

Google Scholar



scopus

Impact factor 6.2

Geoscience Journal

ISSN:1000-8527

Indexing:

- » Scopus
- » Google Scholar
- » DOI, Zenodo
- » Open Access

 www.geoscience.ac



Registered

Regional Differences in Student Attitudes Toward Physical Fitness, Fundamental Game Skills, Physical Education, and Leisure-Time Activity: A Comparative Study of Punjab, Rajasthan, and Jammu & Kashmir

Dr. Amarjeet Singh

Professor, Department of Physical Education and Sports, Sant Baba Bhag Singh University, Padhiana, Jalandhar, Punjab, India

Abstract

Background: In India, school-age children encounter a wide range of environmental, cultural, and infrastructure factors that may influence their perspectives on physical education (PE) and physical activity. There is still a lack of comparative, region-sensitive evidence.

Purpose: The goal is to investigate and contrast the general attitudes of school children in Punjab, Rajasthan, and Jammu & Kashmir (J&K) regarding four important areas of physical education viz. physical fitness, basic game skills, attitude toward PE classes, and leisure-time physical activity (LTPA).

Methods: After completing a three-month training program, 72 final-year B.P.Ed. student-teachers implemented standardized physical education instructional units in government and private schools that were purposefully chosen throughout the three states. The Post-Physical Education Program Training Questionnaire (12 Likert-scaled items; 4 domains) was filled out by students in Grades 8–10 (N=270; 30 per state per comparison group; balanced urban/rural mix). Instrument content validity was established by expert review; internal consistency reliability exceeded $\alpha=0.80$. Independent-samples *t* tests examined pairwise state differences; one-way ANOVA tested overall group differences.

Findings: Students from Punjab had the most positive overall attitudes (M=48.13, SD=1.64), followed by those from J&K (M=45.66, SD=2.15) and Rajasthan (M=42.79, SD=2.63). At $p<.01$ ($t_s \geq 3.00$), all three pairwise comparisons were significant. ANOVA confirmed a strong overall effect, $F(2,87)=92.70$, $p<.01$; $MS_{\text{between}}=427.85$; $MS_{\text{within}}=4.61$.

Conclusions: Perceptions of PE-related outcomes among students vary markedly by state and seem to be influenced by contextual factors, such as sports culture in Punjab, climatic and infrastructure limitations in Rajasthan, and geopolitical/climatic disruptions in J&K. Results back up the creation of region-responsive PE curricula, targeted infrastructure investment, and teacher training to promote equitable engagement in physical activity across India.

Keywords: Attitudes; Physical fitness; Fundamental motor/game skills; Physical education; Leisure-time physical activity; India; Regional comparison.

INTRODUCTION

A student's overall development depends on their level of physical fitness, basic game skills, physical education (PE), and leisure-time physical activity (LTPA), all of which influence their social, emotional, cognitive, and physical development. Students' opinions about these factors are rarely consistent; instead, they are influenced by factors unique to a given area, such as socioeconomic circumstances, culture, climate, facility accessibility, safety perceptions, and curriculum emphasis. Such influences differ significantly from state to state in a nation as geographically and socio-culturally diverse as India. Designing responsive, equitable PE policy and practice requires an understanding of how local contexts impact school-age populations' perceptions and participation.

This research compares three states viz. Punjab, Rajasthan, and Jammu & Kashmir (J&K), which are distinct from one another in terms of sporting traditions, physical environments, and educational environments. Punjab has a proud sports history and arguably has a stronger school sports culture, which tends to elevate sport as an important identity marker and point of pride. Rajasthan has an arid climate; a large, rural catchment; and an uneven recreation landscape, which makes sustained engagement in outdoor play more complicated particularly during the hottest months of the year. The geopolitical tensions, mountain terrain, and seasonal climate extremes (e.g., snow-bound winters; sporadic school closures) of J&K cause difficulties for a more consistent access to formalized PE and leisure sports. Investigating these states within one comparative framework can deliver transferable insights for regionally-informed programming.

Youth sedentary behaviour is increasing worldwide as screen time, educational expectations, and urban context changes continue to rise. Schools are still one of the few near-universal opportunities children have for daily experiences of movement, health education, and the formation of positive habits. Instead of national strategies, state and locality tailored approaches are necessary to work with India's many varied students.

Being physically fit is essential for a healthy lifestyle and has been associated with a lower risk of non-communicable diseases (NCDs) such as obesity, diabetes, hypertension, and cardiovascular disease conditions seen more frequently in younger populations. (Baumgartner et al., 2020; Garcia-Hermoso et al., 2020; Rainer & Jarvis, 2020). In Punjab, energy dense dietary habits create a greater demand for structured, school based fitness interventions; in Rajasthan, a hot climate and socio-economic context might lead to an adapted model of indoor or time-of-day specific physical activity; while in J&K, physical activity opportunities may be disrupted all year, potentially affecting cumulative fitness gains.

