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ORIGINAL PAPER

SPORTS PARTICIPATION AND PHYSICAL ACTIVITY AS DETERMINANTS OF HEALTHY HABITS IN ALBANIAN ADOLESCENTS: A CROSS-SECTIONAL STUDY

Vjollca SHPATA[1,2]✉, Xhensila FRASHËRI-PRENDUSHI[3], Klejda TANI[1], Alma NURÇE[3], Albana SHAHINI[3], Alma SOXHUKU-ISUFI[2,4]

[1] Faculty of Rehabilitation Sciences, Sports University of Tirana, Albania
[2] Faculty of Medicine, University of Medicine, Tirana, Albania
[3] Faculty of Medical Technical Sciences, University of Medicine, Tirana, Albania
[4] University Hospital of Obstetrics and Gynaecology "Mbretëresha Geraldinë", Tirana, Albania

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Abstract

Introduction. Regular physical activity during adolescence supports physical fitness, healthy weight management, cognitive development, and psychological well-being. Examining its relationship with sport participation, nutrition, sleep, and sedentary screen time can provide a broader understanding of adolescent lifestyle behaviours.
The objective of the study was to evaluate sports activity and its relationship with dietary habits, screen time, and sleep patterns among students aged 10–15 years in Tirana, Albania.
Material and methods. A cross-sectional survey was carried out in nine public secondary schools, from January to May 2024. A total of 2,020 students completed a self-reported questionnaire on sports participation, physical activity, dietary habits, screen time, and sleep duration. Anthropometric measurements were taken. Logistic regression was used to analyze associations between sports participation and lifestyle behaviours.

Résumé

La participation sportive et l'activité physique comme déterminants des habitudes de vie saines chez les adolescents Albanais: une étude transversale

Introduction. La pratique régulière d'une activité physique à l'adolescence favorise la condition physique, le maintien d'un poids sain, le développement cognitif et le bien-être psychologique. L'étude de ses relations avec la pratique sportive, l'alimentation, le sommeil et le temps sédentaire devant les écrans permet de mieux comprendre les habitudes de vie des adolescents.
L'objectif de cette étude a été d'évaluer la pratique sportive et son association avec les habitudes alimentaires, le temps passé devant les écrans et les habitudes de sommeil chez des élèves âgés de 10 à 15 ans à Tirana, en Albanie.
Matériel et méthodes. Une enquête transversale a été menée dans neuf écoles publiques du cycle secondaire entre janvier et mai 2024. Au total, 2 020 élèves ont rempli un questionnaire auto-administré portant sur la participation sportive, l'activité physique, les

✉ Address for correspondence: Vjollca SHPATA
Faculty of Rehabilitation Sciences, Sports University of Tirana, Albania
Address: Muhamet Gjollesha street, Tirana, Albania
E-mail: vjollca.hajro@yahoo.com; Phone 00355692635004

Results. Of the participants, 66.5% engaged in sports, with boys being more likely to participate than girls (OR = 2.59, 95% CI: 2.14–3.14). Sports participants spent significantly more time in physical activity (8.23±3.99 versus 3.49±2.22 hours/week, p < 0.0001) and less time in front of screens (2.63±1.56 versus 2.87±1.78 hours/day, p = 0.001) than non-sporting participants. No significant difference was observed in sleep duration. Sports participation was associated with higher odds of consuming ≥ 3 portions of fruits and vegetables daily (OR = 1.64, 95% CI: 1.24–2.17) and lower odds of eating takeaway food and consuming food while using screens. Only 10.9% of all students met World Health Organization physical activity recommendations, with lower rates among overweight and obese youth.

Conclusions. This study demonstrates that sports participation among Albanian adolescents is associated with healthier eating habits and reduced sedentary behaviour. Promoting sports involvement can help establish healthier lifestyle habits in young people, supporting obesity prevention and improving public health outcomes.

Keywords: adolescent health, sports participation, lifestyle behaviours, screen time, physical activity.

