variables. It is particularly effective for examining relationships and differences within contingency tables, such as those involving Socio-Economic Status (SES) groups (low, middle, and high). The Chi-Square test helps determine whether there are significant differences or dependencies between the categorical variables.
- **SPSS version 27:** All statistical analyses were performed using SPSS 27 (Pallant, 2020). The software was employed to conduct descriptive and inferential analyses, including the Chi-Square test and other relevant tests.

The significance level for all hypothesis tests was set at $p < 0.05$, indicating that results with p-values less than 0.05 were considered statistically significant.

Results

The crosstabulation presents the distribution of physical activity (PA) levels across different socio-economic status (SES) groups (Lower, Middle, and Upper). The table provides the count of students in each combination of SES and physical activity level (Active, Highly Active, Low Active, Moderate Active, and Sedentary):

Table 4: SES and Physical Activity (PA) crosstabulation

		Count					Total
		Physical activity					
		Active	High active	Low active	Moderate active	Sedentary	
SES	Lower	4	11	6	6	24	51
	Middle	6	15	3	1	8	33
	Upper	4	9	0	1	7	21
Total		14	35	9	8	39	105

- Lower SES group has the highest number of students in the "Sedentary" category (24 out of 51), indicating a higher proportion of inactivity in this group.
- Middle SES group has a more balanced distribution, with 15 students categorized as "High Active" and relatively fewer in the "Sedentary" category.
- Upper SES group shows fewer students overall, and there is a noticeable absence of students in the "Low Active" and "Moderate Active" categories. Most students are in the "Active" and "High Active" categories.

The Chi-Square test results help determine whether there is a statistically significant association between SES and physical activity levels.

Table 5: Chi-square tests

	Value	df	Asymptotic significance (2-sided)
Pearson chi-square	14.008 ^a	8	.082
Likelihood ratio	16.180	8	.040
N of valid cases	105		

- The Pearson Chi-Square test yields a value of 14.008 with a p-value of 0.082. Since the p-value is greater than the significance level of 0.05, we fail to reject the null hypothesis and conclude that there is no statistically significant association between SES and physical activity.
- However, the Likelihood Ratio test produces a p-value of 0.040, which is less than 0.05. This suggests that there is a significant association between SES and physical activity, though the results are somewhat inconsistent between the two tests.

Conclusions

- The Pearson Chi-Square test does not show a statistically significant relationship between SES and physical activity ($p = 0.082$), while the Likelihood Ratio test indicates a significant association ($p = 0.040$). This discrepancy could be attributed to the small, expected frequencies in several cells, which may impact the validity of the Chi-Square tests.

- Overall, while the data suggests a potential relationship between socio-economic status and physical activity, the findings should be interpreted with caution due to the limitations of the Chi-Square test in this case.

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