In addition to reducing the chances of diseases occurring, physical fitness is linked to positive cognitive outcomes (especially attention, memory, and classroom behaviour), emotional regulation, and mental health. Adolescence is a pivotal life stage for physical activity through the rapid musculoskeletal development and neurocognitive change. An active lifestyle is more likely to become entrenched if started at an early age. Regular involvement in fitness and sport develops transferable life skills (goal-setter, self-discipline, resilience, time management) (Cheung, 2019; Guo et al., 2023).

Fundamental movement and game skills, including agility, balance, coordination, locomotor control, object control, and spatial awareness, are a prerequisite to any later sport specialization and continued LTPA (Lubans et al., 2010; Gallahue et al., 2012; Bolger et al., 2021). Early mastery of these skills promotes perceived competence, the strongest predictor of continued participation throughout the adolescent years. In Punjab, games like kabaddi and wrestling are part of the cultural knowledge embedded in everyday practices which is supporting early motor development and community engagement for all involved. In much of resource-poor Rajasthan most students rely on informal or unstructured play, some have none or little consistent play intermixed with a variety of ways of play, and skill progression is random and different from child to child. In J&K, perhaps because of long winters, sometimes unpredictable nature of school opening and subsequent fitness programming, fragmentation of their practice time can weaken/suspend the collation of motor skills unless specific adaptive programming (for example, indoor circuits, small space skills stations) is included. Skill-based participation continues to provide an avenue for socio-emotional learning like teamwork skills, communication, leadership, and perseverance which instills positive and healthy attitudes toward lifelong physical activity.

School Physical Education (PE) provides the full curricular framework within which children participate in purposeful learning about movement, health content knowledge, and habits of physical activity. A well-designed PE curriculum has primary objectives mainly to enhance fitness; develop movement competence; educate health literacy; and to develop healthy positive and inclusive attitudes toward lifelong participation. The level of implementation quality varies across states in India as well as within individual states. The diversity in the quality of Physical Education (PE) implementation across regions can be observed through several examples. In Punjab, a strong sports culture supports PE programming; however, disparities persist in terms of educator training, facilities, and equipment, particularly between urban and rural schools, limiting equal access to trained instructors. In Rajasthan, extreme temperatures and inadequate infrastructure hinder outdoor activities, compelling teachers to adapt PE sessions to shaded or indoor areas with limited space. Similarly, in Jammu & Kashmir, frequent weather disruptions, security-related closures, and seasonal accessibility issues necessitate flexible PE planning, where teachers often rely on modular units that can be delivered in smaller segments or indoors.

Challenge for PE is to be inclusive (gender-responsive; ability-aware), fun and process-oriented, focusing on participation, development of skills, and health behaviours rather than only elite performance (Cheung, 2019; Guo et al., 2023). Where recreational infrastructure is uneven, school-based PE may be the primary vehicle through which youth gain structured exposure to movement and health education.

Attitudes toward Physical Education (PE) are shaped by a combination of personal values, perceived competence, social support, school-based socio-cultural norms, and environmental opportunities, all of which vary across regions. In Punjab, sports often serve as a pathway to recognition, community prestige, and even livelihood opportunities, which significantly boosts student motivation. Conversely, in Rajasthan, limited facilities and socio-economic challenges often relegate physical activity to a secondary position behind academics or household responsibilities, reducing its perceived value. In J & K, safety concerns, restricted access, and unpredictable environmental conditions undermine the consistency and confidence associated with organized PE programs, making sustained engagement more difficult.

Importantly, students knowing they have the skill and capability is found to be strongly related to participation and enjoyment (Arslan, 2018; Grith et al., 2020) and supportive climates fostered with the help of teachers, peers and families can shield students from dropping out in relation to their values. Our beliefs about culture, gender, acceptable clothing, and acceptable forms of movement also mediate our attitudes and engagement and can differ according to region.

Leisure-time physical activity like informal sport, dance, play, active transport might be the only source of movement and autonomy. LTPA is an important tool for actioning healthy movement in low-resourced contexts where structured PE may not be available or consistent. The promotion of LTPA can complement learning in schools to support lifelong exercise habits which can reinforce students' learning in the classroom (Carriedo et al., 2023).

REVIEW OF RELATED LITERATURE

Positive attitudes to physical fitness (PF) and physical education (PE) in childhood relate to long-term participation in physical activity, health outcomes, and psychosocial development (Gouveia et al., 2019; Garcia-Hermoso et al., 2020). In schools, these attitudes can predict enjoyment of PE classes, participation in extracurricular sport, and health-promoting behaviours. Participation in sport also has a psychological component namely, positively impacting self-esteem, anxiety, and concentration, and can offer social developmental opportunities such as teamwork and leadership.