List of abbreviations:
AW – average weight
BMI – body mass index
CI – Confidence Interval
HBSC – Health Behaviour in School-aged Children
HRQOL – health-related quality of life
OB – obese
OR – odds ratio
OW – overweight
SOB – severely obese
TV – television
WHO – World Health Organization

Résultats. Parmi les participants, 66,5% pratiquaient un sport, les garçons étant plus susceptibles de participer que les filles (OR = 2,59; IC à 95%: 2,14–3,14). Les participants sportifs consacraient significativement plus de temps à l'activité physique (8,23±3,99 contre 3,49± 2,22 heures/semaine; p < 0,0001) et moins de temps devant les écrans (2,63±1,56 contre 2,87±1,78 heures/jour; p =0,001) que les non-participants. Aucune différence significative n'a été observée concernant la durée du sommeil. La pratique sportive était associée à une probabilité plus élevée de consommer au moins trois portions de fruits et légumes par jour (OR = 1,64; IC à 95%: 1,24–2,17) et à une probabilité plus faible de consommer des plats à emporter ainsi que de manger tout en utilisant des écrans. Seuls 10,9% de l'ensemble des élèves atteignaient les recommandations de l'Organisation mondiale de la Santé en matière d'activité physique, avec des taux plus faibles chez les jeunes en surpoids ou obèses.

Conclusions. Cette étude montre que la participation sportive chez les adolescents albanais est associée à des habitudes alimentaires plus saines et à une réduction des comportements sédentaires. La promotion de la pratique sportive peut contribuer à l'adoption d'habitudes de vie plus saines chez les jeunes, favorisant ainsi la prévention de l'obésité et l'amélioration de la santé publique.

Mots-clés: santé des adolescents, participation sportive, comportements liés au mode de vie, temps d'écran, activité physique.

Introduction

Physical activity in adolescence enhances fitness, bone and heart health, weight management, cognitive development, and social skills, with benefits often lasting into adulthood[1]. The benefits of being physically active are evidence-based, and their impact on health, by preventing overweight, obesity, and chronic degenerative diseases, is recognised[2-4].

Being physically active influences sleeping patterns[5], lifestyles[2], and how children and adolescents spend their leisure time[6,7], by promoting socialization, healthy leisure activities, and overall well-being[2]. Physical activity, alongside proper nutrition and quality sleep, greatly benefits the mental health and well-being of young people, making it a vital factor in maintaining psychological and physical balance during adolescence[2]. The review by Wu and colleagues found that children and adolescents who engaged in higher levels of physical activity reported improved health-related quality of life (HRQOL)[8], demonstrating a dose-response relationship between physical activity and HRQOL in both boys and girls[2,8].

Guidelines recommend that children and adolescents engage in at least 60 minutes of physical activity each day[9]. However, most young people in many countries fail to reach the recommended levels of physical activity[8]. Eighty-one per cent of adolescents worldwide are not sufficiently physically active, with a higher rate of inactivity among teenage girls,

at 85%. A trend of increasing physical inactivity with age during adolescence is also observed[10].

Physical inactivity is considered a global pandemic and a significant obesogenic factor among children and adolescents. Evidence shows that prolonged sedentary behaviour is linked to lower quality of life in physical, mental and psychosocial health domains among children and adolescents, regardless of their physical activity levels, gender, age, or body weight[8].

The increasing use of screen-based devices, like smartphones and laptops, along with greater internet accessibility, has led children and adolescents to spend more time on sedentary activities than they did a decade ago, and sitting in front of screens for over two hours daily is associated with reduced HRQOL[8], and poorer well-being[4,11,12]. Increased durations and frequencies of screen time were linked to unfavourable body composition and physical fitness[11], poorer behavioural and social outcomes[13], and are predictors of poor health in childhood and adolescence[12].

Research has increasingly focused on the relationship between sedentary behaviour, physical activity, and sleep duration[8,14-16]. Some studies have also explored these behaviours alongside eating habits[17,18]. For instance, investigations in Poland and France have found strong links between physical activity and healthier dietary choices, including increased intake of fruits and vegetables[7,18]. Gains in physical activity were related to a higher consumption of nutrient-dense foods compared to individuals with unchanged activity levels[7].

