



Physical Activity among Elementary School Adolescents in Lahore: Patterns, Correlates, and Implications

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ABSTRACT

This research aimed to find out the relationship between students' participation in physical activities and its major correlates. Moreover, this study aimed to investigate the factors affecting students' participation in physical activities in public vs private school systems of Lahore. The participants of the study included both male and female students studying in grade 8 and were chosen using stratified cluster random sampling. The total sample consisted of 817 adolescents representing public and private school systems in Lahore. Physical Activity Questionnaire was used to measure physical activity of participants. The data was analyzed through SPSS 20. The findings revealed that majority of the participants had moderate PA Levels where no one was measured to be having high PA levels. Interesting results were observed for differences based on demographic characteristics including gender, parental support, physical facilities and use of screens. Recommendations are given to the school authorities to provide facilities, coaches, time slot to engage more students in physical activities.



Introduction

Patterns of physical activity (PA) established in childhood serve as the basis for adult activity behaviors. The developed and developing worlds are both dealing with the problem to the increasing number of individuals who do not engage in physical activity. Two sedentary lifestyles in childhood are linked to a high incidence of adult non-communicable diseases (NCDs), and they are a primary contributor to the global obesity crisis, which is thus associated with a rise in the death rate from cardiovascular disease.

The World Health Organization's 2020 update suggests 150–300 minutes of moderate-intensity physical exercise, or 75–150. Encourages individuals to surpass these goals by providing them with weekly

minutes of intense physical activity. When it comes to assisting individuals in making essential behavioral adjustments, healthcare practitioners play a critical role (WHO. World Health Organization Physical Activity Fact Sheet. 2020.)

A vital element of a healthy way of living, physical exercise is linked to a significant reduction in the risk of cardiovascular illnesses, which in turn helps to weight control, enhances personal fitness, and fosters mental wellness (Blair, Kohl, Gordon, & Poffenbarger, 1992; Gauvin & Spence, 1996).

PA levels are impacted by a number of sociodemographic characteristics, such as age, gender, 6-12, parental PA, peer and parental influence, time restrictions, and local influences (parks and recreation centers).. Recommendations highlight schools as important places to lay PA foundations, and important mediators for obesity prevention, where physical education (PE) lessons and playground accessibility have had the biggest beneficial effects on PA levels. Teenagers' practices of physical inactivity have a detrimental effect on the educational environment. PA outcomes have been linked to desk work, computer gaming, television viewing, and other sedentary activities.

Lack of physical activity and sedentary behavior are considered as the most significant causes of obesity. Out of the need to perform other activities that are necessary for survival, 25% of people in America are not engaged in any physical activity (Sherwood & Jeffery, 2000).

Children and young people today are less physically active and more often use screens. In HIC, adolescents from higher socioeconomic backgrounds have better activity profiles than their counterparts from low socioeconomic backgrounds; in LMIC the reverse is the case. Inequalities in physical activity levels by socioeconomic status differ according to the country context. Insufficient findings exist to suggest that adolescents' physical inactivity is a significant cause of global diseases including mental and cardio-metabolic diseases. Mental health problems and obesity may lead to inactivity and thus raise the chance of illness and death.

Weight loss advice has been fortified by the findings of a causal relationship between low physical exercise with a higher chance of gaining weight and becoming obese (Jebb & Moore, 1999; Pi-Sunier, 1993).

It is commonly acknowledged that engaging in physical activity is an essential health-promoting habit for school-age children and adolescents.

Since social and built environments play an imperative role in asserting teenage exercise, policymaking should focus on altering these prospects. School-going adolescents need to be exposed to physically active structured settings and socially beneficial supportive environments within and outside class settings for a variety of activity behaviors including sports, travel, and active play among others. Roles also similarly indicate an unequal distribution of supportive physical settings with the majority being available in HICs, but more scarce in LMICs.

Although school-based efforts have generally had little effectiveness and there is a dearth of research aimed for older teenagers (ages 15 to 19)", schools do provide an effective route for increasing physical activity among teenagers. Consistently. For these initiatives to be implemented successfully and sustainably, schools must receive assistance tailored to their particular environment. Many Youths worldwide, especially those in the 10–20 age range

Adolescent physical exercise may aid in the formation of healthy adult lives and lower the occurrence of chronic diseases. To define the ideal level of physical activity throughout adolescence, however, is to tackle several scientific conundrums. Data about the immediate and long-term health benefits of physical exercise in adolescents (Halal; Victoria, Azevedo, & wells, 2006).

Young people require physical activity and, believe it or not, the whole world knows it. As well identified by various studies, exercise enhances social, mental, and physical health during this phase of life's cycle. For instance, regular exercise is important for reducing the risk of chronic illnesses, improving mental health, and fostering social skills, according to the 2019 Smith and associates' work, "Physical Activity and Adolescent Health: A Global Perspective." The inquiry focuses on the direct physical health effects of exercising and exercise as an effective method of delaying or stopping many non-communicable diseases from developing.

Ahmed & Khan (2020) reported that Physical Activity Levels and Health Outcomes Among Adolescents in Pakistan explain the situation of Pakistani adolescents in particular. Even though much has been written on the effectiveness of exercise, the research shows that exercise rates in young people in Pakistan are quite low. Concerns of culture, environment, and socioeconomic status should also be considered to help work on this decrease in improved health.

It can be clearly stated that keeping fit is very important during the teenage period. In my case, the following benefits are well known, and everyone should engage in regular exercising so that there can be muscular strength, balanced diets, bone strength, and cardiovascular health. To riders with physical fitness, exercise is significant to their mental and emotional health. Besides reducing stress, anxiety, and depression, it promotes mood and various cognitive functions as well as working performance.

Smith et al. (2019) offer a comprehensive examination of these benefits in "Physical Activity and Adolescent Health Exploring the role that early childhood has in the formation of healthy behavioral habits. The authors argue that given the fact that young people are known to be disciplined in a way that they will follow similar or rather the same patterns even when they grow up, it becomes crucial to appeal to young people to take part in regular practices of exercising regularly. The report also shows the fact of the reduced level of physical activity among teenagers across the world due to factors like increased TV watching, increased number of families living in cities, and changes in transportation means. The authors advise the people concerned to implement fast public health measures to reverse the tide in favor of an active lifestyle.

Ahmed and Khan both concur that there are many reasons for the low level of physical activity among youthful Pakistanis. Such are the following; poor perception relating to the importance of exercise, certain cultures may prohibit or restrict some types of exercise, especially for women, and inadequate facilities and secure places for exercise. SES barriers are deemed significant because a majority of the families do not have the means to make payments to cater for their children in sports or other activities.

Parents and scientists have expressed concern with the observation that the number of teenagers now doing regular physical activity has dropped despite the tremendous significance of the activity. As a result of this decline, there are quite a number of health negative outcomes for the people such as high incidences of heart diseases, diabetes, obesity as well as mental health diseases like anxiety and depression. There are several causes to this effect: increased screen time (TV, PC, Smartphone), possibility of fewer safe places to exercise due to elevated rates of urbanization, and more inclination to sedentary activities.

