

*Original Article*

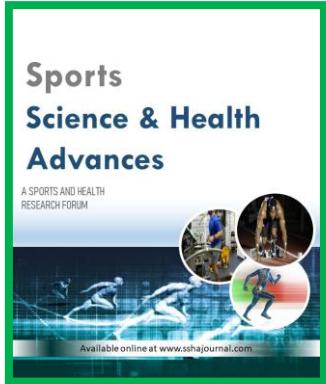
# Achievement Motivation and Attitude Towards Physical Education Among Undergraduate Students in Punjab: A Comparative Analysis Across Locale and Institution Type

Ranjit Kumar<sup>ID1\*</sup>, Amarjit Kaur<sup>ID2</sup>

<sup>1</sup>Research Scholar, Department of Physical Education, Panjab University, Chandigarh, India

<sup>2</sup>Professor in Physical Education at GNC Narangwal Ludhiana, Punjab, India

\*Correspondence: san.ranjit77@gmail.com



Peer-Reviewed  
Refereed  
Indexed



**How to cite:** Kumar, R., Kaur, A. (2025). Achievement Motivation and Attitude Towards Physical Education Among Undergraduate Students in Punjab: A Comparative Analysis Across Locale and Institution Type. *Sports Science & Health Advances*, 3(2), 522-529. <https://doi.org/10.60081/SSHA.3.2.2025.522-529>

**Received: 24-09-2025**  
**Accepted: 13-10-2025**  
**Published: 30-12-2025**



**Copyright:** This work is licensed under a Creative Commons Attribution 4.0 International License

## Abstract

**Purpose:** This study explored the interrelationship between achievement motivation and attitudes towards physical education among undergraduate students who were enrolled in government and private colleges located in rural and urban areas of Punjab.

**Material and Methods:** By utilizing standardized psychological tools, this research included a sample of 560 undergraduate students selected through random sampling from colleges affiliated with Guru Nanak Dev University, Amritsar, Punjab. Quantitative analyses were used to do the analysis i.e. including descriptive analysis, t-tests and Pearson correlation.

**Results:** The results revealed that no significant difference in achievement motivation across demographic groups but found significant differences in attitudes towards physical education based on college type and location. A moderate positive correlation was found between achievement motivation and attitude towards physical education.

**Conclusion:** The research findings highlighted the role of contextual and institutional factors in shaping students' attitude towards physical education and motivation for academic success which remained relatively uniform across the demographic variables. Implications for educational policy and curriculum integration are discussed in this research.

**Keywords:** Achievement motivation, physical education, undergraduate students, Punjab, rural-urban, government-private institution

## Introduction

In the landscape of higher education, achievement motivation and attitudes toward Physical Education (PE) are increasingly recognized as important concepts for students' holistic development. This includes students of every stage i.e. primary, secondary and higher education student. As Achievement motivation refers to the internal drive for individuals to set, strive for, and attain competence, often in relation to personally meaningful standards of excellence (Atkinson, 1964; McClelland, 1953). On the other hand, Attitude toward physical education encompasses students' affective, cognitive, and behavioral orientations to Physical education which includes enjoyment, perceived benefits, perceived barriers, and the value placed on PE

within the educational curriculum and in life more broadly and specifically for students of any age group.

Also, the importance of achievement motivation lies in its strong association with academic performance, persistence in challenging tasks, self-regulation, and ultimately long-term outcomes such as employability and life satisfaction (Schunk, Pintrich & Meece, 2008). Previous research also indicated that motivated students are more likely to engage actively in learning, aspire for opportunities for growth, and persist despite setbacks in their academics or in their personal life also (OECD, 2013). In parallel, positive attitudes toward physical education also contribute to better participation in physical activity, better physical health, and favorable psychosocial outcomes i.e. self-esteem, mental health, which cumulatively enhance academic success and general well-being (Sallis et al., 2012; Lubans et al., 2016).

From a global research point of view, previous studies have shown that both achievement motivation and attitudes toward Physical education can vary significantly across demographic, cultural, institutional, and geographic contexts. As a recent study by Cao et al. (2025) in China found a moderate positive correlation i.e.,  $r = 0.46$ , between attitude towards physical exercise and achievement motivation among college students with self-efficacy and life satisfaction acting as key mediators in this study. This finding suggests not only that student who are more physically active tend to be more motivated academically, but also these students perform better in psychological and affective variables play an important role. Similarly, research in Malaysia has examined the relationship between students' motivation and their academic achievement in PE subjects; while motivation tends to have a positive influence, some studies report non-significant relationships depending on context and measurement (Baharuddin & Wan Ahmad Munsif, 2023).