Understanding the relationship between physical activity, sports participation, and eating behaviours is crucial, because both are vital for preventing obesity and promoting overall health[19]. Sports, as a form of structured and often vigorous physical activity, significantly contribute to improving health outcomes[9]. Assessing the relationship between sports and physical activity, diet, sleep patterns, and sedentary screen time provides a comprehensive view of lifestyle behaviours in young people. This knowledge can help develop targeted strategies to foster sustainable, healthy habits and dietary patterns from early life.

The objective of the study was to evaluate sports and physical activity participation among 10- to 15-year-old adolescents in Albania and to explore the relationship between these activities and their dietary habits, screen time, and sleep routines.

Material and methods

We performed a cross-sectional study of 10- to 15-year-old students attending nine public secondary schools in Tirana, Albania's capital, from January 2024 to May 2024.

All procedures adhered to the ethical standards in the Helsinki Declaration of 1975, as revised in 2000, as well as the national law. Ethical approval was obtained from the Ethics Committee of the Sports University of Tirana (approval no. 11/15th of July 2022). Written informed consent was obtained from the parents or legal guardians of all participating students, and assent was obtained from the students themselves prior to participation. All data were collected anonymously, to protect participant confidentiality and privacy.

The questionnaire was created by the study authors: V. Sh. (specialist in obesity and weight management), A. N. (paediatrician), and K. T. (physiotherapist), and reviewed by two other physicians and two university professors specialized in sports and physical activity. After incorporating their feedback, the final version was pilot-tested with five children aged 10 to 15 years, to ensure clarity and appropriateness.

The questionnaire design was based on the "Health Behaviour in School-aged Children (HBSC)" surveys, World Health Organization (WHO) guidelines on diet and physical activity, and relevant literature[9,17,20]. It evaluated self-reported eating habits, sports participation, physical activity, sleep duration, and daily screen time (including television, computer/phone use for gaming, videos, and social media). Physical activity was broadly defined to include creative free play, sports, active transportation, and planned exercise beyond school physical education classes.

To assess sports engagement, participants reported how often and how long they engaged in moderate-to-vigorous intensity sports during their leisure time, specifying the type of sport, in accordance with the WHO definition[9]. General physical activity was evaluated based on the frequency of activities that caused sweating or an increased heart rate during free time. Additional items explored active commuting to school (e.g., walking or cycling), as well as time spent in outdoor play or doing household chores, including their duration and type.

Total physical activity was calculated by combining physical education classes, free play, organized sports, gym workouts, and active transportation. Students participating in any extracurricular physical activity were classified as physically active. Those reporting an average of at least 60 minutes of physical activity per day were regarded as having met the WHO recommendations[9].

The dietary assessment covered the intake of calorie-dense, nutrient-poor foods (such as fast foods, sweets, sweetened beverages, energy drinks), the

