PJPT PAKISTAN JOURNAL OF PHYSICAL THERAPY
ISSN NO: 2663-0796 (Print) | ISSN NO: 2663-080X (Online)

ORIGINAL ARTICLE

SHAPING ADOLECENT HEALTH: A COMPREHENIVE ANALYSIS STUDY OF DIETARY HABITS, PHYSICAL ACTIVITY AND SCREEN TIME IN SCHOOL STUDENT FROM KARACHI, PAKISTAN

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ABSTRACT

In contemporary society, the health and well-being of school-going children have emerged as focal points of concern. With the prevalence of sedentary lifestyles and poor dietary habits, there is a growing need to comprehensively assess and address the health behaviors of students. **Objective:** This study aims to assess the dietary intake behavior of school-going children in elementary, middle, and high school levels, examining their nutritional choices and habits. Additionally, it seeks to evaluate their physical activity levels both within and outside the school context to determine compliance with recommended guidelines for physical fitness. Furthermore, the research aims to quantify screen time exposure among these students, providing crucial insights into their media consumption patterns. **Methods:** This cross-sectional study included 384 students of grade 3rd to 10th and the Youth profile activity questionnaire used to examine the lifestyle behaviors of school-going children. The questionnaire was strategically divided into three major sections for clarity and convenience. Part A focused on assessing their activity levels both inside and outside of school, while Part B delved into inquiries about sedentary behaviors during weekends. Lastly, Part C was designed to gather detailed information regarding their dietary intake patterns. **Results:** This study involved 384 Karachi students, with a balanced gender distribution. Notably, many students chose active commuting ($p = 0.05$), but pre-school physical activity was statistically insignificant ($p = 0.61$). However, activity levels increased significantly after school and on weekends ($p = 0.03$ and $p = 0.00$). Concerns also arose about extended screen time and suboptimal diets, with significant findings regarding technology use ($p = 0.03$) and breakfast ($p = 0.04$). This research sheds light on key health trends among students, emphasizing the need for healthier lifestyles. **Conclusion:** Despite the anticipation of different results, the significance of the findings suggests that the lifestyle of school-going students is suboptimal. To promote healthier lifestyles in schools, a comprehensive approach is crucial. Forming a school wellness committee involving teachers, parents, and students can effectively champion health initiatives, fostering a collective commitment to well-being.

Keywords: Diet, Physical Education, Physical activity, Screen time, Youth profile activity questionnaire.

INTRODUCTION

This study endeavors to delve into the dietary intake behavior, physical activity levels, and screen time exposure of school children across different educational levels. By examining these aspects, the research aims to provide insights into the current health trends among students and highlight areas

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Received: : November 30, 2023 | **Revised:** December 13, 2023 | **Accepted:** February 19, 2024

for intervention to promote healthier lifestyles. This study focuses on exploring the pivotal domain of adolescent health and lifestyle habits, with specific attention directed towards school-aged children ranging from 10 to 19 years old, in accordance with the parameters outlined by the World Health Organization (WHO)[1]. Adolescents, constituting a substantial portion of the global population estimated at 1.3 billion, approximately 16 percent of the world's inhabitants are a focal demographic of our study. Notably, in Pakistan, individuals aged 15 to 24 are poised to reach a noteworthy figure of 44.6 million by 2020, encompassing nearly a quarter of the nation's total population[2].

The concept of adolescence as a distinct developmental phase is relatively novel in Pakistan, as evidenced by data from the Pakistan Population Association, which indicates that approximately 65 percent of households in the country include individuals in the adolescent stage of life [3]. Adolescence, marked by profound physical, sexual, psychological, and social transformations, presents both opportunities for growth and development and potential health-related challenges. The significance of physical activity in promoting a wholesome lifestyle, particularly during adolescence, cannot be understated [4].

However, recent decades have witnessed a concerning decline in physical activity among children, with contemporary youngsters expending significantly fewer calories per day compared to their counterparts from half a century ago [5]. This prevailing sedentary trend is a significant contributing factor to the escalating incidence of non-communicable diseases which encompass a wide spectrum of health conditions such as cardiovascular diseases, diabetes, obesity, and certain types of cancer. These NCDs are anticipated to account for a substantial share of mortality in developing nations by 2020 [6].

