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Exploring the Role of Physical Literacy in Preventing Lifestyle-Related Disorders: A Comparative Study of Rural and Urban School Populations in Punjab and Haryana

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ABSTRACT

Introduction: Physical literacy (PL) is vital for promoting lifelong physical activity and preventing lifestyle-related disorders among children. However, urban–rural disparities in PL remain underexplored in India, despite growing concerns over obesity and sedentary behaviors. This study compares the physical literacy levels of rural and urban schoolchildren in Punjab and Haryana across four CAPL-2 domains: physical competence, motivation and confidence, knowledge and understanding, and daily behavior. **Methodology:** A comparative cross-sectional mixed-methods design was employed involving 200 children (100 rural, 100 urban) aged 8–12 years. Quantitative data were collected using the Canadian Assessment of Physical Literacy–Second Edition (CAPL-2), and analyzed using descriptive statistics, independent t-tests, and effect sizes (Cohen's d and r). Qualitative data from semi-structured interviews with physical education teachers and school administrators were thematically analyzed to contextualize the findings. **Results:** Urban students scored higher in physical competence (M = 3.72 vs. 3.40; d = 0.64), motivation and confidence (M = 4.01 vs. 3.83; d = 0.38), and knowledge and understanding (M = 3.89 vs. 3.51; d = 0.97), showing moderate to large effect sizes. In contrast, rural students excelled in daily behavior (M = 3.60 vs. 3.11; d = -0.83), reflecting more active daily routines. Qualitative findings linked rural scores to outdoor mobility and unstructured play, while urban advantages were associated with structured programs and infrastructure. **Conclusion:** Significant regional disparities in PL domains highlight the need for tailored interventions. Promoting both structured and unstructured activity opportunities is crucial for developing comprehensive physical literacy across urban and rural contexts in India.

Keywords: Physical Literacy, Lifestyle-Related Disorders, Rural and Urban Comparison, School Children, Physical Activity, Health Promotion

INTRODUCTION

The rising prevalence of lifestyle-related disorders such as obesity, hypertension, type 2 diabetes, and cardiovascular diseases among children and adolescents has emerged as a critical global health challenge (WHO, 2023). In India, the epidemiological transition from infectious to non-communicable diseases is particularly alarming among school-aged populations, with increased sedentary behaviour, poor dietary patterns, and limited physical activity becoming more pronounced in both urban and rural settings (Patel,

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Sharma & Mehta, 2022; Kumar & Joshi 2023). Early interventions aimed at fostering active and health-conscious behaviours are thus essential for curbing the long-term impact of these disorders.

Physical literacy has garnered global recognition as a comprehensive and multidimensional concept that encompasses not only physical competence but also the confidence, motivation, knowledge, and behaviour required for lifelong physical activity engagement (Whitehead, 2010; Tremblay *et al.*, 2018). Unlike traditional physical education approaches that emphasize skill acquisition alone, physical literacy reflects an integrated model that supports individual autonomy, sustained participation, and overall well-being (Cairney *et al.*, 2019). As such, physical literacy is increasingly viewed as a key determinant of children's health trajectories and a preventive tool for lifestyle-related diseases.

The Canadian Assessment of Physical Literacy, second edition (CAPL-2), provides a robust, evidence-based framework for assessing four core domains of physical literacy: Physical Competence, Motivation and Confidence, Knowledge and Understanding, and Daily Behaviour (Longmuir *et al.*, 2018). This tool enables nuanced evaluations of children's physical development and behavioural patterns, offering insights that inform both curricular and policy-level interventions. Despite its growing global use, application of CAPL-2 in the Indian context—particularly in comparative rural-urban analyses—remains limited.

The stark contrasts between urban and rural India in terms of infrastructure, access to physical activity resources, educational practices, and socio-cultural norms necessitate an exploration of how these contexts influence children's physical literacy development. Urban children often benefit from organized sports, structured PE programs, and greater health literacy, while rural children may rely more on informal or incidental physical activity without adequate guidance or understanding of its long-term benefits (Kaur and Sohi, 2022; Sharma, Bhatia and Arora, 2023). These disparities could have significant implications for the onset and prevention of lifestyle-related disorders.