Focusing on attitude toward PE, empirical evidence from India and comparable contexts indicates mixed but enlightening findings. Shirotriya & Kapri (2023) in their seminal work, "The School Student's Attitudes towards Physical Education: Findings from India" examined students aged 11–19 in grades 10–12 and concluded that overall attitudes were "satisfied," but that students' attitudes were particularly influenced by factors such as the behavior of the PE teacher and learning/enjoyment in the class. Cultural norms, infrastructure, teacher competence, and curricular emphasis were highlighted as important. In other international settings, such as the Philippines, studies indicate that students with better attitudes toward PE tend to perform better academically in PE, though teacher behavior, curriculum design, and availability of resources may moderate this link.

The interplay between achievement motivation and attitude toward PE is theoretically supported by self-determination theory (Deci & Ryan, 2000), expectancy-value theory (Eccles & Wigfield, 2002), and achievement goal theory. These theories suggest that when students value a domain, expect success, feel competent, and experience autonomy, they are likely to show both higher motivation and more positive attitudes. In PE settings, the role of teacher support, quality of facilities, curriculum relevance, and social/personal value ascribed to physical health can all shape these psychological constructs (Standage et al., 2003).

In India, higher education is undergoing reform aligning with broader goals of holistic development, especially under policies like the National Education Policy (NEP) 2020. These concerns not just the intellectual dimensions of education but also physical, mental, emotional, and social health. However, despite policy impetus, there remains a paucity of rigorous empirical work examining how college/university students in India differ in their levels of achievement motivation and their attitudes towards PE especially when considering institutional type (government vs. private) and geographic locale (rural vs. urban). Previous studies conducted in secondary schools are more frequent (e.g., attitudes among grades 10-12), but the undergraduate context remains comparatively under-analyzed.

Moreover, demographic factors such as urban-rural residence, and type of institution can influence both achievement motivation and PE attitudes. As research in various countries indicates that urban students often have better access to PE facilities and

extracurricular physical activities, which may enhance their attitudes, whereas rural students may confront infrastructural or cultural limitations. Gender differences often emerge i.e. male students reported more favorable attitudes toward Physical Education or higher motivation in physical activity contexts. Even though findings are not always consistent, particularly in conservative or resource-limited settings ([Baharuddin & Wan Ahmad Munsif, 2023](#); [Shirotriya & Kapri, 2023](#)). Institutional type i.e., government vs private may also reflect differences in resource allocation, teacher quality, curricular emphasis, and student socio-economic background, all of which could differentially shape students' motivational levels and attitudes.

So as per the above discussion, very few studies directly compared government vs private college students, or rural vs urban, with respect to both achievement motivation and attitude toward PE in the Indian undergraduate context. While motivation and attitude are each separately studied, even then there is less work examining their interrelationship in PE contexts as it includes how much attitude toward PE predicts or correlates with achievement motivation, and vice versa. **Previous literature** does not fully account for how variables such as institutional type and geographic location might moderate the links between motivation and attitudes.

This study aims to address these above gaps by investigating achievement motivation and attitudes toward physical education among undergraduate students in Punjab by comparing across institutional type i.e., government vs private, geographic locale i.e., rural vs urban. By using standardized measurement tools i.e., the Deo-Mohan Achievement Motivation Scale and standardized Attitude Towards Physical Education. So, this study seeks to analyze achievement motivation, attitude toward PE, differences by demographic and institutional variables, and the relationship between these two constructs.

In doing so, the present study aligns with findings of the research conducted by [Cao et al., 2025](#) and [Baharuddin & Wan Ahmad Munsif, 2023](#), and also contributes new evidence for the Indian undergraduate context. Also, this focus is timely, given the policy environment (NEP 2020) emphasizing holistic student development, and practical, given that attitudes toward PE may affect students' physical activity levels, health outcomes, and by extension, academic engagement and psychosocial well-being.

### Review of Related Literature

Achievement motivation and attitude toward physical education are two significant psychological constructs that influence the overall development of students in academic and co-curricular domains. With the evolving emphasis on holistic education under policies like India's National Education Policy ([NEP 2020](#)), it becomes imperative to understand how demographic variables such as geographic locale and institutional type influence these variables, particularly among undergraduate students. Despite their importance, integrated studies examining these variables collectively remain limited in the Indian context.