The reduced levels of physical activity in modern children, leading to a decline in calorie expenditure, have been identified as a key element exacerbating this health crisis. Addressing this sedentary trend is paramount in mitigating the impending public health challenges associated with NCDs among the youth population[7]. Obesity is also becoming increasingly prevalent in Pakistan, mirroring trends observed in other developing countries, and childhood obesity, in particular, exacts a substantial toll on overall well-being, potentially leading to chronic diseases as children advance in age [8,9].

Suboptimal dietary habits, characterized by the consumption of high-sugar and high-fat foods, further compound the risk factors for chronic diseases[10]. Pakistan grapples with a multifaceted nutritional challenge, characterized by the simultaneous prevalence of over-nutrition, parti-cularly in the form of obesity, and under-nutrition. The surge in obesity rates is intricately linked to contemporary lifestyles characterized by reduced physical activity and the consumption of unhealthy diets. Sedentary routines, often associated with urban living and modern work environments, contribute to a decline in physical activity levels, while the widespread availability and consumption of processed foods high in sugars and unhealthy fats further exacerbate the issue[11]. Conversely, under-nutrition persists due to a combination of socio-economic factors, including poverty, limited access to nutritious foods, and inadequacies in healthcare infrastructure. Economic disparities and resource constraints hinder certain segments of the popu-lation from maintaining a well-balanced and nouri-shing diet.

This coexistence of nutritional challenges underscores the importance of addressing not only the quantity but also the quality of diets. A comprehensive approach should encompass initiatives to promote healthier dietary patterns, raise awareness about nutrition, enhance access to nutritious foods, and tackle socio-economic barriers contributing to nutritional disparities[12].

Insufficient access to nutritious food impacts child survival, growth, education, and overall well-being[13]. In fact, malnutrition plays a substantial role in child mortality, either directly or indirectly accounting for over 60% of the approximately 10 million child deaths that occur annually [14]. Within the developing world, 43% of children experience stunted growth, and 9% suffer from wasting, underscoring the pervasive and far-reaching impact

of this issue on child health and well-being [15].

In response to these pressing concerns, this cross-sectional study seeks to comprehensively investigate the dietary behaviors, physical activity levels, and screen time habits among school-going children in Karachi, Pakistan. To achieve this objective, the research employs the Global School-Based Student Health Survey for data collection pertaining to dietary behaviors and screen time habits, while the Youth Profile Activity questionnaire assesses the students' physical activity patterns [16].

This study is poised to provide valuable insights into the health and lifestyle of school children, offering a data-driven foundation for targeted interventions and policies aimed at improving their overall well-being. The driving motivation behind this study is to shed light on the way of life and behaviors among growing-age children, specifically those in the adolescent phase and school-going children. The ultimate goal is to observe and comprehend their lifestyle choices, recognizing that the majority of diseases that manifest later in life have their roots deeply embedded in childhood patterns of life. This research will significantly contribute to our understanding of the lifestyle functioning of children in Karachi, Sindh, Pakistan, offering valuable insights to address health challenges in this population.

MATERIALS AND METHODS

This research adopted a cross-sectional study design, conducted in selected schools in Karachi both private and public chosen conveniently for research purposes. The study involved the admin-istration of questionnaires in organized classrooms, tailored to the grade levels of participating students. Executed over a six-month span, from September to February, this deliberate timeframe aimed to ensure a comprehensive data gathering process aligned with specific research objectives and method-ological requisites. The participants were exclu-sively students in grades 3rd to 10th, intentionally targeted across this spectrum and encompassing only those present in their classrooms on the survey day. The determined sample size of 384 participants was based on rigorous statistical considerations, calculated using Cochran's sample size formula. The study's sample selection criteria included specific inclusion and exclusion criteria, with eligibility extending to students enrolled in grades 3rd to 10th who were present on the day of data collection. Exclusion criteria involved students below 3rd grade and those absent on the collection day. Utilizing the Youth profile activity questionnaire, segmented into three sections, the research assessed activity levels within and outside the school setting, sedentary behaviors during weekends, and dietary intake.