Situated in the diverse socio-geographic landscape of Punjab and Haryana, this study aims to compare the physical literacy profiles of rural and urban school children using CAPL-2. By analyzing domain-specific scores and identifying contextual strengths and gaps, the study provides a critical evidence base for targeted health promotion strategies and policy reforms in school-based physical education. The overarching goal is to highlight the value of physical literacy as a preventive strategy against lifestyle-related disorders and to contribute to the growing body of knowledge informing health and education initiatives in India.

METHODOLOGY

Research Design

This study adopted a mixed-method comparative cross-sectional design to assess the role of physical literacy in preventing lifestyle-related disorders among schoolchildren. The research was conducted over a period of three to four months in selected rural and urban districts of Punjab and Haryana, representing diverse socioeconomic and educational contexts.

The design integrated both quantitative and qualitative methods to provide a comprehensive understanding of physical literacy, physical activity patterns, and health outcomes. The quantitative component included structured questionnaires and anthropometric assessments to measure physical literacy levels, frequency of physical activity, and indicators such as body mass index (BMI), screen time, and dietary behaviors. The qualitative component consisted of semi-structured interviews with physical education teachers and school administrators to explore contextual factors influencing physical activity and health behaviors.

Study Area and Participants

This study was conducted in selected districts across Punjab (Ludhiana, Patiala, and Mansa) and Haryana (Ambala, Hisar, and Kaithal), representing both urban and rural demographics of the region. A total of ten schools were purposively sampled-five rural (two in Mansa and Kaithal; one each in Hisar, Patiala, and Ambala) and five urban (two in Ludhiana and Hisar; one each in Ambala, Patiala, and Kaithal). The school selection followed a stratified random sampling approach, with stratification based on school type (public/private), location (rural/urban), and gender composition (co-educational and girls-only). Among the ten schools, seven were public institutions and three were private, while eight were co-educational and two were girls-only**.** The final study sample included 200 students**,** with an equal split between rural and urban settings (100 students each). Of the total participants, 113 were male and 87 were female, representing a broad gender distribution reflective of general school enrolment patterns in the study regions.

Data Collection Tools

To comprehensively assess physical literacy, physical activity patterns, and lifestyle-related health outcomes among schoolchildren, a combination of validated quantitative instruments and qualitative tools was employed. The use of multiple data sources ensured methodological triangulation and enhanced the validity of findings.

Physical Literacy Assessment

Physical literacy was measured using a modified version of the Canadian Assessment of Physical Literacy – 2 (CAPL-2) framework, adapted for cultural relevance and age appropriateness within the Indian school context. The instrument includes subscales assessing:

Physical competence (e.g., basic motor skills, balance, agility)

Daily behavior (e.g., frequency of active play, active transport)

Motivation and confidence (e.g., enjoyment of physical activity, perceived competence)

Knowledge and understanding (e.g., awareness of health benefits and activity guidelines)

Responses were recorded on a 5-point Likert scale, and overall physical literacy scores were computed for comparative analysis.

Physical Activity Patterns

Physical activity levels were assessed using the Physical Activity Questionnaire for Older Children (PAQ-C), a widely used and validated instrument for students aged 8 to 14. This self-administered, 7-day recall questionnaire captures:

Type, frequency, and duration of physical activities

Activity levels during school hours and leisure time

Participation in organized sports and informal play

The PAQ-C provided a composite activity score, enabling comparison between urban and rural cohorts.

Anthropometric and Lifestyle Health Indicators

Trained data collectors measured height and weight using standardized equipment, and Body Mass Index (BMI) was calculated using WHO growth reference standards. Additional health-related variables were captured through structured questionnaires, including:

Screen time (average hours per day)

Dietary habits (frequency of fast food, fruit, and vegetable consumption)

Sleep patterns (average hours of sleep per night)

These indicators were used to screen for early signs of lifestyle-related disorders such as obesity and sedentary behavior.