Additionally, when interventions are designed with consideration of student interests and cultural norms, youth participation can be increased, especially among less confident or marginalized students. Despite these benefits, the cross-regional comparative evidence in India is not as comprehensive. A considerable amount of existing literature has focused either on one region, one construct (e.g. fitness only), or collective evidence from samples of older students.

Global and National Perspectives

Global context: Sawicki (2023) surveyed 391 secondary school students in Austria and identified an overall positive disposition toward PE, with more interest and potential for physical activity in the future for boys; a majority indicated an intention to remain active after finishing their schooling. This is encouraging, but the study was conducted in Europe a detailed result that will not map directly to India where states such as Rajasthan and J&K have infrastructure and climatic conditions that restrict quality opportunity.

Indian higher-education samples. In Kerala, Thariyan et al. (2023) reported Kerala undergraduates overall had attitudes to physical activity that were principally in the moderate to high range, with a key interaction of gender and student-category but no effect for institutional-type. In their study of Indian students, Shirotriya and Kapri (2023) found positive attitudes to PE, but noted challenges: small number of facilities, variability in program delivery, and imbalance in the interactions between schools and sports associations and agencies across their content regions.

Activity preferences. Moreno (2022) identified, volleyball was the most preferred activity among teacher-education students. Moreno concluded that familiarity and enjoyment might help defined positive attitudes toward physical activity. The lack of observed association between levels of sporting involvement and reported activity impediments, suggests that other barriers to participation, such as social or opportunity gaps, were obscured in our reporting of personal characteristics.

Program dosage and fitness. Cocca et al. (2020) provided evidence that two sessions per week of PE (45 mins in duration) was insufficient time and effort to improve children's cardiorespiratory fitness; thus they argued for more frequent PE lessons or additional opportunities for children's physical activity. This is especially important in climate-restricted regions such as Rajasthan and J&K.

Motivational climate. Aggerholm et al. (2018) have argued mastery-oriented, skill-based PE reduces student anxiety and enhances motivation, which is pertinent in conservative or high-pressure academic contexts typical in parts of northern India.

Studies with Regional Relevance: Punjab, Rajasthan, & J&K

Punjab: Punjab is well known for having a significant grassroots sporting culture, especially in the rural regions where kabaddi and wrestling are part of social life (Baumgartner et al., 2020). Kaur, Bains and Kaur (2018) compared the physical activity and screen time of 1,050 government school children aged 11-17 years, and found no significant urban-rural differences in leisure time physical activity (LTPA) or screen time; however, urban students participated in more school sports, whereas rural students engaged in active commuting at a higher rate. Overall, the participants met recommended levels of physical activity and no participants showed risk profiles for sedentary behaviour.

Rajasthan: In Rajasthan, the arid climate, rural distribution of schools and variable infrastructure are barriers to outdoor PA. Some targeted talent-identification programs, such as the Special Area Games Scheme, have had success in reaching marginalized communities, however participant

recruitment tends to be variable and relies heavily on the local school leaders and community resource mobilization (Koranga, Dhauta & Gogoi, 2024).

Jammu & Kashmir: J&K suffers from layered problems, including geopolitical instability, harsh winters, and disrupted school calendars. However, when these students are given structured opportunities, they are very excited to participate in sport. A collegiate-level study in the Kashmir Valley indicated that many girl students were healthy (positive BMI) and were participating in sport even with very limited facilities, and that infrastructure was needed (Bhat et al., 2017). A comparative study of rural student vs. urban student boys between the ages of 15 and 18 years in the Anantnag district who were administered the AAPHERD Youth Fitness Test demonstrated significant differences in flexibility, agility, speed and endurance suggesting environment-linked differences in fitness (Hajam & Bashir, 2017). A further study comparing PE students from Punjab and J&K demonstrated no significant differences in several psychological and social variables, but the intelligence measures indicated a state-level difference (Ahmad & Singh, 2011).

OBJECTIVE OF THE STUDY

To examine and analyze variations in students' perspectives from Punjab, Rajasthan, and Jammu & Kashmir regarding physical fitness, fundamental game skills, physical education, and leisure-time activities.

HYPOTHESES OF THE STUDY

H₀₁: No significant difference exists in overall attitude between school students from Punjab and J&K.

H₀₂: No significant difference exists in overall attitude between school students from Rajasthan and J&K.

H₀₃: No significant difference exists in overall attitude between school students from Punjab and Rajasthan.

H₀₄: No significant difference exists in overall attitude among school students from Punjab, Rajasthan, and J&K.