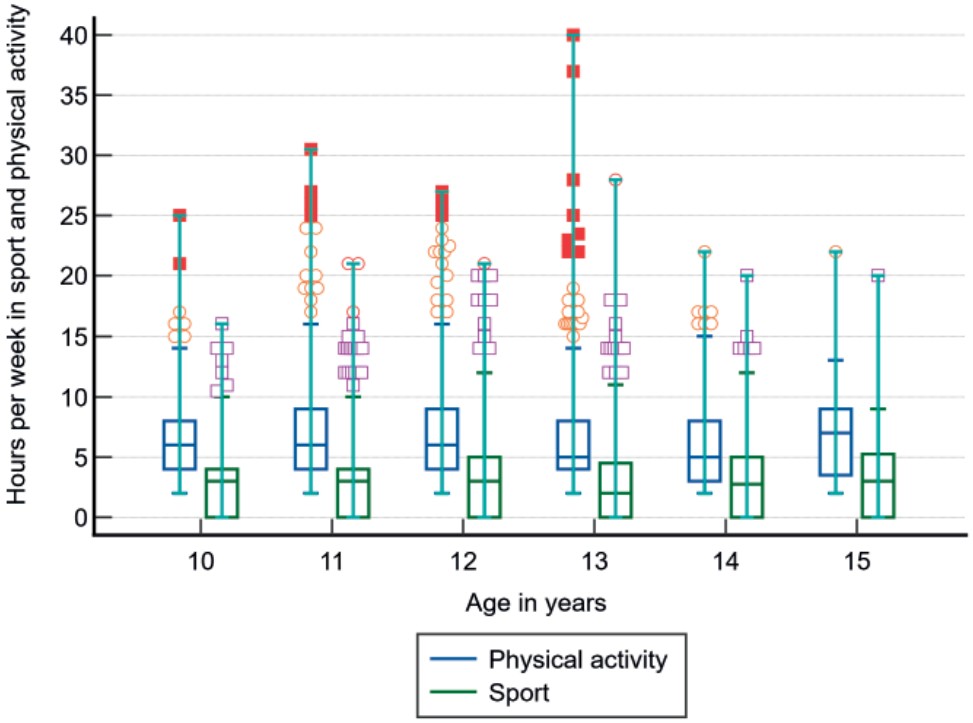


Fig. 1. Average weekly hours dedicated to sports and extracurricular physical activities categorized by age group.

consumption of takeaway foods, and eating while using screens. The frequency of fruit, vegetable, and dairy intake was also documented.

Sleep patterns and screen time were evaluated through self-reported questions. Screen time encompassed watching TV, using computers or tablets, playing video games, and using phones for social media and other activities.

The survey included questions about participants' sleep patterns and the amount of time they spent each day watching television, using computers, laptops, iPads, tablets, video games, as well as engaging with their phones for social media and other activities.

Anthropometric measurements (weight and height) were obtained by trained physicians and physiotherapists during school visits within physical education classes.

Body mass index (BMI) was calculated and classified based on WHO growth curves for ages 5-19 years[21]. Overweight was defined as a BMI at or above the 85th percentile but below the 95th percentile; obesity as a BMI at or above the 95th percentile; extreme obesity as a BMI at or above 120% of the 95th percentile or ≥35 kg/m^2.

The participants were divided into two groups based on sports participation status and compared in terms of screen time, sleep duration, and dietary habits to evaluate the connection between sports involvement and lifestyle behaviours.

Statistical Analysis

Descriptive statistics summarizing sample characteristics and outcome variables are presented as means with standard deviations or proportions. Student's t-tests and chi-square tests assess differences between groups for continuous and categorical variables, respectively. Binary logistic regression models evaluate associations between sports participation (exposure) and lifestyle factors (dietary habits, screen time, sleep duration). The results are reported as odds ratios (OR) with 95% confidence intervals (CI). A p-value ≤ 0.05 is considered statistically significant. All analyses were conducted using IBM SPSS Statistics, version 20.

Results

A total of 2,020 students participated in the survey, comprising 48.9% girls and 51.1% boys, with a mean age of 11.98±1.25 years (range 10–15 years). Among them, 1,343 students (66.5%) reported participating in sports, including 791 boys (76.65% of boys) and 552 girls (55.87% of girls). Figure 1 illustrates the weekly hours spent on sports and extracurricular physical activities by age group. Sports participation was highest among 11-year-olds (71.9%), followed by 15-year-olds (70.6%), 10-year-olds (69.7%), and 12-year-olds (68.8%). The lowest participation rates were observed for 13- and 14-year-olds, at 60.2% and 57.1%, respectively.