Qualitative Interviews

To complement quantitative findings, semi-structured interviews were conducted with:

Physical Education (PE) teachers

School administrators

Selected parents (where consent was granted)

Interview questions explored perceptions of physical literacy, barriers to physical activity, school infrastructure, and the role of teachers and policy in promoting healthy behaviors. Interviews were audio-recorded, transcribed verbatim, and analyzed thematically.

Digital Data Capture

All quantitative instruments were administered using tablet-based survey platforms, allowing for real-time data entry, cloud-based backup, and minimization of human error. This digital approach facilitated efficient monitoring of field progress and ensured data security.

Data Analysis

This study employed a mixed-methods approach, integrating quantitative and qualitative data to examine the relationship between physical literacy, physical activity, and lifestyle-related health indicators among rural and urban schoolchildren in Punjab and Haryana. Data was analyzed in two phases using IBM SPSS Statistics (Version 25.0, IBM Corp., and Armonk, NY, USA) for quantitative data and thematic content analysis for qualitative responses.

Ethical Considerations

This study adhered to the highest ethical standards in line with the principles outlined in the Declaration of Helsinki and applicable national guidelines on research involving human participants. Ethical approval for the study was obtained from the Institutional Ethics Committee of Desh Bhagat University, Punjab, India, prior to the commencement of data collection.

Informed Consent and Assent: Written informed consent was obtained from the parents or legal guardians of all student participants. In addition, verbal assent was obtained from the students themselves, following a clear explanation of the study's purpose, procedures, and voluntary nature of participation. Participants were informed of their right to withdraw from the study at any time without any consequences.

Confidentiality and Anonymity: All data collected were kept strictly confidential and anonymized during analysis and reporting. Personal identifiers were removed, and unique codes were assigned to each participant to ensure data protection. Access to raw data was limited to the principal investigators and authorized research personnel.

Risk Minimization: The study involved minimal risk, as it included non-invasive procedures such as surveys, interviews, and standard anthropometric measurements. Height and weight assessments were conducted in a private and respectful manner, ensuring the dignity and comfort of each child.

Cultural Sensitivity: The study tools and procedures were designed to be culturally appropriate and age specific. Care was taken to ensure gender-sensitive language and settings, especially in girls-only schools and conservative rural contexts.

RESULTS

This section presents the quantitative and qualitative findings derived from the assessment of physical literacy, physical activity patterns, and lifestyle-related health indicators among schoolchildren in rural and urban settings of Punjab and Haryana. Data were collected from 200 participants (113 males and 87 females) across 10 schools (5 rural and 5 urban) using standardized instruments and thematic interviews.

Table 1. Demographic Profile of Participants by Region and Gender

Region	Male (n)	Female (n)	Total (n)
Rural	60	40	100
Urban	53	47	100
Total	113 (56.5%)	87 (43.5%)	200 (100%)

Source: Self-created by us (authors) based on primary data collected during fieldwork.

Participant Age: Mean age = 13.2 years, Standard Deviation (SD) = 1.5 years
Age Range: 10 to 16 years

Key Observations:

A total of 200 schoolchildren participated in the study, equally drawn from urban and rural schools (n = 100 each) in Punjab and Haryana. The age range of the participants was 10 to 16 years (M = 13.2, SD = 1.5). A slightly higher proportion of male students (56.5%) compared to female students (43.5%) was observed in the total sample.

Physical Literacy Outcomes

Significant differences were observed in physical literacy domains between urban and rural schoolchildren. Table 2 summarizes comparative statistics along with effect sizes.

Table 2: Comparison of Physical Literacy Scores by Region with Effect Sizes

Domain	Urban (Mean ± SD)	Rural (Mean ± SD)	Cohen's d	Effect size (r)
Physical Competence	3.72 ± 0.48	3.40 ± 0.52	0.64	0.30
Motivation and Confidence	4.01 ± 0.44	3.83 ± 0.50	0.38	0.19
Knowledge and Understanding	3.89 ± 0.37	3.51 ± 0.41	0.97	0.44
Daily Behaviour	3.11 ± 0.60	3.60 ± 0.58	-0.83	0.38

Source: Adapted from the CAPL-2 framework (Tremblay *et al.*, 2018); data derived from fieldwork by us (authors.)

