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Unraveling Lifestyle Disease Vulnerabilities among Adolescents: A Comprehensive Comparative Analysis of Private and Government School Students in Rawalpindi and Islamabad

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Abstract

Purpose: The increasing prevalence of lifestyle diseases in adults necessitates a closer examination of risk factors that manifest during adolescence. This study addresses this imperative, aiming to comprehensively compare lifestyle disease risk factors among adolescents attending private and government schools, with a specific focus on the distinctive nuances present within diverse educational environments. The primary objective of this cross-sectional study is to provide a thorough exploration of lifestyle disease risk factors, thereby contributing to a more nuanced understanding of the complexities inherent in adolescent health within different school settings. The study's aim is to not only identify prevalent risk factors but also to highlight the variations that exist between students in private and government schools.

Methodology: The study engaged 600 adolescents from secondary schools in Rawalpindi and Islamabad, with 300 participants from each sector, employing purposive sampling for selection. Beyond the standard measurements of Body Mass Index (BMI), height, and weight, a comprehensive assessment encompassed dietary habits, physical activity levels, screen time, family history of lifestyle diseases, and active/passive smoking.

Findings: Noteworthy findings include a substantial 81% of overweight individuals affiliated with private schools, indicating a distinct prevalence in this demographic. Dietary disparities were evident, with private schools displaying a 60% daily consumption of fruits and vegetables, in contrast to 40% in government schools. Further distinctions were observed in daily dairy intake (54% in private schools vs. 46% in government schools) and weekly meat consumption (56% in private schools vs. 44% in government schools). Private schools exhibited higher rates of daily and weekly fast food (54%) and soft drink consumption (67%) compared to government schools (46% and 33%, respectively).

Physical activity engagement was reported by 45% of private school students and 55% of government school students, while screen time exceeding 2 hours was reported by 55% of private school students and 45% of government school students. Family history of lifestyle diseases was more significant among government school students. Additionally, 8% of private school students and 7% of government school students reported smoking, with 20% of private school students and 24% of government school students indicating a history of passive smoking.

Unique Contribution to Theory, Practice, and Policy: The study enriches theoretical understanding by offering a nuanced exploration of lifestyle disease risks and disparities among adolescents. In practical terms, the findings provide insights for designing targeted interventions tailored to the specific needs of private and government school students, informing health promotion programs and strategies. Policy relevance is emphasized through recommendations for school-specific health policies, considering socioeconomic factors, and advocating for long-term monitoring to facilitate effective public health planning. The identification of nuanced lifestyle disease risks within distinct school environments adds a critical dimension to our understanding of adolescent health and informs future policies and interventions.

Keywords: *Lifestyle disease, Risk factors, Adolescents, School environment, Intervention strategies, Health policy, Public health, Comparative analysis.*

Introduction:

The escalating global prevalence of lifestyle diseases as a burgeoning epidemic necessitates a meticulous examination of their origins, with a particular emphasis on adolescence—a pivotal stage marked by the pervasive impact of globalization and the continuous evolution of lifestyle patterns (1). Adolescents, navigating an environment characterized by constant lifestyle modifications, find themselves uniquely susceptible to developing a myriad of risk factors associated with these diseases.

To establish a conceptual link, it is imperative to define the intricate landscape of lifestyle diseases and the vulnerabilities faced by adolescents. Lifestyle diseases, encompassing a spectrum of health conditions influenced by modifiable behaviors, including overweight conditions, poor dietary choices, insufficient physical activity, prolonged screen exposure, and both active and passive smoking, collectively shape the health landscape of this demographic (2).

Adolescents, in this context, stand at the crossroads of these risk factors, their susceptibility accentuated by the multifaceted influence of global, regional, and local dynamics that shape their lifestyles. On a global scale, adolescents share a common vulnerability influenced by overarching global trends. However, regional and local variations introduce nuances that contribute to the complexity of lifestyle disease vulnerabilities in different communities (3).

Relevant studies underscore the urgency of understanding and addressing these vulnerabilities. Existing research not only highlights the impact of modifiable behaviors on the development of lifestyle diseases but also emphasizes the need for targeted interventions to curb their prevalence and impact (4). Despite this body of work, research gaps persist, particularly in comprehending the unique interplay of lifestyle disease vulnerabilities among adolescents in diverse socio-cultural contexts.