As Achievement motivation, as conceptualized by [McClelland \(1961\)](#) and [Atkinson \(1964\)](#), refers to an individual's persistent drive to accomplish goals, often in competitive settings. In the Indian educational context, this construct has been widely studied at the secondary level, but undergraduate-specific research is less common. In a recent study by [Ansary \(2023\)](#) in West Bengal revealed a positive correlation between achievement motivation and academic achievement among higher secondary students, but found no significant differences in motivation based on gender or rural–urban locale.

Similarly, a study by [Sheikh \(2022\)](#) on adolescents in Kathua (Jammu & Kashmir), using the Deo Mohan Achievement Motivation Scale, highlighted the role of individual and contextual factors but found minimal demographic variance.

These findings suggest that while motivation positively correlates with academic success, demographic determinants like locale and gender might not consistently influence motivational levels.

**On the other hand**, Attitudes toward physical education (PE) encompass cognitive, affective, and behavioral responses toward PE classes and physical activity in general. In India, attitudes toward PE are influenced by multiple factors including curriculum design, teacher competence, infrastructure, and institutional support. [Debbarma and Devi \(2024\)](#)

conducted a study in Tripura and reported that **urban higher secondary girls held significantly more positive attitudes** toward PE programs compared to their rural counterparts, largely due to better access to facilities and teacher support

Similarly, a study conducted in Haveri district of Karnataka found that urban male students demonstrated significantly more favorable attitudes toward PE and sports than rural students (Rathod & Shinde, 2015). It concluded that these findings consistently indicate that **geographic locale plays a considerable role**, with urban students often having more favorable perceptions of PE due to better exposure, encouragement, and infrastructure.

While research on locale differences in attitude toward PE showed clear differences, findings regarding achievement motivation across rural and urban settings are more ambiguous. As a study in West Bengal by Ansary (2023) reported no significant rural-urban difference in achievement motivation. On the other hand, PE attitude studies have repeatedly shown that rural students tend to have less favorable views towards physical activity programs. The reasons can be fewer extracurricular opportunities, lack of specialized PE teachers, and lesser emphasis on holistic health education in rural higher education institutions.

**As it is evident in the Indian context that** Institutional type is another critical variable influencing student psychology. Even though limited, existing studies suggested that students in private institutions generally demonstrate more positive attitudes toward physical wellness initiatives. Singh and Chakradhara (2017), in a study on yoga attitudes among PE students, found **significantly higher positive attitudes** among private school students compared to government school counterparts

On the other hand, studies focusing on achievement motivation show less consistent patterns. Government and private college students often report similar motivation levels, suggesting that **motivation may be more intrinsic** and less affected by institutional type than attitudes are. However, some differences may stem from varying levels of academic pressure, availability of physical activity infrastructure, or the broader institutional ethos.

**So, the** existing literature suggests a pattern and **achievement motivation** appeared relatively stable across demographic categories, **attitudes toward physical education** vary significantly by **locale and institutional type**. Urban students and those in private institutions generally show more favorable attitudes. However, few Indian studies have explored the **interrelationship** between achievement motivation and PE attitude, particularly at the undergraduate level. Most research has focused either on school-aged populations or isolated variables. There is also a gap in literature that applies **psychometric tools/scales** (like the Deo-Mohan Scale or Thakur's Attitude toward PE Scale) to comparative studies within Indian higher education context.

This study, therefore, addresses a critical gap by exploring how achievement motivation and attitudes toward PE vary and interact across locale and institutional types among undergraduate students in Punjab. It means that this study contributes to both theoretical understanding and practical policy, specifically in the context of NEP 2020's call for integrating physical wellness into the academic curriculum.

#### ***Objectives of the Study:***

Based on the above review of literature, following were the objectives decided by the researcher for this present study:

1. To analyze achievement motivation among undergraduate students across urban and rural colleges.
2. To examine attitudes towards physical education across urban and rural colleges.
3. To compare achievement motivation among students in government and private colleges.
4. To assess attitudes towards physical education among government and private college students.
5. To examine the relationship between achievement motivation and attitudes towards physical education.