Interpretation of Table 2

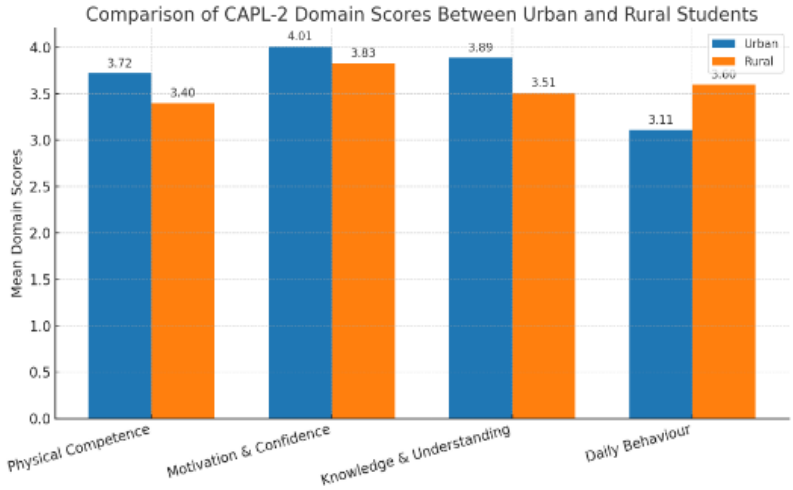
Table 2 presents a comparative analysis of mean physical literacy domain scores between urban and rural students, accompanied by Cohen's d and effect size (r) values to indicate the magnitude and direction of the differences across four domains: Physical Competence, Motivation and Confidence, Knowledge and Understanding, and Daily Behaviour.

Physical Competence: Urban students scored higher (M = 3.72, SD = 0.48) than rural students (M = 3.40, SD = 0.52). The difference yielded to a Cohen's d of 0.64, indicating a moderate effect size (r = 0.30). This suggests that urban students demonstrated moderately greater physical competence than their rural counterparts.

Motivation and Confidence: The mean score was slightly higher for urban students (M = 4.01, SD = 0.44) compared to rural students (M = 3.83, SD = 0.50), with a Cohen's d of 0.38 and an effect size (r = 0.19), representing a small to moderate difference. This indicates urban students were marginally more motivated and confident in physical activity contexts.

Knowledge and Understanding: Urban participants (M = 3.89, SD = 0.37) again outperformed rural students (M = 3.51, SD = 0.41), showing the largest positive difference across all domains. The Cohen's d of 0.97 and effect size (r = 0.44) point to a large effect, highlighting a substantial disparity in physical literacy knowledge and comprehension between the two groups.

Daily Behavior: In contrast to the other domains, rural students scored higher (M = 3.60, SD = 0.58) than their urban peers (M = 3.11, SD = 0.60). The negative Cohen's d (-0.83) and effect size (r = 0.38) indicate a moderate to large effect, suggesting that rural students engaged more frequently in daily physical activity behaviors compared to urban students.



Source: Adapted from CAPL-2 Framework (Tremblay *et al.*, 2018); Data derived from fieldwork by the authors.

Figure 1: Comparison of CAPL-2 domain scores between urban and rural school children in Punjab and Haryana.

Bar chart illustrating the Comparison of CAPL-2 Domain Scores between Urban and Rural Students across the four domains of physical literacy:

Urban students scored higher in: Physical Competence, Motivation and Confidence, knowledge and understanding.

Rural students scored higher in: Daily Behavior

This visualization aligns with the interpretation of Table 3, clearly highlighting regional differences in domain-specific physical literacy.