METHODOLOGY AND TECHNIQUES

72 final-year B.P.Ed. pupil-teachers at Sant Baba Bhag Singh University completed a 3-month course comprising training on pedagogy, data collection, and facilitation skills related to physical activity. After successfully completing the course, pupil-teachers were organized into nine teams (≈ 8 members each) and placed into intentionally selected government and private schools located in Punjab, Rajasthan, and J&K. The schools selected used criteria for a regionally diverse context (urban/rural/composition), demonstrated a willingness to participate, and were readily able to accommodate participant requirements such as basic facilities.

Participants: Grades 8-10 students were the target population. N=270 participants provided usable data (approx. 90 per state; we used sub-samples of 30 per state in specific pairwise comparisons for balanced statistical testing). Informed consent was obtained from the school authorities, and parents/guardians where applicable.

Instructional intervention: During field visits, pupil-teachers engaged in field-based structured PE sessions, using demonstration, whole-part-whole, imitation, lecture, and skill-drill approaches that were meant to develop an engaging participatory learning context.

Instrument. Data were collected with the Post-Physical Education Program Training Questionnaire: Assessing Physical Fitness, Skills and Attitudes (Singh & Bashir, expert panel

validated). It included 12 closed-ended statements across four domains (1) Physical Fitness, (2) Fundamental Game Skills, (3) Attitude toward PE, and (4) Preferences for Leisure-Time **Activity**. The response format was a 5-point Likert scale (A-E; scored 1-5). Cronbach's alpha was over .80, demonstrating a superior level of internal consistency.

Data analysis: Independent-samples t tests were used for pairwise state comparisons; a one-way ANOVA was also performed for difference across all three states. Standard descriptive statistics (M, SD) were reported. Significance, $p < 0.01$ to reduce Type I error due to multiple comparisons.

TESTING OF HYPOTHESES

H₀₁: No significant difference exists in overall attitude between school students from Punjab and J&K.

Region	N	Mean	SD	DF	't' Value
Punjab	30	48.13	1.64	28	3.07
J&K	30	45.66	2.15		

Table 1 displays the comparative results of school students' overall attitudes toward physical fitness, foundational sports skills, physical education, and leisure-time activities between Punjab and J & K. The mean score for Punjab was **48.13** (SD = 1.64), whereas J & K students had a mean score of **45.66** (SD = 2.15). The **t-test** result yielded a **t-value of 3.07**, which is significant at the **0.01 level**. This indicates a statistically significant difference between the two states. Hence, the **null hypothesis was rejected**.

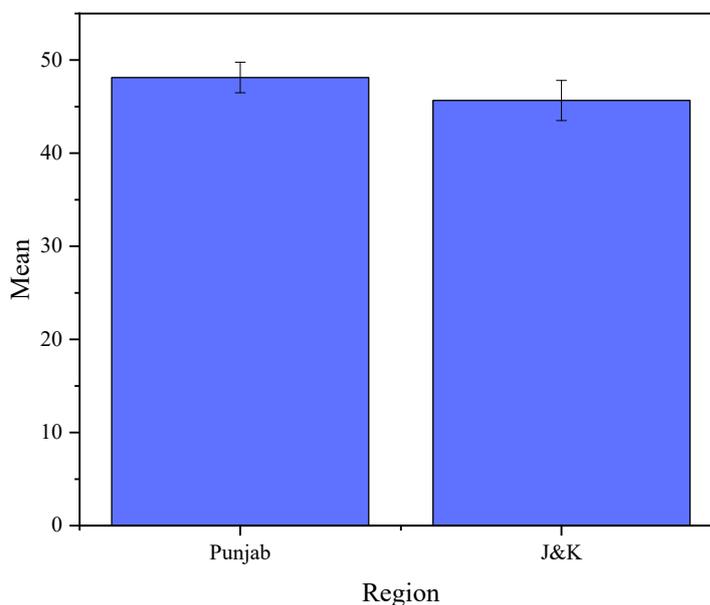


Fig. 1: Comparison of Mean Scores of school students' overall attitudes between Punjab and J & K.

H₀₂: No significant difference exists in overall attitude between school students from Rajasthan and J&K.

Region	N	Mean	SD	DF	'T' Value
Rajasthan	30	42.79	2.63	28	3.00
J&K	30	45.66	2.15		

Table 2 compares Rajasthan and J & K. Rajasthan students scored a mean of **42.79** (SD = 2.63), while the mean for J&K was again **45.66** (SD = 2.15). The computed **t-value of 3.00** is also significant at the **0.01 level**, confirming a substantial difference in students' attitudes between these two states. Therefore, the **null hypothesis was rejected**.