Lahore is relatively one of the big cities where such problems could be in different extent than in other cities and may influence the amount of exercise among teenagers. That is, cultural beliefs about exercise, concerns regarding the availability of venues to relax safely, and even variations in health-orientated attitudes within families. To analyze effectiveness of different solutions it is necessary to review specific local conditions of Lahore since area may play significant role influencing possible outcomes.

Frequent physical activity (PA) is essential for avoiding a number of illnesses and fostering adolescent mental and physical health and well-being (Centre for Disease Control and Prevention [CDC], . Improved cardio-respiratory fitness, stronger muscles, less symptoms of anxiety and sadness, and a lower chance of contracting a number of non-communicable illnesses are all linked to physical exercise. Additionally, social contact and community participation are enhanced by increased physical activity.

Physical activity patterns of people are thus determined by factors that are twined in a manner that cannot be easily separated. An everyday personal habit would be a child's tendency to play sports or the tendency to use a cellular phone. Other independent variables are contextual and sociodemographic such as age and gender and the monthly family income. An understanding of these factors would therefore assist in finding out factors that may be supportive or non-supportive of adolescents' physical activity in Lahore.

Although little research has been done on the prevalence of PA in Pakistani teenagers, no comprehensive review or meta-analysis of the prevalence and trends of PA in Pakistani teenagers has been done as of yet. A meta-analysis was absent from two of the reviews that were found during the literature search. Only one study from Pakistan was included in the first of the aforementioned, a systematic review that reported on the lack of PA among South Asians aged 25 to 64 (Ranasinghe et al., 2013). The second was

a narrative review that assessed the prevalence of PA in Asian school-age children and adolescents. Two South Asian studies—one from India and the other from Sri Lanka—were included in the aforementioned review. However, the review did not include any research from Pakistan.

However, research has clearly shown its numerous benefits, a significant number of individuals still take inadequate amounts for their recommended dietary allowance. This century has witnessed developments in physicians' advice and treatment of patients with first-contact attendance. It is called a 'Green Prescription' which is a doctor's referral for exercise for a patient. Many researches have shown the extent to which it has influenced the improvement of.

For this reason emphasis on the benefits accruing from physical exercise boosted the research on the physical health improvement precipitated by besides mental health and other mental health-related factors, physical activity (McAuley, 1994; McAuley & Rudolph, 1995; Alfermann & Stoll, 2000; Fox, 2000).

Modernization and growth of population density in metropolitan places has caused change in living patterns more and more people are glued to television. Living a life of indoor confinement and being immobile is gradually reducing This has resulted into high prevalence of obesity, CVDs, infectious diseases and NDs including those in Asian country of Pakistan.

The current study was planned to assess PA levels and its correlates among elementary school adolescents.

Objectives

Following were the main objectives of the study

- To find out the relationship between participation in physical activities in students and its major correlates (Age, gender, grade level, Type of School)
- To investigate the factors affecting students' participation in physical activities in public vs private school systems of Lahore.
- To explore the effect of student's demographic characteristics on their participation in physical activities

Research Questions

- What is the relationship between student's physical activities and their demographic characteristics (e.g. Age, gender, grade level, Type of School, performance)?
- What aspects of student's demographic variables social, cultural, and environmental life have links to PA levels?
- What is the level of student participation in physical activities in public and private schools?
- Which factors (demographic) influence students' participation in physical activities in public vs private schools?

Literature review

Physical activity is any skeletal muscle-driven movement that expands energy, including activities such as sports, recreation, and daily routines (Christenson, Powell, & Caspersen, 1985). It highlights the complex nature of PA, noting its physical, mental, and social benefits. Engaging in regular PA can lead to improved muscular strength, cardiovascular health, weight management, and mental well-being (Doherty & Miravalle, 2019; Åvitsland & Leibinger, 2020). Furthermore, PA contributes to better academic performance, resilience, and social skills development, which are crucial during adolescence (Donnelly & Lambourne, 2011; Resaland et al., 2016).

PA categorizes into various forms, including physical education, sports, aerobic exercises, muscle-strengthening activities, bone-fortifying exercises, leisure pursuits, active mobility, and active transportation (Centres for Disease Control and Prevention, 2013; Loprinzi & Trost, 2008; Castillo et al., 2008; Turner & Figueroa, 2019). Each type offers unique benefits, from enhancing cardiovascular endurance to fostering teamwork and social interaction. For instance, aerobic activities like running and swimming improve endurance, while resistance training builds muscular strength, and weight-bearing exercises support bone

health, especially vital during adolescence (Loprinzi & Trost, 2008; Castillo et al., 2008; Bailey et al., 1999). PA during childhood fosters physical, mental, and emotional health, reducing risks associated with non-communicable diseases (Janssen & LeBlanc, 2010). WHO recommends at least 60 minutes of moderate-to-vigorous PA daily for children and adolescents to combat obesity and promote overall well-being (Pierre et al., 2022). However, the review notes that despite these benefits, PA levels are declining globally due to lifestyle changes, increased screen time, academic pressures, and environmental barriers (Guthold et al., 2020; Hallal et al., 2012). Socioeconomic status (SES), cultural norms, and urbanization significantly influence participation rates, with disparities observed between genders, urban and rural areas, and socioeconomic groups (Brodersen et al., 2007; Sallis, Prochaska, & Taylor, 2000).

In the context of Lahore, Pakistan, where rapid urbanization, cultural norms, safety concerns, and infrastructural deficits challenge PA promotion among adolescents. Studies reveal low participation rates, especially among girls, due to gender norms, lack of safe recreational spaces, and academic priorities (Ali et al., 2018; Baig et al., 2015). Urbanization has led to a reduction in open spaces, increased traffic, and safety issues, further discouraging outdoor activities (Ghaffar et al., 2015; Sarmad et al., 2020). Socioeconomic disparities influence access to facilities, with wealthier families having more opportunities for organized sports (Awan et al., 2019). Cultural and social stigma also restrict girls from participating fully in PA, emphasizing the need for culturally sensitive interventions.

Various barriers, including time constraints due to academic workload, lack of infrastructure, safety concerns, and cultural restrictions hinder participation in physical activities (Ahmad et al., 2017; Khan et al., 2017). It advocates for school-based interventions such as structured physical education programs and policy-level initiatives like urban planning for active transportation and recreational facilities (CDC, 2017; Tammelin et al., 2014). Successful examples from other countries demonstrate the importance of integrating PA into daily routines through government policies, community engagement, and infrastructural development.

This descriptive study was conducted in public and private schools in different zones of Lahore, from August 2024 to March 2025. Using the WHO software with 7% bound of error and the level of significance at 5%, the estimated final sample size was 817 after addition of 10% for non-responders.

Stratified cluster random sampling was used to select respondents (grade VIII) from Public and private schools of Lahore.