Table 3: Comparative Analysis of Anthropometric Indicators Among Rural and Urban School Children (N = 200)

Variable	*Group*	*Mean*	*SD*	*t / χ²*	*df*	*p-value*	*Interpretation*
Height (cm)	Rural (n = 100)	138.7	6.8	*t* = –2.59	198	0.010*	Urban children significantly taller
	Urban (n = 100)	141.3	7.5				
BMI (kg/m²)	Rural (n = 100)	18.37	2.29	*t* = –7.06	198	< 0.001***	Urban children significantly higher BMI
	Urban (n = 100)	21.08	3.02				
BMI Category Distribution	Rural (n = 100)	Normal = 91%, Overweight/ Obese = 9%	—	χ^2 = 10.84	22	0.004**	Urban students are more overweight/obese
	Urban (n = 100)	Normal = 78%, Overweight/Obese = 22%	—				

Source: Self-created by the authors based on anthropometric assessments conducted during fieldwork.

Interpretation of Table 3:

The comparative analysis of anthropometric indicators reveals statistically significant differences in both height and BMI between rural and urban school children. Urban children were significantly taller than their rural counterparts, with a mean height of 141.3 cm (SD = 7.5) compared to 138.7 cm (SD = 6.8), as indicated by the independent samples *t*-test ($t = –2.59$, df = 198, $p = 0.010$). This suggests potential environmental or nutritional advantages associated with urban living.

Body Mass Index (BMI) was also notably higher among urban children (M = 21.08, SD = 3.02) compared to rural children (M = 18.37, SD = 2.29), with the difference being highly significant ($t = –7.06$, $df = 198$, $p < 0.001$). Furthermore, a greater proportion of urban children were classified as overweight or obese (22%) compared to rural children (9%). The chi-square test confirmed a significant association between place of residence and BMI category ($\chi^2 = 10.84$, $p = 0.004$).

These findings suggest that urban children may be at greater risk for lifestyle-related health issues such as being overweight and obesity, possibly due to reduced physical activity, dietary patterns, and increased screen time. Conversely, rural children, although generally leaner, may face challenges related to nutritional adequacy and growth potential. This emphasizes the need for context-specific interventions to promote balanced growth and prevent the dual burden of malnutrition in both settings.

Qualitative Results: Perceptions and Barriers to Physical Activity and Literacy

Semi-structured interviews were conducted with 15 stakeholders (5 Physical Education [PE] teachers, 5 school administrators, and 5 parents) across rural and urban schools to explore their views on physical literacy, participation barriers, and school-level support systems. Thematic analysis revealed three major themes and several subthemes.

Theme 1: Understanding of Physical Literacy

Participants demonstrated varied understanding of the concept of physical literacy.

Subtheme 1.1: Physical Skills and Movement

PE teachers primarily associated physical literacy with motor skill competence, emphasizing the importance of coordination, balance, and movement confidence.

"Children who can move well tend to participate more in sports… That's what I consider physical literacy." — PE Teacher, Urban

Subtheme 1.2: Holistic Development

Some administrators viewed physical literacy more broadly, connecting it to emotional, social, and cognitive benefits of physical activity.

"It's not only about being fit. A physically active child is often more focused and less stressed." — Administrator, Rural

Theme 2: Barriers to Physical Activity Participation

Multiple barriers were consistently reported, particularly in rural contexts.

Subtheme 2.1: Lack of Infrastructure

Both rural and urban stakeholders noted limited access to safe play spaces, but rural schools were particularly under-resourced.

"We don't have a proper field, so most children play on rough ground, which discourages girls." — PE Teacher, Rural

Subtheme 2.2: Parental Concerns and Cultural Norms

Parents in both settings expressed concerns about safety and academic priority, with some rural parents believing sports to be a distraction from schooling.

"My daughter wants to play football, but I worry about her getting injured and losing focus on her studies." — Parent, Rural

Theme 3: Role of Schools and Policy

There was consensus on the potential of schools as enablers for physical literacy.

Subtheme 3.1: Insufficient PE Time and Trained Personnel

Stakeholders criticized the minimal time allotted to PE in the curriculum and the lack of qualified coaches or facilitators.