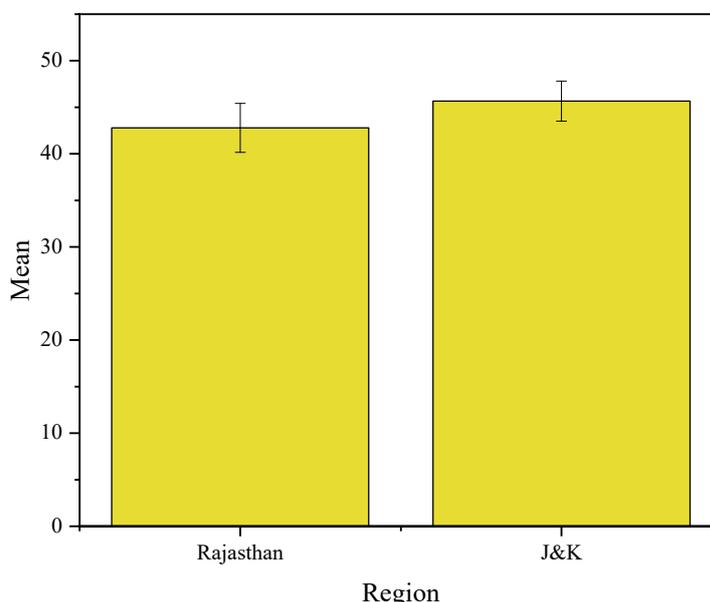


Fig. 2: Comparison of Mean Scores of school students' overall attitudes between Rajasthan and J & K.

H₀₃: No significant difference exists in overall attitude between school students from Punjab and Rajasthan.

Region	N	Mean	SD	DF	'T' Value
Punjab	30	48.13	1.64	28	3.07
Rajasthan	30	42.79	2.63		

Table 3 presents the comparison between Punjab and Rajasthan. Punjab students demonstrated a notably higher mean score (**48.13**, SD = 1.64) compared to Rajasthan (**42.79**, SD = 2.63). The **t-value was again 3.07**, which is significant at the **0.01 level**. The **null hypothesis was thus rejected**, indicating a meaningful difference in attitudes.

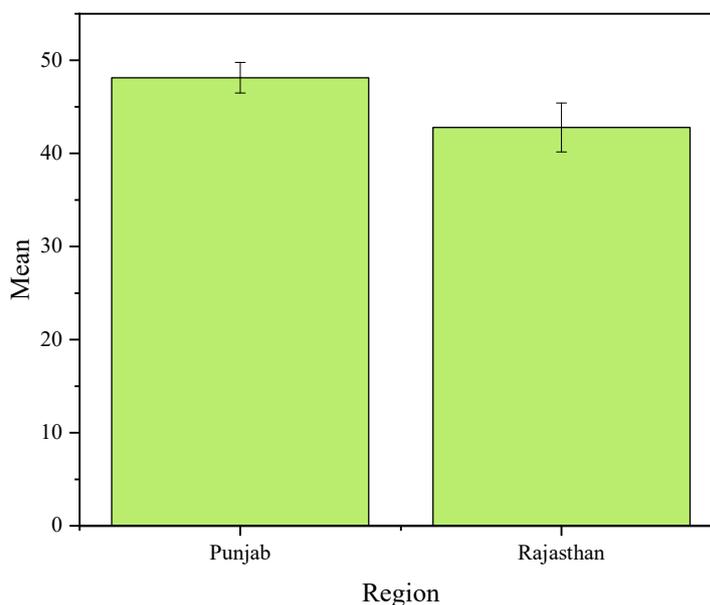


Fig. 3: Comparison of Mean Scores of school students' overall attitudes between Punjab and Rajasthan

H₀₄: No significant difference exists in overall attitude among school students from Punjab, Rajasthan, and J&K.

Table-4: Analysis of Variance (ANOVA) results from Punjab, Rajasthan and J & K school students				
	Sum of Squares	df	Mean Square	F-ratio
Between Groups	855.7	2	427.85	92.7
Within Groups	401.6	87	4.61	
Total	1257.3	89		

Finally, **Table 4** shows the results of a **one-way ANOVA**, comparing all three states. The **F-value of 92.7** was found to be highly significant at the **0.01 level**, revealing that the differences in student attitudes among Punjab, Rajasthan, and J & K are statistically significant. Consequently, the **overall null hypothesis was rejected**.