Adolescent PA levels were assessed using a nine-item validated Physical Activity Questionnaire for older children (PAQ-C) Questionnaire. Of the nine items, one is related to any illness in the last week and eight are related to PA. The PA levels are categorized as low, moderate or high when the PA scores on these eight items are one, two to four, or five or more, respectively. The self-administered questionnaire consisted of demographic data (type of school, age, gender, grade, parental education, mother's employment), PAQ-C, and other PA-related factors (parental support for PA, parental PA, siblings' PA, availability of playground in schools and neighborhood, arrangement of PE classes in the school and community recreational centers). Sedentary activities such as watching TV/videos, listening to music, playing computer-games, using computer/internet, reading books, doing homework, talking on the phone, playing cards and playing indoors with toys were also included.

The PAQ-C is a seven-day recall questionnaire, with a 5- point Likert-type scale. It measures MVPA, has been validated for schoolchildren and adolescent aged 8-14 years, and it evaluates PA levels and frequency of participation in different types of activities. The PAQ-C had to be modified to represent common activities of children and adolescents in Lahore, Pakistan (cricket replaced 'rowing, tagging, baseball, dancing, American football, skateboarding, volleyball, ice hockey and cross country skiing'). One of the questions regarding activities during lunch time was not included as most of the schools in Pakistan either have only recess time, as children return home for lunch. The modified version was piloted in one of the schools and no changes were suggested.

Cronbach's alpha was used to assess the reliability of the tests evaluating physical activities and their correlations. Cronbach alpha reliability evaluation adds to the average rating of assessment reliability. The

findings' credibility is increased by internal consistency, which confirms that the check items consistently gauge the physical activity of eighth-grade students.

Table 1. Reliability Coefficient of the Tool

Items	No of items	Cronbach alpha
Physical activity and their correlates	23	.83

The high reliability of the scales, as indicated by the Cronbach alpha score of .83. The typical range of the dependability coefficient is 0 to 1. The more closely the coefficient resembles 1.0, the more internally consistent the items.

Data was analyzed using SPSS software for social sciences. Mean scores of all activities in the questionnaire (PAQ-C) were taken as the PA levels of the school-adolescents, and the mean PA scores were then categorized as low, moderate or high as per defined criteria.

Table 2. Classification of Physical Activity Levels

PA Level	Criteria
Level 1	At least 60 minutes of moderate physical activity every day
Level 2	At least 60 minutes of physical activity on 4–6 days per week
Level 3	At least 30 minutes of physical activity per day
Level 4	At least 30 minutes of moderate physical activity on at least 5 days per week
Level 5	At least 30 minutes of moderate to vigorous physical activity on at least 3 days per week

Adapted from WHO (2010, 2020) and U.S. Department of Health and Human Services (2018) as cited in Jabeen et al., (2018)

Descriptive analyses included frequency and percentage for qualitative variables, and means and standard deviations (SD) for quantitative variables. Pearson Chi-square test was used to analyze the correlation between levels of PA and socio-demographic factors (categorical variables). Binary logistic regression was applied and results were reported in the form of unadjusted and adjusted odds ratio with 95% Confidence Interval (CI).

Results

The finding of the study revealed that about 24% of the total sample of teenagers had low PA Levels whereas 76 % had moderate with no one having elevated PA levels. Male, public school type, parental support, and—interestingly—those who engaged in indoor play were all shown to be positively connected with higher PA levels.

Table 3. PA Levels among elementary school adolescents

Physical activity levels	Frequency (n)	Percentage (%)
Moderate PA	621	76.0
Low PA	196	24.0
Total	817	100.0

This study found that the gender gap in PA levels was more noticeable between public schools 69.4%. and private schools (30.6%). The boys and girls were less physically active in private school as compared to public school. This study found that the key determinant of PA Levels is being male 56.1%. The results showed that girls 43. % were less physically active than boys. Higher PA levels were shown to positively correlate with parental support as well.

Another statistically significant predictor of greater PA levels among adolescents was to attend public schools approaching 83 % of the total sample that seemed to be according to this study, was the presence of school playgrounds. The lack of playgrounds in private schools that is 16.5% may be the cause of the lower PA levels among teenagers attending these institutions.

This study found that (85.6%) reported listening to music to have different physical activity patterns compared to those who do not, while (14.3%) did not listen to music. The students (83.8%) played computer games and 129 (15.8%) did not. Since the p-value is greater than 0.05, there is no statistically significant relationship between playing computer games and physical activity levels. Among the students, (80.7%) reported reading books, while (19.0%) did not. This indicates a statistically significant relationship between reading books and physical activity levels.

Variable	Category	Frequency(n)	Percentage (%)	Chi –square	P value	Interpretation
School type	Public	567	69.4%	90.188	0.000	Significant
	Private	250	30.6%			
Gender	Male	458	56.1%	0.552	0.04	Significant
	Female	359	43.9%			
Parental support	yes	734	89.7%	52.259	0.000	Significant
	No	82	10.0%			
Playground availability	Yes	682	83%	52.283	0.000	Significant
	No	135	16.5%			
Listening to music	Yes	699	85.6%	11.249	0.004	Significant
	No	117	14.3%			
Playing computer games	Yes	685	83.8%	3.150	0.369	Not significant
	no	129	15.8%			
Reading books	Yes	659	80.7%	37.609	0.000	Significant
	No	155	19.0%			

A vast proportion of the sample approximately 89.7% of the total sample reported parental support was a major factor which promote and facilitate physical activity. This support should encompass active encouragement, the supply of gadgets, and transportation to promote and maintain physical activity.

A tiny portion of scholars lack parental support, which might also result in demanding situations including a lack of budget, or chances for workouts. Parental help is a big element influencing the physical activity of young people. Though, confirmed by way of the lack of support for even 10% of the pattern, targeted interventions are required to cope with those hurdles. Most school students get hold of parental help,

which emphasizes the importance of parental guidance as a main predictor of physical activity but to provide equitable entry to physical interest opportunities, 10% of individuals without help constitute a susceptible organization that may require community-stage or school-primarily based interventions.

Factors which were found as positive correlates of PA (Physical Activity), in decreasing order of significance were public schools (0.000), parental support (0.000), listening to music (0.004), availability of playground (0.000), doing homework (0.000), indoors toys (0.02), and reading books (0.000).

Analyzing data for public and private schools separately showed that seven factors significantly correlated with PA, however two other factors gender and playing computer games did not found to be having significant correlation with PA levels ($p < 0.05$ each).