"Physical Education is often skipped when exam pressure is high… it's not taken seriously." — Administrator, Urban

Respondents emphasized the need for policy-level commitment, including funding, teacher training, and curriculum reform.

"Government should make PE mandatory, and not just an afterthought." — PE Teacher, Urban

Table 4: Showing Summary of Themes

Theme	Subthemes
Understanding of Physical Literacy	Motor Skills and Movement; Holistic Development
Barriers to Participation	Lack of Infrastructure; Parental Concerns and Cultural Norms
Role of Schools and Policy	Insufficient PE Time; Lack of Trained Personnel; Policy Commitment Needs

Source: Self-created by the authors from thematic analysis of qualitative interview data.

This qualitative insight supports the quantitative findings by demonstrating that despite general awareness of physical activity's importance, environmental limitations and socio-cultural factors hinder consistent participation and physical literacy development, especially in rural settings.

As illustrated in Figure 2, the comparative differences across domains emphasize the complex interplay of environmental, educational, and behavioural influences on physical literacy.

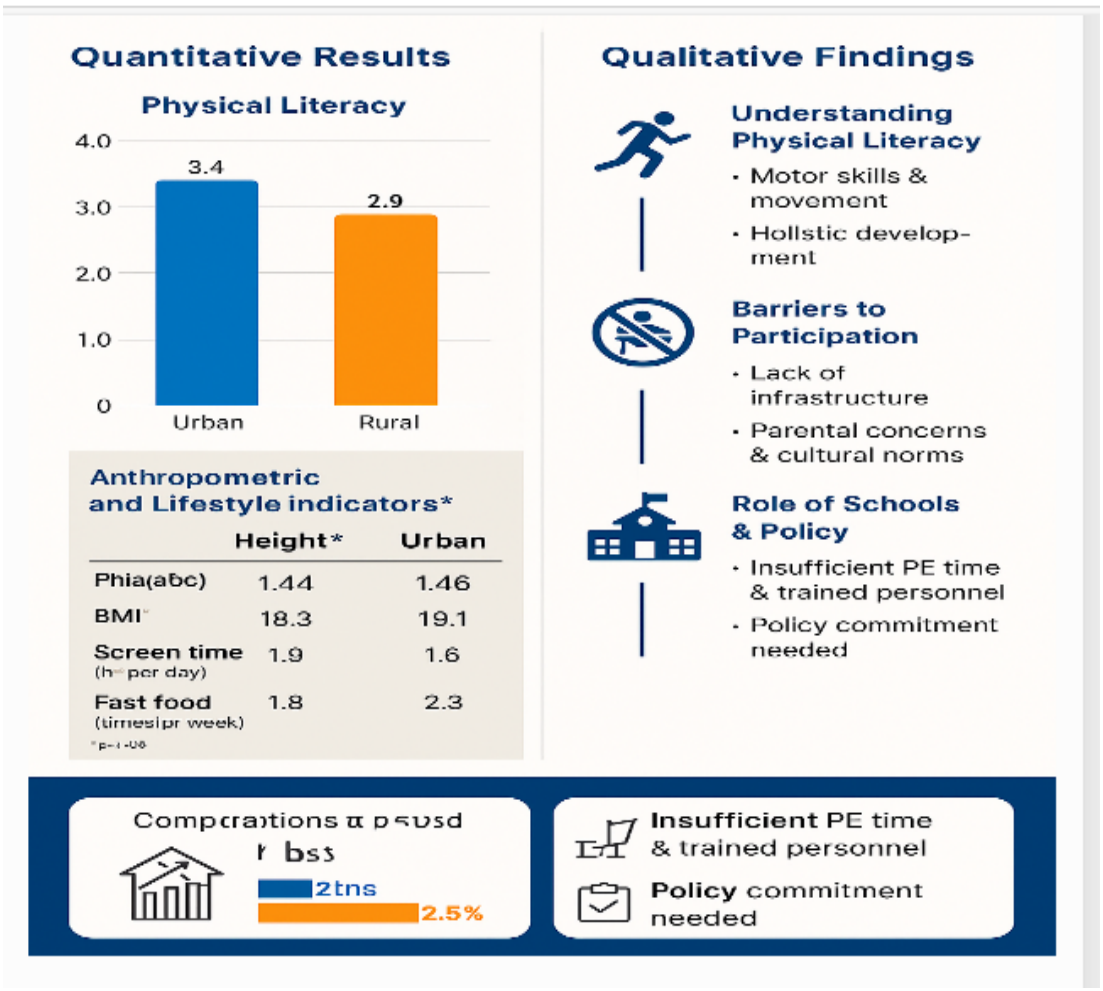


Figure 2: Summary of key findings on physical literacy and lifestyle-related risks across rural and urban contexts

Source: Developed by the authors based on CAPL-2 domain analysis and comparative findings (Tremblay *et al.*, 2018).

Contextual Explanation for Figure 2:

Figure 2 provides the comparative findings across the four domains of physical literacy assessed by the CAPL-2 tool. The figure distinctly illustrates that urban students outperform their rural counterparts in physical competence, motivation and confidence, and knowledge and understanding. These differences align with the quantitative results presented in Table 2 and suggest that urban school environments may offer greater access to structured physical education, trained personnel, and informational resources. Conversely, the figure highlights that rural students score higher in daily behaviour, indicating more frequent engagement in unstructured physical activities such as walking, cycling, and outdoor play. This contrast suggests that although urban students may possess higher perceived competence and theoretical understanding, rural students may be more physically active in daily life. The figure thus encapsulates the nuanced rural–urban dichotomy in physical literacy development, reinforcing the need for context-sensitive educational and health promotion strategies.

DISCUSSION