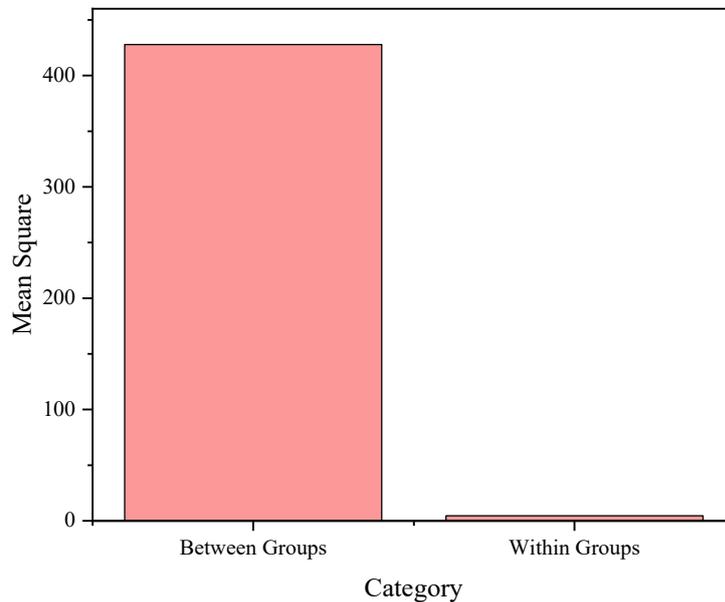


Fig. 4: One-way ANOVA results comparing all three states viz. Punjab, Rajasthan, and J & K

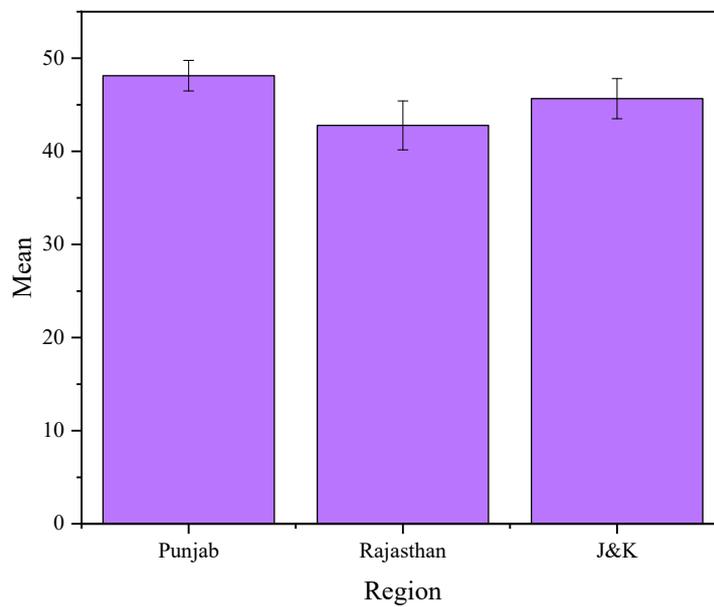


Fig. 5: Comparison of Mean Scores of school students' overall attitudes of Punjab, Rajasthan, and J & K

DISCUSSION

Examining regional variations in students' perceptions of important physical education outcomes was the aim of the study. The omnibus ANOVA and the results of all pairwise comparisons were significant, highlighting the influence of contextual factors on students' engagement and value of physical fitness, basic game skills, PE instruction, and LTPA.

J&K vs. Punjab: Punjab has a higher mean (48.13) than J&K (45.66), which is probably due to the state's well-established sports ecosystem, which includes community games, state-sponsored programs, and a reverence for physical prowess. Despite clear student interest, political unpredictability, infrastructure limitations, and weather disruptions in J&K may prevent consistent program delivery, tempering attitudes.

Rajasthan vs. J&K: Students from J&K indicated more favourable attitudes than students from Rajasthan (45.66 vs. 42.79). Rajasthan's extreme heat, poorer access to athletic facilities in many rural schools, and lower curricular priority for PE may contribute to students' depressed enthusiasm.

Punjab vs. Rajasthan: Punjab indicated higher overall scores than Rajasthan (48.13 vs. 42.79), thus identifying interpretation that supports the idea that a strong cultural sports climate and access to resources positively impacts student attitudes.

Overall ANOVA interpretation: The highly significant F value (92.70) supports the conclusion that regionally based context has a significant impact on student attitudes. The relatively low MS_{within} (4.61) indicates that the variability of attitude within each school within a state was low, compared to the variability of attitude across states in this sample, further support the prominence of macro-context influences (culture, climate, infrastructure).

INTERPRETATION AND IMPLICATIONS

The persistent rejection of all four null hypotheses suggests that context matters when it comes to students attitudes towards physical education and physical activity. The differences underscore the impact of cultural histories, instructional policies, available infrastructure, environmental conditions, and social values relating to physical fitness, therefore across Indian states.