Variable	Unadjusted Odds Ratio (UOR)	P-value (UOR)	Adjusted Odds Ratio (AOR)	P-value (AOR)	95% Confidence Interval (AOR)
School (1)	4.282	0.000	0.234	0.000	0.140–0.391
Parental support (1)	0.000	1.000	0.399	0.002	0.223–0.716
Parental support (2)	0.000	1.000	56531487.84	1.000	-
Listening to music (1)	1.148	1.000	0.860	0.596	0.493–1.501
Listening to music (2)	1.127	1.000	423661409.6	1.000	-
Playground (1)	1.792	0.032	0.558	0.032	0.328–0.950
Homework (1)	1.496	0.297	0.668	0.297	0.313–1.426
Indoors (1)	0.000	1.000	0.456	0.009	0.276–0.755
Games (1)	0.000	1.000	0.852	0.590	0.477–1.523
Books (1)	0.000	1.000	0.766	0.307	0.459–1.278
Gender (1)	0.815	0.395	1.227	0.395	0.766–1.963

Binary logistic regression results found that Physical interest is consistently now not drastically correlated with elements which include gender, homework, video games, literature, and tune listening. This suggests that the unadjusted odds ratio may additionally overestimate the influence of school and playground accessibility. Using adjusted odds permits a deeper comprehension of widespread determinants (which include indoor sports and parental support).

Elementary schools in Lahore (n=817)

Grade: VIII

Gender: Male 458(56.1%) FEMALE 359(43.9%)

PA Levels (overall): High :None Moderate :621(76%) 196(24%)

Private sector schools
(n=250)

Gender Male :140 (56%)

Female :110(44%)

Public sector schools
(n=567)

Gender Male :318 (56%)

Female :249(44%)

Levels of PA

High levels: None

**Moderate levels
:214(85.6%)**

Low levels :36(14.4%)

Levels of PA

High levels: None

**Moderate levels
:407(71.8%)**

Low levels :160(28.2%)

**Factors positively
correlated with PA: Chi square
analysis**

Playing computer games

**Factors positively correlated
with PA: Chi square analysis**

**Boys, parental support of
children, listening music ,reading
books**

Factors positively correlated with PA

Chi square analysis of whole data

**Public school Male gender, parental support of children, listening music
,reading books ,**

Discussion

The major objective of the study was to find out the relationship between students' participation in physical activities and its major correlates (Age, gender, grade level, type of school, performance). The finding showed that about 24% respondents had low PA Levels whereas 76 % had moderate with no one having elevated PA levels. Male, public school type, parental support, and—interestingly—those who engaged in indoor play and schooling were all shown to be positively connected with higher PA levels. The study's findings aligned with those of Demuth (2010), who found that physical activity (PA) declines during the course of life, particularly during adolescence. Students miss out opportunities for physical activity since they are under academic pressure and are solely focused on their studies.

This study found that the key determinant of PA Levels is being male. Similarly, the results also found that girls were less physically active than boys. This finding is found to be aligned with the previous research of Sallies et al (2000). Their study showed that social-environmental factors, such as parental support to boys more than girls to participate in physical activity, was the main reason. However, the main factors influencing females' lower levels of sports participation were lack of education, cultural barriers to modesty, or girls' avoidance of mixed-gender physical activities.

The investigation of the factors influencing students' engagement in physical activities in Lahore's public vs private school systems was another goal of the study. The results showed that in both of the public and private sectors, around 76% of teenagers had moderate PA levels. In contrast to the private sector, the public sector has a larger share of intermediate levels. About 24%, had low levels in both areas. Higher PA levels were shown to positively correlate with parental support, a finding that van der Horst et al. (2007) further supports. They clarified that sex (male), self-efficacy, parental PA (for boys), and parental support were among the elements that were positively connected with children's PA. According to Trost and Loprinzi (2011), parents have the most impact on their kids' activity-related behavioral patterns, such as participation in sports, outdoor play, and exercise. Among them, the presence of social support, such as indirect verbal and nonverbal encouragement, has a favorable effect on the activity levels of kids and teens (Sallis et al., 2000). Parental actions that involve providing emotional support have been shown to be favorably connected with children's PA levels (Trost et al., 2003).

This study found that the gender gap in PA levels was more noticeable between public schools and private schools. The boys and girls were less physically active in private school as compared to public school. The findings of study was consistent with the findings of Fredricks & Eccles, (2005) which found that Boys seem to get greater parental encouragement to be active than girls.

Another statistically significant predictor of greater PA levels among adolescents attending public schools, according to this study, was the presence of school playgrounds. The lack of playgrounds in private schools may be the cause of the lower PA levels among teenagers attending these institutions. The study's findings were in line with those of Ferreira (2007), who discovered that resources and extracurricular activities differed between public and private schools.

This study found that teenagers in public schools who read books did their schoolwork, and listened to music were more physically active because they finished their assignments earlier and engaged in physical exercise. While those who did not do their homework did not engage in physical activity.

This study found that students attending public and private schools, playing computer games were not shown to be substantially correlated with PA levels. The results of the study were inconsistent with respect to the association between PA levels and the usage of technology and multimedia. Screen-based activities decreased PA, according to Gharaham et al.'s study; Lubans et al. did not find this correlation.

Conclusion

It was observed that students in public schools were more actively involved in physical activities compared to students in private schools. Government-funded schools play a crucial role in shaping students' physical activity behaviors, often offering better infrastructure, structured physical education programs, and greater emphasis on extracurricular activities. In contrast, adolescents in private schools may face challenges

in maintaining adequate levels of physical activity due to limited facilities, unstructured physical education, and less focus on extracurricular engagement. These differences highlight the significant disparities between public and private schools in terms of infrastructure, access to sports opportunities, and the prioritization of physical education. Although both boys and girls participate in physical activities, boys often have greater opportunities to do so. Boys are therefore more likely to have access to play areas, sports programs, and other resources that encourage physical activity, such as outdoor games or sports teams. Boys are frequently free to engage in these activities due to cultural norms, however girls may be subject to greater restrictions. These restrictions may result from cultural beliefs about what females should or shouldn't do, safety concerns, or a lack of encouragement for girls to be active.

Children who get encouragement and support from their parents are more likely to engage in physical activities. This assistance can take the form of urging them to participate in sports or assisting them in getting to locations that encourage physical activity. However, youngsters who don't have parental support for their physical activities tend to be less active. Therefore, parents have a big part to play in keeping their children active.

Higher levels of physical activity were shown to be strongly positively correlated with enrollment in public schools. Male students participated more often than female students, indicating gender disparities and the persistent social and cultural hurdles that prevent girls from engaging in physical exercise. This study found that the existence of school playgrounds was another statistically significant predictor of higher PA levels among adolescents attending public schools. Teenagers who attend private schools may have lower PA levels due to the absence of playgrounds at these establishments. Teenagers in public schools who read books did their schoolwork, and listened to music were more physically active because they finished their assignments earlier and engaged in physical exercise.

Recommendations

- Schools should incorporate regular physical education lessons into the curriculum to guarantee that every student engages in physical activities, regardless of their academic standing or background.
- School development authorities should ensure that private schools have playgrounds before granting approval, while working on improving the facilities in private schools.
- Schools should provide -wide sporting activities that are only for females to give them a chance to show off their abilities in physical activities.