This study, in response to these gaps, seeks to bridge them by rigorously assessing the prevalence and variations in lifestyle disease risk factors among adolescents in private and government schools. By elucidating the regional and local nuances, our research aims to contribute nuanced insights essential for the strategic implementation of interventions tailored to mitigate the escalating burden of lifestyle diseases among this vulnerable demographic (5).

Methodology:

Study Design: A quantitative descriptive cross-sectional study was conducted among 600 adolescents aged 12-18 years attending classes 8th to 12th in various secondary schools in the government and private sectors of Rawalpindi and Islamabad.

Sampling Technique: Purposive sampling was employed for participant selection. A sample of 600 students, maintaining an equal male-to-female ratio, was collected from different government and private schools in Rawalpindi and Islamabad.

Setting: A total of 8 schools were approached, of which 3 did not permit data collection. Therefore, consent was obtained from 5 schools—3 private schools and 2 government schools.

Data Collection Tool: Students were surveyed through a self-administered questionnaire after obtaining consent from their respective principals. The questionnaire covered dietary practices, physical activity, screen time, family history, active and passive smoking.

Anthropometry: Weight and height were measured, and Body Mass Index (BMI) was calculated. Weight was measured to the nearest 0.5 kg, with the subject standing motionless on the weighing scale with feet about 15 cm apart. Height was measured to the nearest 0.5 cm with the subject in an erect position against a vertical surface. BMI was classified into four groups: underweight (BMI < 18.5), normal (BMI = 18.5-24.9), overweight (BMI = 25.0-29.9), and obese (BMI > 30.0).(6)

Data Analysis Tool: SPSS Software was used for data analysis.

Consent: Verbal consent was obtained from the principals before surveying the students. Informed verbal consent was then obtained from the students, assuring them of the confidentiality of the information provided.

Inclusion/Exclusion Criteria: Students aged 12-18 years, comprising 300 private school students and 300 government school students with an equal male-to-female ratio, were included. Students below 12 and above 18 years were excluded from the study.

Results:

A total of 600 schoolchildren, consisting of 300 government and 300 private school students with an equal male-to-female ratio (1:1), were included in the study population (1).

BMI: The Body Mass Index (BMI) of the students was calculated using their height and weight. Based on these calculations, 1% of the students (n=13) were classified as obese (BMI ≥ 30 Kg/m²), 12% (n=71) as overweight (BMI 25-29.9 Kg/m²), and 44% (n=262) as underweight (BMI < 18.5 Kg/m²) (2).

A comparison was conducted between overweight and underweight students with respect to their socio-demographic profiles. Overweight and obesity were observed in private school students, whereas underweight was prevalent among government school students

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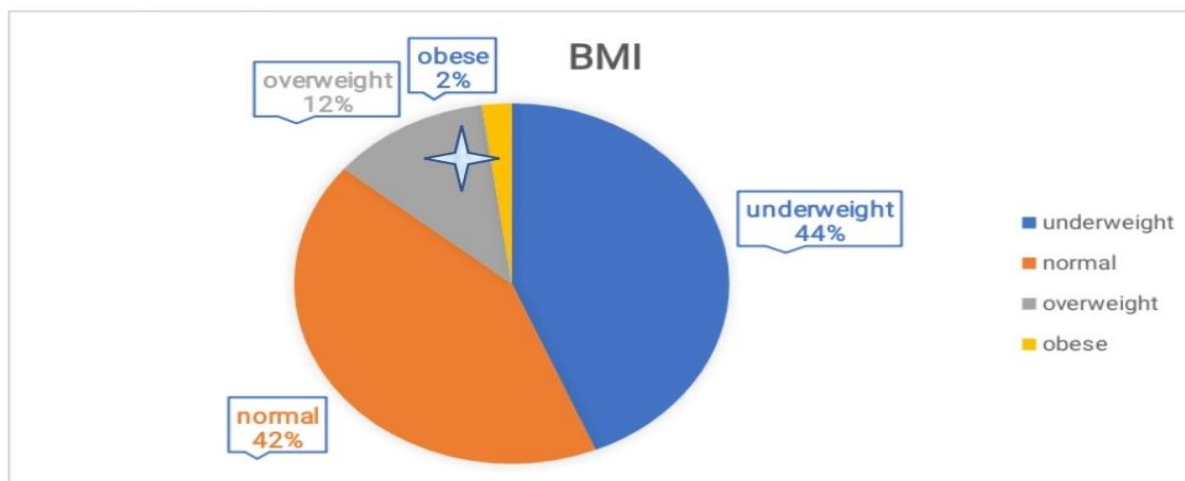
School Type * BMI Crosstabulation

		BMI				Total
		Underweight	Normal	overweight	Obese	
School Type	Private Schools	99	137	*58	6	300
	Govt Schools	*163	117	13	7	300
Total		262	254	71	13	600

Dietary Habits:

Dietary habits of schoolchildren were comprehensively assessed:

Fruits and Vegetables Consumption: 60% of students who had daily consumption of fruits and vegetables belonged to private schools, while it was 40% in government schools.