- The overall performance of Punjab in all four pairwise comparisons suggests that this state excels in sports due to a well-defined sports culture, and the province is highly developed and possesses accessible infrastructure, and possibly commitment to sports community-level participation. In this regard, physical education is entrenched within formal and informal educational experiences and the state highlights a model to compare against.
- J&K intermediate levels are perplexing due to both geographical and climate issues, yet there seems to be an underlying interest in physical education and related activities (sports) that potentially could shift positively with more structured school programs, increased professional development for teachers, and more relevant seasonal PE modules.
- Rajasthan demonstrated an overall lack of multiple opportunities to engage in physical recreation, therefore sports initiatives require immediate and aggressive policy responses, with emphasis on improving sports parks infrastructure to provide physical activity opportunities for young people, the hiring, training and implementing certified physical education teachers, and also in developing a more educational physical education curriculum so that physical education has similar priorities as subject area learning experiences.

CONCLUSION

This comparative investigation indicates that students' attitudes towards physical fitness, fundamental game skills, PE, and leisure-time activity differ statistically significantly across Punjab, Rajasthan, and J&K in this study. Coherently, Punjab students claimed strongest attitudes, likely resulting from the state's rich sports culture as well as, on average, greater opportunities for activity. J&K students exhibited moderately positive attitudes, which may reflect a latent engagement there; despite some infrastructural and geopolitical challenges, adequate programming exists for attitudinal changes in student behaviours during leisure. Rajasthan students exhibited the weakest attitudes, likely as a result of the worst environmental and socioeconomic challenges, although resources for further sports and recreation engagement may be unavailable.

Each of the class relationships wherein the null hypotheses contained all four states were rejected. All pairwise state comparisons were statistically significant ($p < .01$) and the omnibus ANOVA indicated significant variance, so it is apparent that there is substantial group variance ($F = 92.70$, $p < .01$). Although previous research indicated some relationship with geography and student attitudes towards physical fitness (McKenzie, 2010; Schellenberg et al., 2012), overall variation among student attitudes within the same geographical proximity reinforces the need for a fit-for-context physical education policy in India. There is also a need for PE practitioners in India to adapt their physical education curricula and further develop appropriate physical activity facilities, while also nurturing and building teachers' capacity (resources) and partnerships with the community, and connecting physical education to culture, especially to promote opportunities for equitable and sustainable participation in physical activity for school-age youth.

REFERENCES

- Aggerholm, K., Standal, Ø. F., & Hordvik, M. M. (2018). Competition in physical education: Avoid, ask, adapt or accept? *Quest*, 70(3), 385–400. <https://doi.org/10.1080/00336297.2017.1415151>
- Ahmad, H., & Singh, S. (2011). Selected psychological and social variables of professional students of Punjab and Jammu & Kashmir states. *Indian Journal of Science and Technology*, 4(12), 1–5. [https://doi.org/\[insert if available\]](https://doi.org/[insert if available])
- Arslan, G. (2018). Social exclusion, social support and psychological wellbeing at school: A study of mediation and moderation effect. *Child Indicators Research*, 11, 897–918. <https://doi.org/10.1007/s12187-017-9451-1>
- Baumgartner, L., Weberruss, H., Oberhoffer, R., & Schulz, T. (2020). Vascular structure and function in children and adolescents: What impact do physical activity, health-related physical fitness, and exercise have? *Frontiers in Pediatrics*, 8, 103. <https://doi.org/10.3389/fped.2020.00103>
- Baumgartner, T. A., Hensley, L. D., et al. (2020). *Measurement for evaluation in physical education and exercise science* (9th ed.). McGraw-Hill Education.
- Bhat, B. A., Khan, S., Anees, S. U. M., Sidiq, T., Ahmad, I., & Rafiq, R. (2017). A study on opinion of girl students of Kashmir Valley towards participation in sports. *International Journal of Innovation*, 7(1), 1–5.
- Bolger, L. E., Bolger, L. A., O'Neill, C., Coughlan, E., O'Brien, W., Lacey, S., Burns, C., & Bardid, F. (2021). Global levels of fundamental motor skills in children: A systematic review. *Journal of Sports Sciences*, 39(7), 717–753. <https://doi.org/10.1080/02640414.2020.1841405>