References

- Ahamed, Y., Reed, K., Naylor, P. J., McKay, H. A., & Mauseth, D. S. (2007). School-based physical activity does not compromise children's academic performance. *Medicine and Science in Sports and Exercise*, 39(2), 371–376.
- Ahmed, J., Mehraj, V., Jeswani, G. K., Shah, S. M., & Hamadeh, R. (2016). Parental and school influences on physical activity levels of high school students in Hyderabad, Pakistan. *Journal of Ayub Medical College*, 28(1), 110–115.
- Ahmed, S., & Khan, M. A. (2020). *Physical activity levels and health outcomes among adolescents in Pakistan*. Pakistan Journal of Public Health, 10(2), 85–92.
- Ajzen, I. (1991). *The theory of planned behavior*. Organizational Behavior and Human Decision Processes, 50(2), 179-211.
- Alfermann, D., & Stoll, O. (2000). Effects of physical exercise on self-concept and well-being. *International Journal of Sport Psychology*, 31(1), 47–65.
- Ali, S. I., & Yousaf, A. (2018). Barriers to physical activity for children in Lahore, Pakistan: A parental perspective. *International Journal of Physical Activity and Health*, 25(2), 132–140. <https://doi.org/10.1111/jphs.12229>
- Slater, A., & Tiggemann, M. (2010). "I'll have what she's having": The impact of peer influence on the exercise behaviors of adolescent girls. *Body Image*, 7(3), 191–197.

<https://doi.org/10.1016/j.bodyim.2010.01.004>

- Ali, S. I., Yousaf, A., & Aslam, M. (2018). Gender-specific cultural barriers to physical activity for adolescent girls in Pakistan. *International Journal of Adolescent Medicine and Health*, 30(2), 177–184. <https://doi.org/10.1515/ijamh-2016-0159>
- Ali, S., Khan, A., & Awan, N. (2018). Obstacles to physical activity faced by schoolchildren in Lahore. *Journal of Pakistani Medical Sciences*, 34(4), 987-991.
- Awan, H. M., Usman, M., & Khalid, M. (2019). *Socioeconomic disparities in physical activity access and participation among adolescents in Lahore*. *Journal of Physical Activity and Health*, 16(9), 789-794.
- Awan, S. A., Shah, S. K., & Ghaffar, A. (2019). Urbanization and physical activity among adolescents in Lahore. *Pakistan Journal of Public Health*, 9(2), 105-111.
- Baig, A., Qureshi, A., & Rizvi, S. A. (2015). Sedentary behaviors and physical activity levels among school-aged children in Lahore, Pakistan. *Journal of Urban Health*, 92(5), 903–910. <https://doi.org/10.1007/s11524-015-9978-2>
- Baig, M. I., Hasan, S. R., & Ali, M. (2015). *Urbanization and physical activity patterns among adolescents in Lahore*. *Journal of Urban Health*, 92(3), 467-475.
- Baig, M., Rahim, M., & Shah, R. (2015). A survey of physical activity barriers among urban adolescents in Lahore. *Pakistan Journal of Physical Education*, 5(3), 211-218.
- Baig, S. M., Ghaffar, A., & Riaz, M. (2015). Physical activity levels among school children in Lahore: Barriers and facilitators. *Journal of Sports Sciences*, 3(2), 45-52.
- Bailey, D. A., Faulkner, R. A., & McKay, H. A. (1999). Growth, physical activity, and bone mineral acquisition. *Exercise and Sport Sciences Reviews*, 27, 233–266.
- Bailey, R. (2006). *Physical education and sport in schools: A review of benefits and outcomes*. *Journal of School Health*, 76(8), 401-407.
- Bailey, R., & Pickard, L. (2010). Physical education, physical activity, and sport in schools: A review of the literature on policy and practice. *European Physical Education Review*, 16(3), 291–311.
- Bandura, A. (2001). *Social cognitive theory: An agentic perspective*. *Annual Review of Psychology*, 52(1), 1-26.
- Bauman, A. E., Reis, R. S., Sallis, J. F., Wells, J. C., Loos, R. J., & Martin, B. W. (2012). Correlates of physical activity: Why are some people physically active and others not? *The Lancet*, 380(9838), 258–271. [https://doi.org/10.1016/S0140-6736\(12\)60735-1](https://doi.org/10.1016/S0140-6736(12)60735-1)
- Bauman, A., Bull, F., & Chey, T. (2012). *The role of the built environment in shaping physical activity levels of youth*. *Journal of Urban Health*, 89(6), 1127-1140.
- Bauman, A., Reis, R. S., Sallis, J. F., Wells, J. C., & Lopez, R. (2012). Correlates of physical activity in children and adolescents. *Journal of Physical Activity & Health*, 9(6), 577-586. <https://doi.org/10.1123/jpah.9.6.577>
- Bauman, A., Sallis, J. F., & Dziewaltowski, D. (2012). Perspectives on physical activity promotion in urban settings. *Urban Health Journal*, 2(1), 15-23.
- Baur, L. A., & McDermott, R. J. (2019). The role of physical activity in bone health: Bone strengthening and prevention of osteoporosis. *International Journal of Sports Science & Coaching*, 14(2), 227-235.
- Benítez-Andrades, J. A. (2020). Feasibility of social-network-based eHealth intervention on the improvement of healthy habits among children. CSEdResearch.org. <https://csedresearch.org/social-cognitive-theory/>
- Blair, S. N., Kohl, H. W., Gordon, N. F., & Paffenbarger, R. S. (1992). *How much physical activity is good for health?* *Annual Review of Public Health*, 13, 99–126.
- Brockman, R., Jago, R., & Fox, K. R. (2011). "Get off the sofa and play!": A qualitative study of factors influencing children's physical activity. *Health Education Research*, 26(2), 101-109. <https://doi.org/10.1093/her/cyr017>
- Brodersen, N. H., Steptoe, A., & Boniface, D. R. (2007). *Socioeconomic status and physical activity among adolescents: A study of the English Longitudinal Study of Aging*. *Social Science & Medicine*, 65(10),

- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Harvard University Press.
- Budzyna, D., & Buckley, D. (2023). Ecological theory. Pressbooks. <https://rotel.pressbooks.pub/whole-child/chapter/ecological-theory-2/>
- Caspersen, C. J., Powell, K. E., & Christenson, G. M. (1985). Physical activity, exercise, and physical fitness: Definitions and distinctions for health-related research. *Public Health Reports*, 100(2), 126–131.
- Centers for Disease Control and Prevention. (2013). *Comprehensive school physical activity programs: A guide for schools*. Atlanta, GA: U.S. Department of Health and Human Services.
- Centers for Disease Control and Prevention. (2013). Physical activity guidelines for Americans. CDC. <https://www.cdc.gov/physicalactivity/basics/index.htm>
- Centre for Disease Control and Prevention. (2018). CDC Health Schools. Physical activity facts. National Center for Chronic Disease Prevention and Health Promotion, USA. Retrieved April 9, 2018, from <https://www.cdc.gov/healthyschools/physicalactivity/facts.htm>(open in a new window)
- Ch Zhen, C., Moor, S., Pickett, W., & Stevens, M. (2016). *Cultural attitudes towards physical activity and sports in adolescents: A cross-cultural comparison*. *International Journal of Adolescence and Youth*, 21(1), 85-96.
- Champion, V. L., & Skinner, C. S. (2008). *The Health Belief Model*. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), *Health behavior and health education: Theory, research, and practice* (4th ed., pp. 45-65). Jossey-Bass.
- Cohen, D. A., McKenzie, T. L., Sehgal, A., Williamson, S., & Golinelli, D. (2007). Contribution of public parks to physical activity. *American Journal of Public Health*, 97(3), 509–514. <https://doi.org/10.2105/AJPH.2005.072447>
- Cohen, D., Ashwood, J. S., & Golinelli, D. (2007). The influence of neighborhood safety on children's outdoor activity. *American Journal of Public Health*, 97(11), 2044-2050.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. Springer Science & Business Media.
- 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.
- Demuth, A. (2010). The influence of physical activity on health and quality of life in adolescence. *Acta Facultatis Educationis Physicae Universitatis Comenianae*, 50(2), 19–31.
- Di Cesare, M.; Sorić, M.; Bovet, P.; Miranda, J.J.; Bhutta, Z.; Stevens, G.A.; Laxmaiah, A.; Kengne, A.-P.; Bentham, J. The epidemiological burden of obesity in childhood: A worldwide epidemic requiring urgent action. *BMC Med.* **2019**, *17*, 212.
- Ding, D.; Sallis, J.F.; Kerr, J.; Lee, S.; Rosenberg, D.E. Neighborhood Environment and Physical Activity Among Youth. *Am. J. Prev. Med.* **2011**, *41*, 442–455.
- Dobbins, M., Husson, H., DeCorby, K., & LaRocca, R. L. (2013). School-based physical activity programs for elementary-aged children: A meta-analysis. *Preventive Medicine*, 56(5), 312–317. <https://doi.org/10.1016/j.ypmed.2013.01.011>
- Donnelly, J. E., & Lambourne, K. (2011). Classroom-based physical activity, cognition, and academic achievement. *Preventive Medicine*, 52(Supplement), S36–S42.
- Donnelly, J. E., Hillman, C. H., Castelli, D., Etnier, J. L., Lee, S., Tomporowski, P. D., Lambourne, K., & Szabo-Reed, A. N. (2016). Physical activity, fitness, cognitive function, and academic achievement in children: A systematic review. *Medicine and Science in Sports and Exercise*, 48(6), 1223–1234.
- Edwardson, C. L., & Gorely, T. (2010). Parental influences on adolescent physical activity: A review. *European Physical Education Review*, 16(2), 243–267. <https://doi.org/10.1177/1356336X10364605>
- Eime, R. M., Young, J. A., Harvey, J. T., & Charity, M. J. (2013). The psychological and social benefits of participation in sport for children and adolescents: A review. *The Journal of Sports Medicine and*

Physical Fitness, 53(3), 157–163.

- Ekelund, U., Luan, J., Sherar, L. B., Esliger, D. W., Griew, P., Cooper, A., & International Children's Accelerometry Database (ICAD) Collaborators. (2012). Moderate to vigorous physical activity and sedentary time and cardiometabolic risk factors in children and adolescents. *JAMA*, 307(7), 704–712. <https://doi.org/10.1001/jama.2012.156>
- Ferreira, I., van der Horst, K., Wendel-Vos, W., Kremers, S., van Lenthe, F. J., & Brug, J. (2007). Environmental correlates of physical activity in youth – A review and update. *Obesity Reviews*, 8(2), 129–154. <https://doi.org/10.1111/j.1467-789X.2006.00264.x>
- Fox, K. R. (2000). The effects of exercise on self-perceptions and self-esteem. In S. J. H. Biddle, K. R. Fox, & S. H. Boutcher (Eds.), *Physical activity and psychological well-being* (pp. 88–117). Routledge.
- Fredricks, J. A., & Eccles, J. S. (2005). Family socialization, gender, and sport motivation and involvement. *Journal of Sport and Exercise Psychology*, 27(1), 3–31. <https://doi.org/10.1123/jsep.27.1.3>
- Gauvin, L., & Spence, J. C. (1996). *Physical activity and psychological well-being: Knowledge base, current issues, and caveats*. *Nutrition Reviews*, 54, S53–S65
- Ghaffar, A., Awan, S. A., & Shah, S. K. (2015). Urban environment and physical activity in Lahore. *Pakistani Journal of Urban Studies*, 4(1), 33–40.
- Ghaffar, A., Raza, S., & Akram, H. (2015). Urbanization and its impact on physical activity patterns among adolescents in Lahore. *Environmental Health Perspectives*, 123(10), 1046–1054. <https://doi.org/10.1289/ehp.1500301>
- Ghaffar, A., Reddy, K. S., & Singhi, M. (2015). Burden of non-communicable diseases in South Asia. *BMJ*, 328(7443), 807–810. <https://doi.org/10.1136/bmj.328.7443.807>
- Gupta, N., Goel, K., Shah, P., & Misra, A. (2012). Childhood obesity in developing countries: Epidemiology, determinants, and prevention. *Endocrine Reviews*, 33(1), 48–70. <https://doi.org/10.1210/er.2010-0028>
- Guthold, R., Stevens, M., & Riley, L. (2020). *Global physical activity levels in adolescents: Findings from 146 countries*. *Lancet*, 396(10257), 1184–1194.
- Hallal, P. C., Andersen, L. B., Bull, F. C., Guthold, R., Haskell, W., & Ekelund, U. (2012). Global physical activity levels: Surveillance progress, pitfalls, and prospects. *The Lancet*, 380(9838), 247–257. [https://doi.org/10.1016/S0140-6736\(12\)60646-1](https://doi.org/10.1016/S0140-6736(12)60646-1)
- Hallal, P. C., Victora, C. G., Azevedo, M. R., & Wells, J. C. K. (2006). Adolescent physical activity and health: A systematic review. *Sports Medicine*, 36(12), 1019–1030. <https://doi.org/10.2165/00007256-200636120-00003>
- Jago, R., Baranowski, T., & Thompson, D. (2011). Social influences on physical activity and its role in childhood obesity prevention. *American Journal of Preventive Medicine*, 41(3), 172–182. <https://doi.org/10.1016/j.amepre.2011.04.009>
- Janssen, I., & LeBlanc, A. G. (2010). Cohort profile: Physical activity, urban youth, and health (PHYUH) study of inactive girls and boys in Newfoundland, Canada. *International Journal of Behavioral Medicine*, 17(3), 234–241.
- Janssen, I., & LeBlanc, A. G. (2010). Systematic review of the health benefits of physical activity and fitness in youth. *International Journal of Behavioral Nutrition and Physical Activity*, 7(1), 40.
- Jebb, S. A., & Moore, M. S. (1999). *Contribution of a sedentary lifestyle and inactivity to the etiology of overweight and obesity: Current evidence and research issues*. *Medicine & Science in Sports & Exercise*, 31(Suppl. 1), S534–S541.
- Katzmarzyk, P. T., Pate, R. R., Connor Gorber, S., & Tremblay, M. S. (2016). Systematic review of the relationships between objectively measured physical activity and health indicators in school-aged children and youth. *Applied Physiology, Nutrition, and Metabolism*, 41(6 Suppl 3), S197–S239. <https://doi.org/10.1139/apnm-2015-0663>
- Kayhan, R.F.; Bayrakdaroglu, S.; Ceylan, H.I.; Eken, O.; Bayrakdaroglu, Y.; Badicu, G.; Al-Mhanna, S.B.; Enoiu, R.-S.; Ardigo, L.P. Effects of different rest intervals in high intensity interval training