**Hypotheses:**

- $H0_1$ : There is no significant difference in achievement motivation between urban and rural college students.
- $H0_2$ : There is no significant difference in attitudes towards physical education between urban and rural college students.
- $H0_3$ : There is no significant difference in achievement motivation between government and private college students.
- $H0_4$ : There is no significant difference in attitudes towards physical education between government and private college students.
- $H0_5$ : There is no significant correlation between achievement motivation and attitudes towards physical education.

**Methodology**

This study employed a descriptive cum comparative design to examine achievement motivation and attitude toward physical education among undergraduate students. A sample of 560 students was selected through systematic random sampling from government and private colleges affiliated with Guru Nanak Dev University, Amritsar. During data collection, researchers took proper permission at university as well as affiliated college. During rapport building, researchers informed the students the purpose and objectives of this study. The participants were promised confidentiality and only after their consent was received, they were allowed to participate in the research. Two standardized tools were used i.e. the *Deo-Mohan Achievement Motivation Scale* (1985) which consisted of 50 items across 15 dimensions with 0.67 to 0.78 reliability coefficient and the *Attitude Toward Physical Education Scale* by *G.P. Thakur and Manju Thakur* (1978) which consist of 16 Likert-type items with reliability coefficients i.e., 0.78 for Split half and 0.72 for test-retest reliability. Data were analyzed using descriptive statistics, t-tests, and Pearson correlation to find group differences and interrelationships between the variables. Jamovi software was used for the data analysis.

**Results**

The results of the study are presented in three ways: demographic profile, descriptive analysis, and inferential statistics. The sample of 560 undergraduate students included 51.6% males and 48.4% females which reflected an almost equal representation of both the genders. Between government (48%) and private (52%) colleges and between rural (48.8%) and urban (51.2%) locales. This balanced data distribution represents allows for generalizability across different demographic backgrounds.

**Table 1** Descriptive Statistics

Variable	N	Mean	Median	SD	Skewness	Kurtosis
Achievement Motivation	560	61.6	62	11.42	0.007	-0.532
Attitude Towards Physical Education	560	65.4	66	6.96	0.008	-0.464

Descriptive analysis (see Table 1) shows that the mean score of achievement motivation among students was 61.6 and SD = 11.42 which indicates a moderate level of achievement motivation. The distribution was close to normal with Skewness = 0.007 and suggests data suitability for parametric testing. Similarly, the mean score for attitude towards physical education was 65.4 with SD = 6.96 and also normally distributed with Skewness = 0.008 which imply overall favorable student attitudes toward physical education.

Further descriptive analysis by locale revealed differences in achievement motivation between rural with  $M = 61.7$  and urban students with  $M = 61.5$ . But rural students showed more favorable attitudes towards PE with  $M = 67.0$  vs. 63.9. Similar patterns were observed when comparing institutional type i.e., both government and private students reported similar achievement motivation scores even though while private students demonstrated marginally more favorable attitudes towards PE with  $M = 66.0$  vs. 64.8.

Under Inferential analysis (Table 2) by using independent sample t-tests showed no statistically significant difference in achievement motivation between rural and urban

students with  $t = 0.256$ ,  $p = 0.798$  and between government and private college students with  $t = -0.547$ ,  $p = 0.584$ . However, there are significant differences showed in attitudes toward physical education. Rural students held significantly more positive attitudes than their urban students with  $t = 5.458$ ,  $p < .001$ . A marginally significant difference was observed between private and government students' PE attitudes with  $t = -1.993$ ,  $p = 0.047$  which favor private institutions in this context. Effect size of each comparison highlighted the practical significance of the statistical results.

Finally, Pearson correlation analysis (Table 3) revealed a moderate and statistically significant positive relationship with  $r = 0.532$ ,  $p < .001$ , between achievement motivation and attitude toward physical education. This result suggests that students with higher achievement motivation are more likely to hold positive attitudes towards physical education which in turn reinforces the argument that achievement motivation and attitude towards physical education are interlinked and mutually reinforcing each other in the context of higher education students of Punjab.

These results validate previous literature showing that contextual factors like institutional type and locale influence students' attitudes toward physical education, while intrinsic achievement motivation tends to remain relatively stable across demographic groups.