Data collection relied on the voluntary participation of students who had consented to be part of the study. Prior to each questionnaire section, participants provided demographic information and received comprehensive instructions. Ethical approval was obtained from the Institutional Review Board (IRB) of the College of Physiotherapy, Jinnah Postgraduate Medical Center. Informed consent was acquired from all participants before their inclusion in the study, and measures were taken to ensure confidentiality and anonymity of data.

Statistical Analysis

It was carried out using the Statistical Package for the Social Sciences (SPSS), facilitating meaningful insights extraction and the formulation of statistically significant conclusions. Qualitative variables were measured in terms of frequency and percentages. post treatment effects. Data was presented in form of tables and charts.

RESULTS

The study included 384 students from diverse schools in Karachi, with a gender distribution of approximately 51.0% males (n=196) and 48.7% females (n=187). Among the participants, the majority 54%, (n=207) were enrolled in middle school, while 23% (n=89) attended elementary school, and 22.7% (n=87) were from higher school.

Regarding participation in sports or physical activity, the minimal percentage of 1.0% (n=4) participated in two sessions, and 5.7% (n=22) engaged in three sessions. Additionally, a small fraction of 1.0% (n=8) attended four sessions, and 2.1% (n=8) of the students participated in five or more sessions as shown in Table 1.

Table 1. The prevalence of physical activity sessions attended by students

Values	Frequency	Percent
0	109	28.4
1	236	61.5
2	4	1.0
3	22	5.7
4	4	1.0
5 or more	8	2.1

The findings indicate a notable lack of emphasis on physical education (PE) among the student population. A substantial portion, comprising 65.1% (n=250) of the respondents, reported not having PE at all. Furthermore, a mere 1.6% (n=6) stated that they had PE almost none of the time, while 15.9% (n=61) reported experiencing it only to a limited extent. In contrast, a relatively small proportion of students, approximately 4.9% (n=19) each, indicated having a moderate or significant exposure to PE. These results underscore the need for increased awareness and incorporation of PE in the students 'educational experiences. On weekend nights, the study revealed a relatively higher level of activity among students compared to weekdays. Notably, 24.0% (n=92) of students engaged in a large amount of activity on Saturday nights, while 19.3% (n=74) reported a moderate to large amount of activity. Similarly, on Sundays, 24.2% (n=93) of students participated in a large amount of activity, and 16.4% (n=63) engaged in a moderate to large amount of activity. These findings suggest that students exhibited a slightly more active lifestyle during weekends in contrast to the working days as shown in Figure 1.

Furthermore, the study findings also illuminated concerning trends in sedentary habits among the students, particularly in the realm of mobile phone and computer usage, with highly significant results ($p = 0.34$, $p = 0.00$) pointing to prolonged screen time.

Subsequent to evaluating physical activity levels, this study delved into students' screen time habits. The findings revealed distinct patterns of smartphone usage among the students. Specifically, approximately 27.6% of the students engaged with their devices for more than two hours daily as shown in Figure 2.