programs on VO₂max, body composition, and isokinetic strength and power.

- Khan, A., Uddin, R., Salam, R. A., & Zafar, T. (2017). Gender disparities in physical activity among Pakistani adolescents: A qualitative exploration. *BMC Public Health*, 17(1), 670. <https://doi.org/10.1186/s12889-017-4679-x>
- Khan, M. J., Malik, S., & Zafar, S. (2017). Barriers to physical activity among adolescents in Lahore: A qualitative study. *BMC Public Health*, 17, 567.
- Khan, M. R., Rauf, S. U., & Iqbal, N. (2017). *Impact of cultural norms, gender roles, and academic pressures on physical activity levels in Lahore's youth*. *Asian Journal of Education and Development*, 5(2), 58-62.
- Khan, M. S., Khalid, R., & Sarwar, M. (2017). Safety concerns and the physical activity of adolescent girls in Pakistan: The impact of unsafe neighborhoods. *Journal of Adolescence*, 58, 72–80. <https://doi.org/10.1016/j.adolescence.2017.06.003>
- Khan, S., Ali, Z., & Hassan, F. (2017). Gender differences in physical activity among adolescents in Lahore, Pakistan. *International Journal of Adolescent Medicine and Health*, 29(5), 557-563. <https://doi.org/10.1515/ijamh-2017-0025>
- Lee, I.-M., Shiroma, E. J., Lobelo, F., Puska, P., Blair, S. N., & Katzmarzyk, P. T. (2012). Effect of physical inactivity on major non-communicable diseases worldwide: An analysis of burden of disease and life expectancy. *The Lancet*, 380(9838), 219–229. [https://doi.org/10.1016/S0140-6736\(12\)61031-9](https://doi.org/10.1016/S0140-6736(12)61031-9)
- Lee, P. H., Macfarlane, D. J., & Lam, T. H. (2012). Effects of physical activity on cardiovascular risk factors in adolescents. *Journal of Cardiovascular Nursing*, 27(2), 119-127.
- Lobstein, T., Baur, L., & Uauy, R. (2004). Obesity in children and young people: A crisis in public health. *Obesity Reviews*, 5(Suppl 1), 4–85. <https://doi.org/10.1111/j.1467-789X.2004.00133.x>
- Lobstein, T., Baur, L., & Uauy, R. (2004). Obesity in children and young people: A crisis in public health. *Obesity Reviews*, 5(Suppl 1), 4-85.
- Loprinzi, P. D., & Trost, S. G. (2008). Physical activity, fitness, and academic achievement. *Journal of Physical Activity and Health*, 5(1), 76–88.
- Lounsbery, M. A., McKenzie, T. L., & Trost, S. G. (2011). The importance of physical education for promoting physical activity in children. *Research Quarterly for Exercise and Sport*, 82(1), 57–64. <https://doi.org/10.1080/02701367.2011.10599706>
- Lubans, D. R., Boreham, C. A., Kelly, P., & Foster, C. E. (2011). The relationship between active travel to school and health-related fitness in children and adolescents: A systematic review. *International Journal of Behavioral Nutrition and Physical Activity*, 8, 5. <https://doi.org/10.1186/1479-5868-8-5>
- Mandolesi, L., Polverino, A., Montuori, S., Foti, F., Ferraioli, G., Sorrentino, P., & Sorrentino, G. (2018). Effects of physical exercise on cognitive functioning and well-being: Biological and psychological benefits. *Frontiers in Psychology*, 9, 509.
- Mears, R.; Jago, R. Effectiveness of after-school interventions at increasing moderate-to-vigorous physical activity levels in 5- to 18-year olds: A systematic review and meta-analysis. *Br. J. Sports Med.* **2016**, 50, 1315–1324.]
- Mistry, S. K., & Puthussery, S. (2015). Risk factors of overweight and obesity in childhood and adolescence in South Asian countries: A systematic review of the evidence. *Public Health*, 129(3), 200–209. <https://doi.org/10.1016/j.puhe.2014.12.004>
- Mushtaq, M.U.; Gull, S.; Mushtaq, K.; Shahid, U.; Shad, M.A.; Akram, J. Dietary behaviors, physical activity and sedentary lifestyle associated with overweight and obesity, and their socio-demographic correlates, among Pakistani primary school children. *Int. J. Behav. Nutr. Phys. Act.* 2011, 8, 130
- Muthuri, S. K., Wachira, L.-J. M., Onywera, V. O., & Tremblay, M. S. (2014). Correlates of objectively measured overweight/obesity and physical activity in Kenyan school children: Results from ISCOLE-Kenya. *BMC Public Health*, 14, 436. <https://doi.org/10.1186/1471-2458-14-436>
- National Institutes of Health. (2014). *Bone Health and Osteoporosis: A Report of the Surgeon General*. U.S.

Department of Health and Human Services.

Nemec, Adamčák & Marko (2022):

Nemec, M., Adamčák, Š., & Marko, M. (2022). Development of perceptual and cognitive skills through sports and physical education in schools. *Physical Education and Sport Pedagogy*.

Nemec, M., Adamčák, Š., & Marko, M. (2022). The impact of organized sports on students' mental and physical health. *Journal of Physical Education and Sports Studies*, 18(3), 15–25.

Pate, R. R., O'Neill, J. R., & McIver, K. L. (2006). *Physical activity and health in children and adolescents*. Journal of School Health, 76(8), 345–357.

Pelusi, C.; Altieri, P.; Gambineri, A.; Repaci, A.; Cavazza, C.; Fanelli, F.; Morselli-Labate, A.M.; Pagotto, U.; Pasquali, R. Behavioral, socio-environmental, educational and demographic correlates of excess body weight in Italian adolescents and young adults. *Nutr. Metab. Cardiovasc. Dis.* 2019, 29, 279–289

Pi-Sunyer, F. X. (1993). *Medical hazards of obesity*. *Annals of Internal Medicine*, 119(7 Pt 2), 655–660.