Dairy Consumption: Daily dairy consumption was reported by 54% of students in private schools and 46% in government schools.

Meat Consumption: Weekly consumption of meat was higher in private schools at 56%, compared to 44% in government schools.

Breakfast Consumption: Daily breakfast consumption was reported by 47% of private school students and 53% of government school students.

Fast Food Intake: Daily and weekly intake of fast food was higher in private schools at 54%, compared to 45.6% in government schools.

Soft Drink Consumption: Daily and weekly soft drink consumption was prevalent among 67% of private school students and 32.6% of government school students
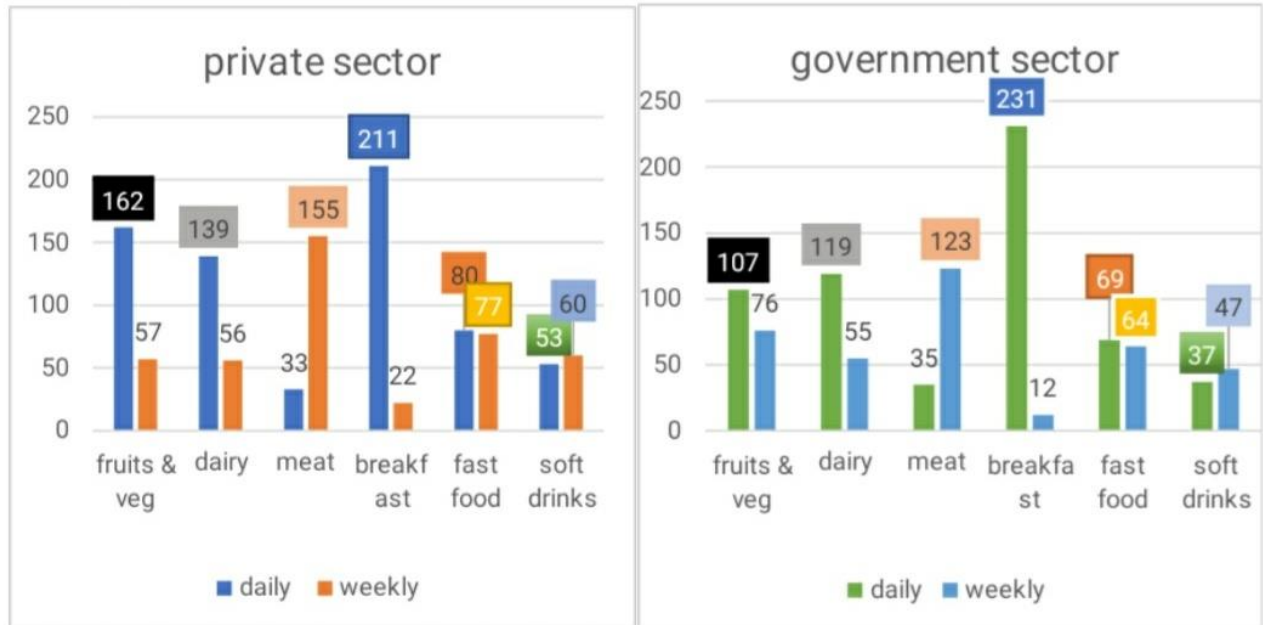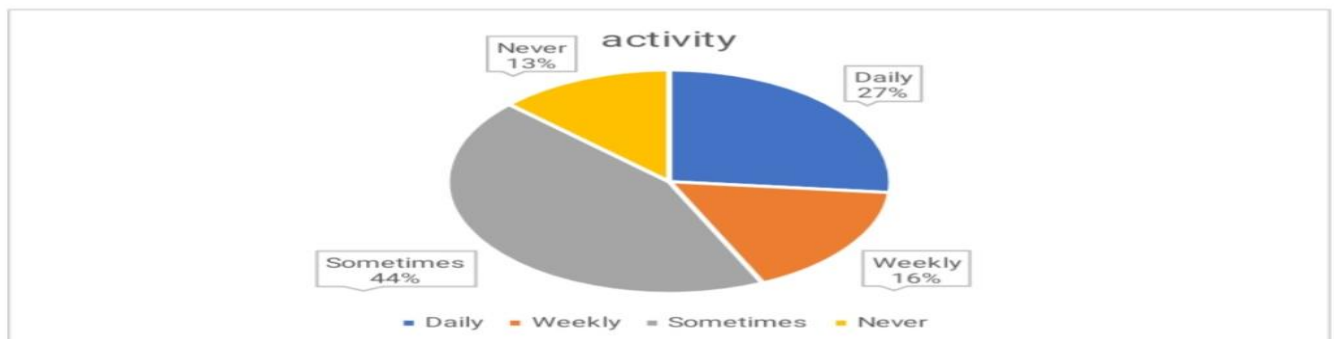