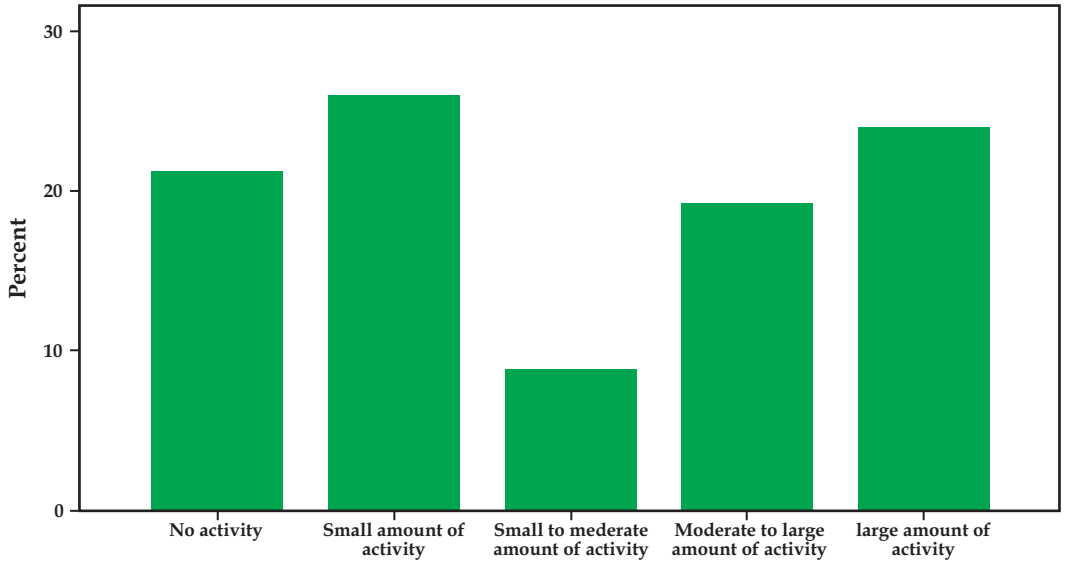

Figure 1. The level of activity among students on weekend nights

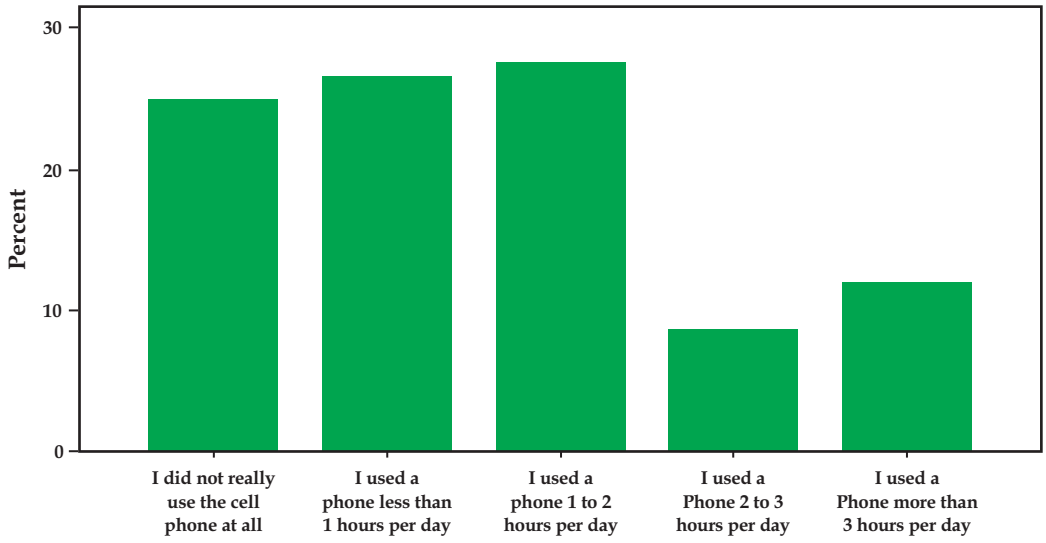

Figure 2. The time spent by students on using smart phone

The dietary intake behaviors of the students were another focal point of the study. Results indicated a less-than-desirable dietary pattern, with significance observed in categories such as milk consumption ($p = 0.03$) and breakfast habits ($p = 0.04$)

The prevalence of milk consumption among students revealed diverse patterns. Notably, 29.4% (n=113) reported not drinking milk at all, indicating a substantial proportion of students refraining from milk consumption. Conversely, 25.8% (n=99) consumed milk 4 to 6 times a week, highlighting a consistent milk intake pattern among a considerable portion of the cohort. Additionally, 24.0% (n=92) reported drinking milk once a week, while 10.7% (n=41) indicated a frequency of 2 times a week. A smaller group of students, 9.6% (n=37), reported consuming milk 1 to 3 times a week as shown in Table 2.

The results of this study revealed important insights into students' lifestyles. They showed that students have complex relationships with physical activity, screen time, and diet. These findings highlight the importance of programs and education to encourage healthier choices among students.