R., Hussain, S., & Khan, S. H. (2020). Physical activity patterns among urban and rural adolescents in Pakistan: A comparative analysis. *Journal of Adolescent Health*, 66(2), 155–162. <https://doi.org/10.1016/j.jadohealth.2019.11.004>

Ranasinghe, C. D., Ranasinghe, P., Jayawardena, R., & Misra, A. (2013). Physical activity patterns among South-Asian adults: A systematic review. *International Journal of Behavioral Nutrition and Physical Activity*, 10(1), 116.

Resaland, G. K., Aadland, E., Aadland, K. N., Skrede, T., Anderssen, S. A., Andersen, L. B., ... & Moe, V. F. (2016). Effects of physical activity on school performance in children: The Active Smarter Kids (ASK) cluster-randomized controlled trial. *Preventive Medicine*, 91, 322–328.

Roman-Viñas, B.; Chaput, J.-P.; Katzmarzyk, P.T.; Fogelholm, M.; Lambert, E.V.; Maher, C.; Maia, J.; Olds, T.; Onywera, V.; Sarmiento, O.L.; et al. Proportion of children meeting recommendations for 24-hour movement guidelines and associations with adiposity in a 12-country study. *Int. J. Behav. Nutr. Phys. Act.* 2016, 13, 123.]

Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1988). *Social learning theory and the Health Belief Model*. Health Education Quarterly, 15(2), 175–183.

Roy, N.; Tanveer, M.; Liu, Y.-H. Stress and coping strategies for international students in China during COVID-19 pandemic. *Int. Res. J. Educ. Innov.* 2022, 3, 1–12

Sallis, J. F., Prochaska, J. J., & Taylor, W. C. (2000). *Correlates of physical activity in a national sample of adolescents*. The Journal of School Health, 70(3), 133–140

Sherwood, N. E., & Jeffery, R. W. (2000). *The behavioral determinants of exercise: Implications for physical activity interventions*. *Annual Review of Nutrition*, 20, 21–44.

Siddiqui, M. A. (2020). The effect of urbanization on adolescent physical activity patterns in Lahore, Pakistan: A qualitative study. *Asian Journal of Social Science Studies*, 5(2), 10–18. <https://doi.org/10.11648/j.ajsss.2020.05.02.12>

Singh, A., Uijtdewilligen, L., Twisk, J. W., van Mechelen, W., & Chinapaw, M. J. (2012). Physical activity and performance at school: A systematic review of the literature including a methodological quality assessment. *Archives of Pediatrics & Adolescent Medicine*, 166(1), 49–55. <https://doi.org/10.1001/archpediatrics.2011.716>

Sjöström, M., Castillo, M. J., Ruiz, J. R., & Ortega, F. B. (2008). Physical activity and muscle strengthening in adolescents. *European Journal of Applied Physiology*, 102(2), 103–111.

Smith, A. L., Jones, B. R., & Taylor, C. D. (2019). *Physical activity and adolescent health: A global perspective*. Routledge.

Smith, A. L., Ullrich-French, S., Walker, S. E., & Hurley, J. R. (2006). *The role of physical activity in social development during adolescence*. The Journal of Adolescent Health, 39(3), 397–399.

Staiano, A.E.; Katzmarzyk, P.T. Physical Activity, Screen Time, and Adiposity in Youth: Considering Youth at Risk of Becoming Obese. *Exerc. Sport Sci. Rev.* 2019, 47, 118–124. [Google Scholar]

- Stalsberg, R., & Pedersen, A. V. (2010). Effects of socioeconomic status on the physical activity in adolescents: A systematic review of the evidence. *Scandinavian Journal of Medicine & Science in Sports*, 20(3), 368–383. <https://doi.org/10.1111/j.1600-0838.2009.01047.x>
- Tanveer, M.; Asghar, E.; Tanveer, U.; Roy, N.; Zeba, A.; Al-Mhanna, S.B.; Batrakoulis, A. Community-Level Physical Activity Opportunities, Safe and Supportive Environment Factors, and Their Association with Overweight and Obesity among School-Aged Children and Adolescents in Pakistan- A Cross-Sectional Study. *Kurd. Stud.* 2024, 12, 6425–6432.
- Tanveer, M.; Roy, N.; Zeba, A.; Haider, S.; Albarha, N.S.; Tanveer, N.; Ali, M.; Tanveer, U. Prevalence of Body Mass Index and Associated with Demographic Factors among Pakistan School-Aged Adolescents. *Pak. J. Med. Health Sci.* 2022, 16, 212–215. [[Google Scholar](#)] [[CrossRef](#)]
- Tanveer, M.; Tanveer, U.; Tanveer, N.; Roy, N.; Zeba, A.; Razzaq, F.A. Parental health attitudes and knowledge factors associated with body mass index among Pakistani school-aged adolescents. *Pak. J. Med. Health Sci.* 2022, 16, 479–482.
- Thakur, J. S., Ghosh, S., Bhardwaj, S., Lyngdoh, T., & Amarchand, R. (2017). Urbanization, lifestyle changes, and the risk of non-communicable diseases in rural and urban India and Nepal: A cross-sectional study. *BMC Public Health*, 17(1), 977. <https://doi.org/10.1186/s12889-017-4988-2>
- Trost, S. G., Pate, R. R., & Sallis, J. F. (2002). Gender differences in physical activity among youth. *Public Health Reports*, 117(4), 353-359.
- Trost, S. G., Pate, R. R., Sallis, J. F., Fredson, M., Taylor, W. C., Dowda, M., & Sirard, J. R. (2002). *Gender differences in physical activity and determinants of physical activity in elementary school children*. The Journal of School Health, 72(6), 255-260.
- Van Sluijs, E. M., et al. (2011). Longitudinal studies on physical activity in youth. *Sports Medicine*, 41(4), 289-299.
- Vučić, L., & Kirin, S. (2020). The importance of physical education for students' overall development. *International Journal of Physical Education and Health*, 12(1), 45–53.
- Vučić, L., & Kirin, S. (2020). The role of physical activity in educational outcomes. *Journal of Physical Education and Sport*, 20(4), 2357–2365.
- World Health Organization. (2010). *Global recommendations on physical activity for health*. Geneva: World Health Organization.
- World Health Organization. (2016). Physical activity in adolescents: Fact sheet. WHO Regional Office for Europe.
- World Health Organization. (2018). Global action plan on physical activity 2018–2030: More active people for a healthier world. Geneva: World Health Organization. Available at: <https://www.who.int/publications/i/item/9789241514187>
- World Health Organization. (2020). *WHO guidelines on physical activity and sedentary behaviour*. World Health Organization. <https://www.who.int/publications/i/item/9789240015128>
- Worthington, A. K. (2021). Theory of planned behavior. Pressbooks. <https://ua.pressbooks.pub/persuasiontheoryinaction/chapter/theory-of-planned-behavior/>