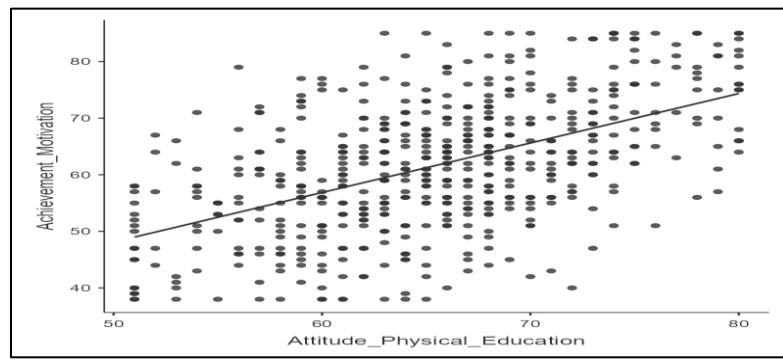
**Table 2** Comparison analysis, 't' test results

Variable	Comparison	N	Mean	S.D.	t-Value	p-Value	ES
Achievement Motivation	Government	269	61.3	11.12	-0.547	0.584	0.044
	Private	291	61.8	11.71			
Attitude Physical Education	Government	269	64.8	7.13	-1.993	0.047	0.173
	Private	291	66	6.75			
Achievement Motivation	Rural	273	61.7	11.56	0.256	0.798	0.017
	Urban	287	61.5	11.31			
Attitude Physical Education	Rural	273	67	6.81	5.458	<.001	0.457
	Urban	287	63.9	6.76			

ES = Effect Size (Cohen's d)

**Table 3** Correlation analysis i.e., r value

Relationship	r value	p-value	Inference/Result
AM vs PE Attitude (Correlation)	0.532	< .001	Significant



**Figure 1** Scatterplot for relationship between Attitude towards Physical Education and Achievement Motivation

### Discussion

This study investigated the relationship between achievement motivation of undergraduate students of Punjab and their attitude toward physical education by

considering differences at institutional level i.e., government vs private and locale i.e. urban vs rural.

The findings demonstrated that achievement motivation remained overall consistent across all subgroups. This finding indicated its intrinsic and relatively stable nature across these demographic variables. This finding is in line with theoretical foundations by [McClelland \(1961\)](#) and [Atkinson \(1964\)](#). This suggests that motivation is generally dependent on internal drives and personal goals than on external institutional or geographic variables.

On the other hand, attitudes toward physical education varied notably. Rural college students and those from private institutions reported more favourable attitude toward physical education. This finding aligns with previous research studies i.e. [Debbarma & Devi, 2024](#), which showed that such differences among students due to infrastructural resources, quality of teacher training, and the nature of co-curricular opportunities. But in the present study, rural students have better attitude towards physical education than urban students, Punjab's rural background and the activities involved in the rural life could be one of the main reasons of this finding. Along with, popularity of rural based games such as Kabaddi, wrestling and rural games nurtures an environment which is favourable towards physical education.

An important outcome of this study was the significant positive correlation i.e.  $r = 0.532$ ,  $p < .001$ , between achievement motivation and attitudes toward physical education of undergraduate students. This finding supports Self-Determination Theory by [Deci & Ryan, 2000](#). This theory arguments that intrinsic motivation in one aspect of the personality that can positively influence others when autonomy, competence, and relatedness are supported. In the context of Punjab, this result highlights the importance of physical education in terms of students' attitude towards physical education and their achievement motivation. As Punjab, India which was once a leading state of India in terms of sports and its regional inclination towards physical strength activities, this study's results can help higher education institutions to encourage and plan their curriculum to nurture attitude towards physical education and motivation among college students.

As the study is limited by its scope in terms of demographic variables i.e. colleges affiliated with Guru Nanak Dev University, and its dependence on self-report measures. This study also highlights the importance of integrating academic and physical development which is also echoed NEP 2020's vision for holistic education in India.

### Conclusion:

The educational institutions and policymakers need to adopt **integrated approaches** to curriculum design that merge academic goals with physical and emotional development. NEP 2020, India also emphasizes such holistic education, and this study empirically supports that direction for the students. The study adds meaningful findings to the limited Indian contextual research in linking achievement motivation with physical education attitudes. It also raises important questions about the **institutional and geographic locations** that shape students' holistic development.

### Conflict of Interest:

None

### ORCID

Ranjit Kumar  <https://orcid.org/0009-0008-7893-1928>

Amarjit Kaur  <https://orcid.org/0009-0009-9352-0884>

### References

Atherton, O. E., Grijalva, E., & Robins, R. W. (2023). Personality traits across rural and urban contexts. *Journal of Research in Personality*, 105, 104359.

Atkinson, J. W. (1964). *An Introduction to Motivation\**. Princeton, NJ: Van Nostrand.