Table 2. The prevalence of drinking milk

Values	Frequency	Percent %
I did not drink milk	113	29
1 to 3 times	37	9
3 to 4 times	99	25
1 time	92	24
2 times	41	10
6	1	0.3
Total	383	99

DISCUSSION

The present observational study delved into the lifestyles of school-going students, providing valuable insights into their behaviors and habits. The results carry significant implications for shaping the lives of students, especially within the school context, emphasizing the pivotal role of schools in fostering holistic well-being and the incl-

usion of physical education in the academic curriculum.

In terms of the study population, there was a slight predominance of male students (51.2%) over their female counterparts (48.8%). Notably, a substantial portion of participants (27.6%, n=106) reported using smartphones for more than 2 hours daily, while 25.6% (n=96) refrained from mobile phone usage altogether. These trends align with a study by Wada, which found similar results in 295 students, with 98.6% owning mobile phones and 58.6% using them for over 2 hours daily, with 10.5% exceeding 5 hours of usage [17].

Regarding sedentary behavior during leisure time, 35.9% (n=138) of participants favored not remaining idle, while 14.3% (n=55) embraced a more sedentary lifestyle. These findings resonate with a study by Pires *et al.* (2018) where a significant portion of the sample (boys=62.2%; girls=69.9%) spent more than two hours per day engaged in screen-related activities, including television, computer usage, or video games [18].

Another study of Geest *et al.* (2017) explored the activity levels among children and revealed that the majority were highly physically active (82.8%). However, 56.2% exhibited low Screen-Specific Time (SST) levels, indicating less than 14 hours per week outside of school. The mean SST duration for boys was 95 minutes per day, while for girls; it was 123 minutes per day, surpassing the mean value of 109 minutes per day [19].

When comparing the results of this study to previous research, it is essential to highlight that 81% (n=31) of participants reported using a computer for more than 2 hours, while a substantial proportion (58%, n=223) did not use computers at all. This disparity underscores the variability in screen time behaviors across different populations. For instance, a study by Lyngdoh *et al.* (2019) conducted among school students in Manipur, found that 56%, 50.4%, 32.9%, and 92.5% of participants owned a smartphone, laptop, computer, video game, and television, respectively [1].

Implementing restrictions on screen time and promoting healthy habits among school-going students may face certain challenges or barriers from parents. One potential challenge is resistance or pushback from children who are accustomed to extended screen time for entertainment or academic purposes. Parents may encounter resistance, complaints, or negotiation attempts from their children when trying to establish limits. To address this, it is essential for parents to communicate openly with their children about the reasons behind these restrictions, emphasizing the importance of a balanced lifestyle that includes physical activity, proper nutrition, and adequate sleep.

Another challenge may be the influence of peer pressure or societal norms, where children may perceive screen-related activities as integral to social interactions or staying updated. Parents can overcome this by fostering alternative social activities that involve face-to-face interactions, outdoor play, or group activities. Encouraging a sense of balance and demonstrating that a healthy lifestyle can be enjoyable are key in overcoming resistance from children.

Furthermore, the study assessed the dietary habits of students, revealing notable patterns. A majority (29.4%) did not regularly consume milk, with only 10.7% incorporating it into their daily routine. In contrast, 30.5% indulged in salty foods 3-4 times a day, and 60% consistently had breakfast. These findings contrast with those of a study Moore *et al.* (1995) where only 5.8% of students adhered to a healthy diet. These insights collectively emphasize the multifaceted nature of student lifestyles, highlighting areas where targeted interventions and educational programs are warranted [20].

CONCLUSION

It is concluded that the overall lifestyle of school-going students can be characterized as suboptimal and ineffective in terms of physical well-being. Given the positive impact observed from the incorporation of physical education classes in school curricula and the active involvement of parents in fostering healthy habits, it wholeh-eartedly recommends the adoption of these proa-ctive measures. The advocate for schools to embrace

physical education as an integral part of the educational experience, fostering holistic well-being. Simultaneously, it encouraged parents to take a leading role in instilling healthy dietary practices and imposing reasonable limits on screen time for their children. By doing so, it is believed these conscientious measures will significantly contribute to the overall enhancement of the lifestyle and well-being of students throughout their academic journey.

DECLARATION

Conflict of interest: The author declared no conflict of interest.
Funding support: No funding source was involved.

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