Dietary Habits of school children

Physical Activity:

In assessing physical activity among students:

Frequency of Physical Activity: 44% of students reported engaging in physical activities sometimes. 27% were involved in daily physical activities. 16% participated in physical activities on a weekly basis. 13% reported never engaging in physical activities.

School Type * Physical_Activity Crosstabulation

School-wise Comparison: Among students who performed daily physical activity, 55% were from government schools.

School Type * Physical_Activity Crosstabulation

		Physical_Activity				Total
		Daily	Weekly	Sometimes	Never	
School Type	Private Schools	72	55	146	27	300
	Govt Schools	87	44	118	*50	299
Total		159	99	264	77	599

Screen Time:

A cross-tabulation of school type and screen time revealed the following:

Watching TV/Playing Online Games: 57% of students who watched TV for less than 2 hours belonged to government schools. In contrast, 55% of students who watched TV for more than 2 hours belonged to private schools.

School Type – Screen time
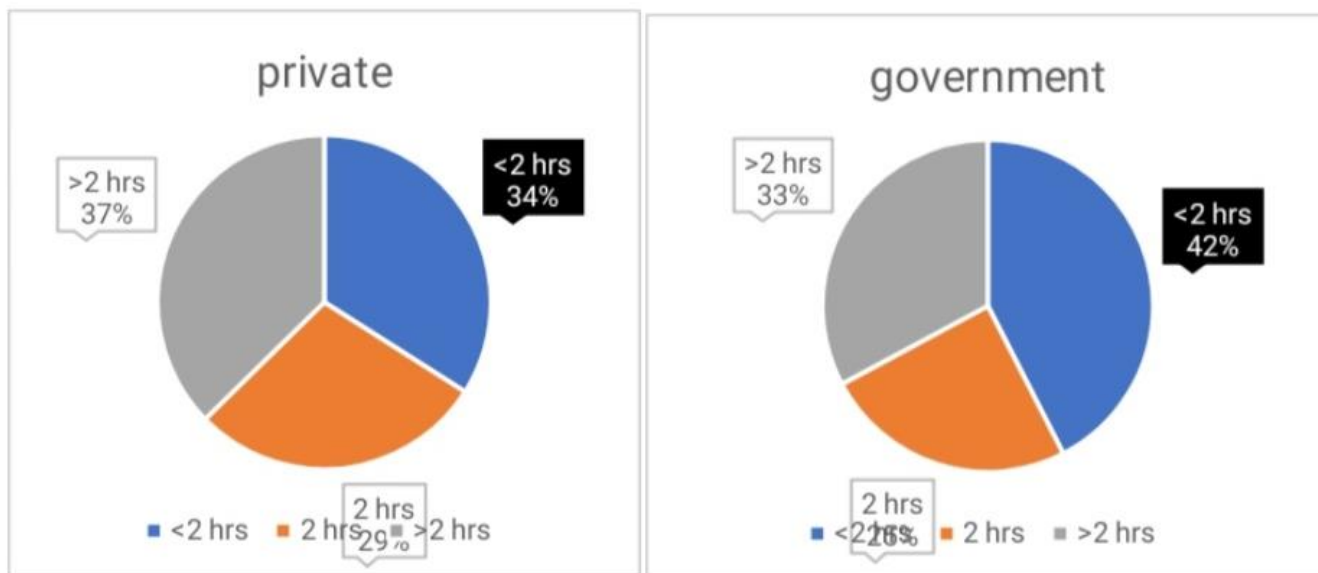
Family History of Health Conditions:

Cardiovascular Disease was reported 20% in private schools and 21% in government schools. Diabetes was 38% in private schools and 44% in government schools. Hypertension was reported 52% in private schools and 64% in government schools. Mental Illness was found 4% in private

schools and 9% in government schools. Cancer was reported 8% in private schools and 5% in government schools.
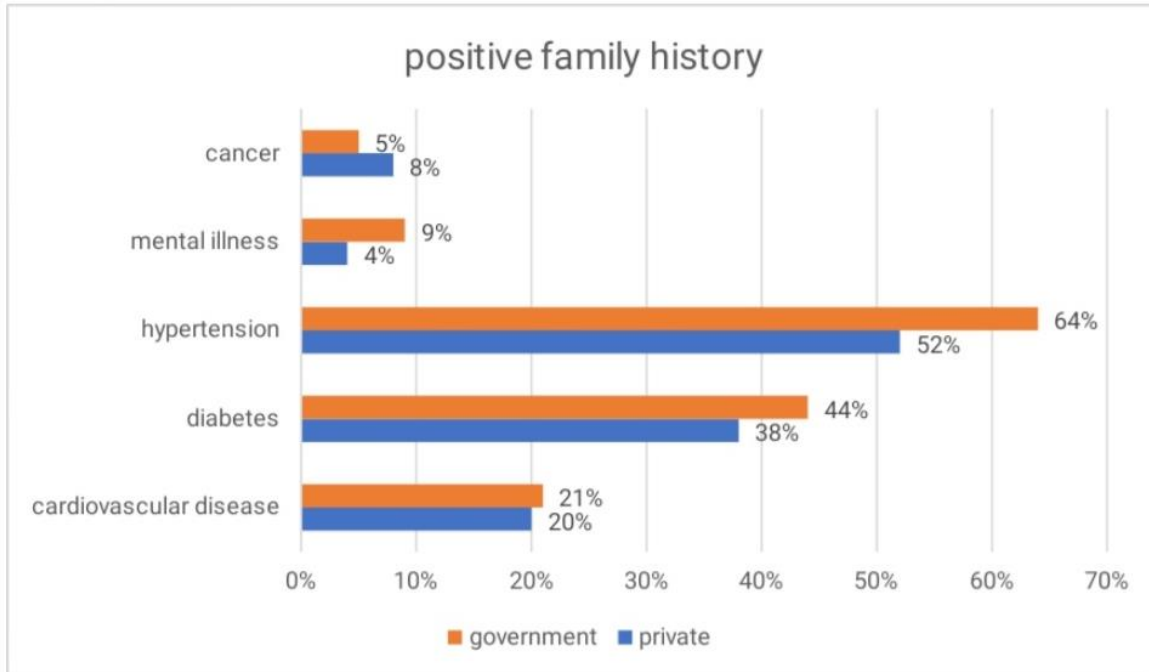
Family History of health conditions in school children

Smoking Habits:

Out of the 600 participants, with 300 each from the private and government sectors:

Individual Smoking: 8% (n=24) of respondents from the private sector reported smoking. 7% (n=20) from the government sector reported smoking.

Family Smoking History: 38% (n=115) from the private sector and 37% (n=112) from the government sector reported a family history of smoking.

Passive smoking * School Type Crosstabulation

Count

		School Type		Total
		Private Schools	Govt Schools	
Passive smoking	Yes	59	*72	131
	No	241	228	469
Total		300	300	600

Passive Smoking: 20% (n=59) from the private sector and 24% (n=72) from the government sector reported a history of being exposed to smoking in their family members' presence.

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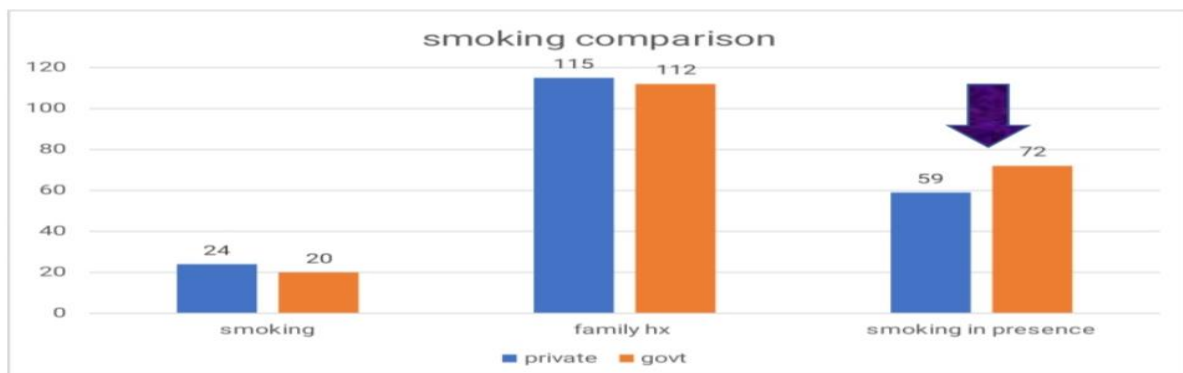
Smoking Habits – Students

Discussion:

The primary objective of this study was to discern the correlation between different risk factors of lifestyle diseases and the school sector in which children and adolescents were enrolled (private/government).