- Carriedo, A., Cecchini, J. A., Méndez-Giménez, A., Sanabrias-Moreno, D., & González, C. (2023). Impact of teachers' autonomy support in students' basic psychological needs, intrinsic motivation and moderate-to-vigorous physical activity. *Children*, 10(3), Article 4089. <https://doi.org/10.3390/children10030489>
- Cheung, P. (2019). Teachers as role models for physical activity: Are preschool children more active when their teachers are active? *European Physical Education Review*, 26(1), 101–110. <https://doi.org/10.1177/1356336X19835240>
- Cocca, A., Verdugo, F. E., Cuenca, L. T. R., & Cocca, M. (2020). Effect of a game-based physical education program on physical fitness and mental health in elementary school children. *International Journal of Environmental Research and Public Health*, 17(13), 1–13. <https://doi.org/10.3390/ijerph17134883>
- Gallahue, D. L., Ozmun, J. C., & Goodway, J. D. (2012). *Understanding motor development: Infants, children, adolescents, adults* (7th ed.). McGraw-Hill.
- García-Hermoso, A., Alonso-Martínez, A. M., Ramírez-Velez, R., & Izquierdo, M. (2020). Effects of exercise on health-related physical fitness and blood pressure in preschool children: A systematic review and meta-analysis of randomized controlled trials. *Sports Medicine*, 50, 187–203. <https://doi.org/10.1007/s40279-019-01191-w>
- Gouveia, E., Ihle, A., Gouveia, B., Rodrigues, A., Marques, A., Freitas, D., Kliegel, M., Correia, A., Alves, R., & Lopes, H. (2019). Students' attitude toward physical education: Relations with physical activity, physical fitness, and self-concept. *The Physical Educator*, 76, 945–963. <https://doi.org/10.18666/TPE-2019-V76-I4-8923>
- Grith, J. M., Long, E. E., Young, J. F., & Hankin, B. L. (2020). Co-occurring trajectories of depression and social anxiety in childhood and adolescence: Interactive effects of positive emotionality and domains of chronic interpersonal stress. *Journal of Abnormal Child Psychology*, 48(6), 823–837. <https://doi.org/10.1007/s10802-020-00634-7>
- Guo, Q., Samsudin, S., Yang, X., Gao, J., Ramlan, M. A., Abdullah, B., & Farizan, N. H. (2023). Relationship between perceived teacher support and student engagement in physical education: A systematic review. *Sustainability*, 15(7), 6039. <https://doi.org/10.3390/su15076039>
- Hajam, B. A., & Bashir, S. (2017). A comparative study of physical fitness among rural and urban male students of district Anantnag in Jammu and Kashmir. *Asia Pacific Journal of Research*, 50(1), 1–10. [Print ISSN 2320-5504].
- Kaur, S., Bains, K., & Kaur, H. (2018). Comparative study on sedentary behaviour and physical activity pattern of urban and rural government school children of Punjab (India). *Applied Biological Research*, 20(3), 271–277.
- Koranga, H., Dhauta, R., & Gogoi, H. (2024). Factors influencing youth sports participation in India: A narrative review. *Fizjoterapia Polska*, 4(1), 244–251.
- Lazarević, D. (2015). Attitudes of early adolescent students towards physical education. *Physical Culture*, 69(2), 88–98. <https://doi.org/10.5937/fizkul1502088L>
- Lubans, D. R., Morgan, P. J., Cliff, D. P., Barnett, L. M., & Okely, A. D. (2010). Fundamental movement skills in children and adolescents: Review of associated health benefits. *Sports Medicine*, 40(12), 1019–1035. <https://doi.org/10.2165/11536850-000000000-00000>
- Moreno, S. O. (2022). Attitudes and involvement of students toward sports activities. *International Journal of Physical Education, Sports and Health*, 9(1), 339–344.
- Rainer, P., & Jarvis, S. (2020). Fundamental movement skills and their relationship with measures of health-related physical fitness of primary school children prior to secondary school

- transition: A Welsh perspective. *Education 3-13*, 48(1), 54–65. <https://doi.org/10.1080/03004279.2019.1573264>
- Sawicki, Z. (2023). Attitudes of Austrian high-school students towards selected aspects of school physical education in light of gender and environmental conditions. *Journal of Physical Education and Sport*, 23(7), 1660–1669. <https://doi.org/10.7752/jpes.2023.07203>
- Shirotriya, A. K., & Kapri, B. C. (2023). School students' attitudes towards physical education: Findings from India. *Sports Science & Health Advances*, 1(2), 86–95. <https://doi.org/10.60081/ssha.1.2.2023.86-95>
- Tabussum, S., Asif, M., & Ahmed, N. (2017). Scientific benefits and attitude towards physical activity and physical education. *International Journal of Scientific & Engineering Research*, 8(7), 643–647.
- Thariyan, P., Varghese, G. B., & Ajesh, C. R. (2023). Attitude towards physical activity among undergraduate students in Kerala. *Journal of Survey in Fisheries Sciences*, 10(4S). <https://doi.org/10.17762/sfs.v10i4S.855>
- Zeng, Z., & Wang, X. (2015). Exploring principals' physical education perceptions and views in Shanghai, China. *World Journal of Education*, 5(6), 1–10. <https://doi.org/10.5430/wje.v5n6p37>