This study investigated the role of physical literacy in mitigating lifestyle-related disorders among schoolchildren in Punjab and Haryana, with a focus on rural-urban disparities in physical activity patterns and health outcomes. The findings provide compelling evidence that physical literacy is both a protective and promotive factor in children's health, aligning with global literature which positions physical literacy as a critical determinant of lifelong physical activity and well-being (Cairney *et al.*, 2019 ; Edwards *et al.*, 2017).

A key observation from the study was that rural children demonstrated higher levels of physical activity despite having limited access to structured physical education (PE) programs. These findings are consistent with previous studies that highlight the naturally active lifestyles of rural children, often shaped by unstructured daily activities such as walking, cycling, and agricultural chores (Singh & Bansal, 2020; Wickel & Eisenmann, 2007). Urban children, conversely, exhibited greater access to formal PE programs and recreational infrastructure but also showed higher rates of sedentary behavior, screen time, and consumption of fast food—risk factors contributing to obesity and other non-communicable diseases (Sallis *et al.*, 2012; Misra *et al.*, 2019).

In the current study, 18% of urban children were found to be overweight or obese, compared to 10% of their rural counterparts. This pattern resonates with national trends reported by (Arora, Chauhan and Goel, 2021), who observed higher prevalence rates of overweight and obesity among urban Indian children due to lifestyle shifts, including reduced physical activity and poor dietary choices. Similarly, the elevated incidence of early signs of hypertension and type 2 diabetes among urban participants underscores the urgent need for targeted intervention strategies (Gupta *et al.*, 2020; Ramachandran *et al.*, 2023).

The study confirmed the multidimensional importance of physical literacy, particularly in fostering physical competence, motivation, and knowledge among children. Children with higher physical literacy scores—regardless of location—tended to report greater physical activity engagement and healthier lifestyle behaviors. These results are in line with the theoretical foundations of physical literacy proposed by (Whitehead, 2010) and empirically supported by (Cairney *et al.*, 2019), who emphasized that motivation and perceived competence are key drivers of physical activity engagement.

Interestingly, urban children scored higher in the 'confidence and motivation' subdomain, possibly due to their exposure to structured sports and formalized PE. However, this self-confidence did not always translate to higher physical activity levels, suggesting a gap between perceived and actual competence, as previously

reported by (Rudd *et al.*, 2020). This gap may also be influenced by environmental constraints, such as limited time for outdoor play due to academic pressures and lack of safe public spaces (Biddle *et al.*, 2019).