BMI and Weight Status: From the data analysis, it was observed that 81% of overweight students belonged to private schools, while 62.2% of underweight students belonged to government schools. This aligns with previous studies, and it's noteworthy that only 42% of the total study population had a normal BMI (13,7).

Dietary Habits: The study revealed that the consumption of fruits and vegetables is more frequent among private school students. However, mixed findings, particularly for dietary items considered 'healthy,' have been reported in other studies. Weekly meat intake was higher in private school students, aligning with a pattern of more frequent consumption of fast food and soft drinks due to modified lifestyle behavior and more available resources (8,9)).

Sedentary Lifestyle: The study delved into sedentary lifestyle patterns as a potential risk factor for lifestyle diseases, particularly in relation to physical activity. Notably, more than 55% of students engaged in daily physical activity hailed from government schools, signaling potentially lower sedentary behavior in this group. In contrast, over 55% of adolescents with screen time exceeding 2 hours were associated with private schools, indicating a higher prevalence of sedentary behavior in this sector. This aligns with existing literature emphasizing the impact of school environment and socioeconomic factors on physical activity and sedentary habits among adolescents (10,11,15).

Smoking Habits: Active smoking was found to be almost equally prevalent among adolescents in both private and government schools. However, the risk of passive smoking was notably higher among adolescents in government schools. This finding underscores the home environment as a key source of passive smoke, particularly for children from lower socioeconomic groups, aligning

with previous studies highlighting the influence of household dynamics on smoking exposure among adolescents (12).

Family History: With respect to family history, except for cancer, a higher prevalence of cardiovascular disease, diabetes, hypertension, and mental illness was observed among adolescents in government schools. This mirrors findings from previous studies linking socioeconomic factors to variations in the prevalence of familial predispositions to certain lifestyle diseases (16).

Overall Risk Factors Association: Upon surveying 600 adolescents, the majority of risk factors considered in the study demonstrated a more significant association with adolescents in private schools. These factors include above-normal BMI, increased physical inactivity, extended screen time, more frequent skipping of daily breakfast, and higher consumption of unhealthy items such as fast foods and soft drinks. Conversely, family history of lifestyle diseases and passive smoking exhibited a higher association with adolescents in government schools. These findings highlight the diverse health profiles within different school sectors, emphasizing the need for tailored interventions and echoing similar observations in the literature (14).

In conclusion, this study not only contributes valuable insights into the lifestyle disease risk factors among adolescents but also underscores the importance of considering the contextual nuances of school sectors for effective and targeted health interventions.

Conclusion:

The study suggests that the majority of risk factors for lifestyle diseases are prevalent among private school students. Various risk factors have been identified and highlighted, providing valuable insights to enhance the lifestyle of school-going adolescents. Implementing interventions based on these findings can contribute to lowering the risk of developing lifestyle diseases later in life.

Recommendations:

Tailored Interventions: Develop and implement targeted health interventions that specifically address the identified lifestyle disease risk factors in both private and government school settings.

Education Initiatives: Incorporate comprehensive nutrition education programs in school curricula to improve dietary habits, emphasizing the importance of balanced nutrition.

Physical Activity Promotion: Implement initiatives to promote physical activity within school premises, encouraging active lifestyles among students.

Screen Time Management: Establish guidelines and awareness programs to manage screen time effectively, especially in private schools where higher screen time prevalence was observed.

Tobacco Control: Initiate school-based tobacco control programs to address both active and passive smoking, focusing on preventive measures and awareness.
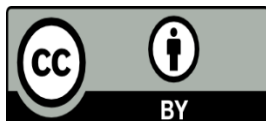
Policy Development: Advocate for the development of school-specific health policies, informed by the socioeconomic nuances identified in the study, to create a healthier school environment.

These recommendations aim to bridge the gap between theoretical understanding, practical intervention, and policy development, fostering a holistic approach to adolescent health in diverse school settings.

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