Baharuddin, H., & Wan Ahmad Munsif, W. A. M. (2023). The Relationship Between Student Motivation Level and Achievement in Physical Education (Secondary school context, Malaysia). *International Journal of Advanced Research and Publications*.

Bama, R. & Muktamath, J. (2023). Personality traits and achievement motivation among college students: A comparative study. *Indian Journal of Psychology and Education*, 13(2), 45–53.

Cao, L., Yu, Q., Feng, X., Wang, L., & Lang, J. (2025). The influence of physical exercise on achievement motivation among college students: the mediating roles of self-efficacy and life satisfaction. *Frontiers in Psychology*.

Debbarma, D., & Devi, B. (2024). Attitude towards higher secondary physical education program: A comparative study. *Journal of Human Sport and Exercise*, 19(1), 102–110.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268.

Deo, P., & Mohan, A. (1985). Achievement Motivation Scale\*. National Psychological Corporation.

Eccles, J., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual Review of Psychology*.

Kilpatrick, M., Hebert, E., & Bartholomew, J. (2020). College students' motivation for physical activity. *Journal of American College Health*, 52(2), 87–94.

López-Campos, G. H., et al. (2023). Motivation and attitudes towards physical activity in university students. *European Physical Education Review*, 29(1), 33–47.

López-Campos, G. H., et al. (2023). Motivation and attitudes towards physical activity in university students. *European Physical Education Review*, 29(1), 33–47.

Lubans, D. R., Richards, J., Hillman, C. H., Faulkner, G., Beauchamp, M. R., Nilsson, M., ... & Biddle, S. J. H. (2016). Physical activity for cognitive and mental health in youth: A systematic review of mechanisms. *Pediatrics*, 138(3), e20161642. <https://doi.org/10.1542/peds.2016-1642>

Ntoumanis, N. (2005). A prospective study of participation in optional school physical education using a self-determination theory framework. *Journal of Educational Psychology*, 97(3), 444.

Ntoumanis, N. (2005). A self-determination approach to the understanding of motivation in physical education. *British Journal of Educational Psychology*, 75(2), 225–242.

OECD. (2013). PISA 2012 Results: Ready to Learn: Students' Engagement, Drive and Self-Beliefs (Volume III). OECD Publishing. <https://doi.org/10.1787/9789264201170-e>

Rathod, N. R., & Shinde, S. K. (2015). Attitudes of rural and urban high school students towards physical education and sports. *International Journal of Physical Education, Sports and Health*, 1(3), 27–30.

Sallis, J. F., et al. (2012). Physical activity in youth: The role of schools. *The Lancet*, 380(9838), 373–384.

Sari, S. et al. (2023). Gender differences in achievement motivation among high school students. *International Journal of Education and Learning*, 5(1), 23–30.

Schmitt, D. P., Reale, A., Voracek, M., & Allik, J. (2008). Why can't a man be more like a woman? Sex differences in Big Five personality traits across 55 cultures. *Journal of Personality and Social Psychology*, 94(1), 168–182.

Schunk, D. H., Pintrich, P. R., & Meece, J. L. (2008). Motivation in education: Theory, research, and applications. Pearson.

Shirotriya, A. K., & Kapri, B. C. (2023). The School Student's Attitudes toward Physical Education: Findings from India. *SSHA Journal*.

Singh, A., & Chakradhara, R. (2017). A comparative study on the attitude of secondary school students towards yoga education in government and private schools. *International Journal of Yoga, Physiotherapy and Physical Education*, 2(2), 30–33.

Soini, M., Liukkonen, J., & Jaakkola, T. (2014). Motivational climate and students' emotional experiences and effort in physical education. *Journal of Educational Research*, 107(5), 324–336.

Standage, M., Duda, J. L., & Ntoumanis, N. (2003). A model of contextual motivation in physical education: Using constructs from self-determination and achievement goal theories. *Journal of Educational Psychology*, 95(1), 97–110.

Standage, M., Duda, J. L., & Ntoumanis, N. (2003). A model of contextual motivation in physical education: Using constructs from self-determination and achievement goal theories. *Journal of Educational Psychology*.

Thakur, G. P., & Thakur, M. (1978). Attitude Towards Physical Education Scale. Patna: Bihar Psychological Corporation.

Ullah, I., et al. (2020). Achievement motivation among university students: Gender differences. *Asian Journal of Social Sciences & Humanities*, 9(3), 73–80.