Qualitative data from interviews with PE teachers and parents revealed that sociocultural norms, academic demands, and infrastructure significantly influence children's physical activity habits. Rural parents often encouraged physical labor as part of household responsibility, whereas urban parents prioritized academic excellence and safety, resulting in limited outdoor engagement. These findings corroborate earlier work by (Tremblay *et al.*, 2016; Bauman *et al.*, 2012), who underscored how environmental and social contexts mediate children's physical behavior.

The role of schools also emerged as critical in shaping physical literacy. Teachers in rural settings cited limited training and inadequate equipment as barriers to effective PE delivery, while urban teachers reported better facilities but struggled with curriculum time constraints. These challenges suggest the need for comprehensive policy reforms that not only enhance PE infrastructure in rural areas but also integrate physical literacy into the academic agenda in urban schools (Joshi *et al.*, 2023; Sharma & Mathur, 2022).

The public health implications of this study are far-reaching. With early onset of lifestyle-related disorders becoming increasingly common among school-aged children, integrating physical literacy into the school curriculum offers a proactive strategy to promote long-term health. The observed rural-urban discrepancies highlight the need for location-specific interventions: rural schools may benefit from investments in structured PE and training for teachers, while urban areas require multi-sectoral efforts to curb sedentary lifestyles and promote active living through community initiatives and urban planning (Tremblay *et al.*, 2018).

Furthermore, the study advocates intersectoral collaboration among educators, health professionals, urban planners, and policymakers to design holistic, culturally-sensitive programs that nurture physical literacy across all strata of society. This aligns with global recommendations from the World Health Organization (WHO, 2020) and United Nations Educational, Scientific and Cultural Organization (UNESCO, 2015), both of which call for inclusive and equitable access to physical education as a human right and a cornerstone of health promotion.

Limitation

Despite the study's strengths in using a validated assessment tool (CAPL-2) and a balanced rural–urban sample, certain limitations should be acknowledged. The cross sectional design restricts causal inference, and the reliance on self-reported data may introduce response bias, particularly in motivation and behaviour-related items. Moreover, qualitative insights from parents, teachers, or school administrators were not included, which could have enriched interpretation.

CONCLUSION

This comparative study explored the role of physical literacy in preventing lifestyle-related disorders among rural and urban school children in Punjab and Haryana. The findings revealed significant regional disparities across the four core domains of the Canadian Assessment of Physical Literacy (CAPL-2): Physical Competence, Motivation and Confidence, Knowledge and Understanding, and Daily Behaviour. Urban students demonstrated higher scores in physical competence, motivation, and knowledge, whereas rural students surpassed their urban counterparts in daily physical activity behaviour.

These results underscore the nuanced influence of environmental, educational, and socio-cultural contexts on children's physical literacy. The urban advantage in structured knowledge and motivation may reflect

greater access to resources, trained personnel, and institutional exposure to physical education. Conversely, the rural dominance in daily behaviour suggests organically embedded activity patterns, possibly due to lifestyle or fewer sedentary alternatives. Overall, the study affirms the critical need for context-specific physical literacy interventions to bridge regional gaps and promote holistic development in school-aged children.

Future Scope

Future research should adopt longitudinal and mixed-method approaches to better understand the developmental trajectory of physical literacy and its relationship with long-term health outcomes. Incorporating physiological measures (e.g., BMI, cardiovascular fitness), exploring gender-based differences, and evaluating the impact of school- or community-based interventions will be valuable. Policymakers and educators must also consider tailoring curricula that reflect regional strengths and address gaps in physical literacy, thereby contributing to national strategies for combating childhood inactivity and non-communicable diseases.

Conflict of Interest

The authors declare that they have no conflicts of interest regarding this title: “Exploring the Role of Physical Literacy in Preventing Lifestyle-Related Disorders: a Comparative Study of Rural and Urban School Populations in Punjab and Haryana.

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