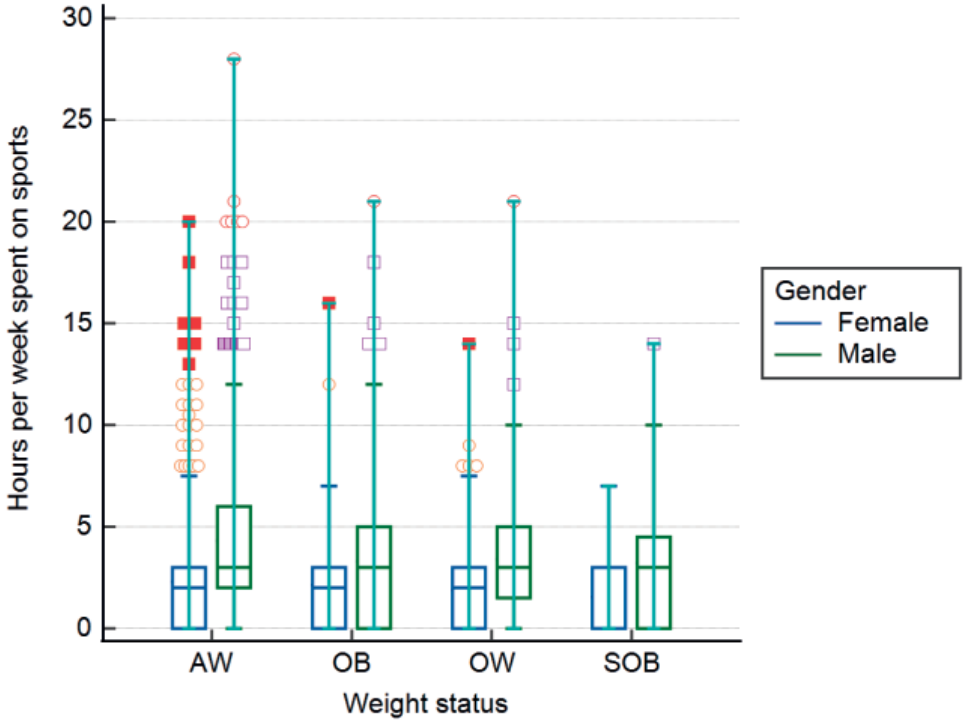


Fig. 2. Comparison of weekly sports hours by weight status (AW-average weight, OW-overweight, OB-obese, SOB-severely obese) and gender among participants.

Regarding body weight status, 1,272 students (63%) were below the 85th percentile for BMI according to WHO growth charts and were classified as having average body weight, 422 (20.9%) were classified as overweight, 251 (12.4%) as obese, and 75 (3.7%) as extremely obese.

Boys spent significantly more hours per week on sports than girls did and had higher odds of engaging in sports (OR = 2.59, 95% CI: 2.14–3.14, p < 0.0001). Among boys, those without excess body weight devoted more time to sports than their overweight or obese peers did (mean 3.34 ± 3.56 vs. 2.74 ± 2.94 hours/week, p = 0.0001).

No significant difference in sports participation time was observed between girls with and without excess body weight (Figure 2).

Similarly, boys without excess body weight were inclined to spend more time in overall physical activity than their overweight or obese counterparts were, although this difference was not statistically significant (6.77±4.31 vs. 6.43±3.88 hours/week, p = 0.07).

Students who took part in sports spent significantly more time on physical activity than nonparticipants (8.23±3.99 vs. 3.49±2.22 hours per week, p < 0.0001). Those involved in sports also spent less time in front of screens daily than nonparticipants (2.63±1.56 vs. 2.87±1.78 hours per day, p = 0.001), although there was no difference in average sleep duration between the groups (8.64±1.37 vs. 8.71±1.02 hours per night, p = 0.1) (Figure 3).

Only 220 students (16.38% of those participating in sports and 10.9% of all participants) met WHO recommendations of at least 60 minutes of moderate-to-vigorous physical activity daily. By weight status, 12.5% (n = 159) of students without excess weight met this guideline, compared with 8.05% of overweight (n = 34), 8.37% of obese (n = 21), and 8% of severely obese students (n = 6), a statistically significant difference (p = 0.002). Physical activity levels declined progressively as weight status increased.

Participants involved in sports had higher odds of consuming three or more portions of fruits and vegetables daily (OR = 1.64, 95% CI: 1.24–2.17, p = 0.0005). Non-sport participants were more likely to consume takeaway food (OR = 1.30, 95% CI: 0.98–1.71, p = 0.05) and to eat while using screens (OR = 1.50, 95% CI: 1.06–2.12, p = 0.02). 336 students were physically inactive (16.6% of the sample) and were more likely to eat while using screens compared to active peers (OR = 1.72, 95% CI: 1.13–2.64, p = 0.01) and had lower odds of consuming three or more portions of fruits and vegetables daily (OR = 1.50, 95% CI: 1.07–2.09, p = 0.01).

No significant differences were observed in other dietary habits between sports participants and non-participants or between physically active and inactive groups.

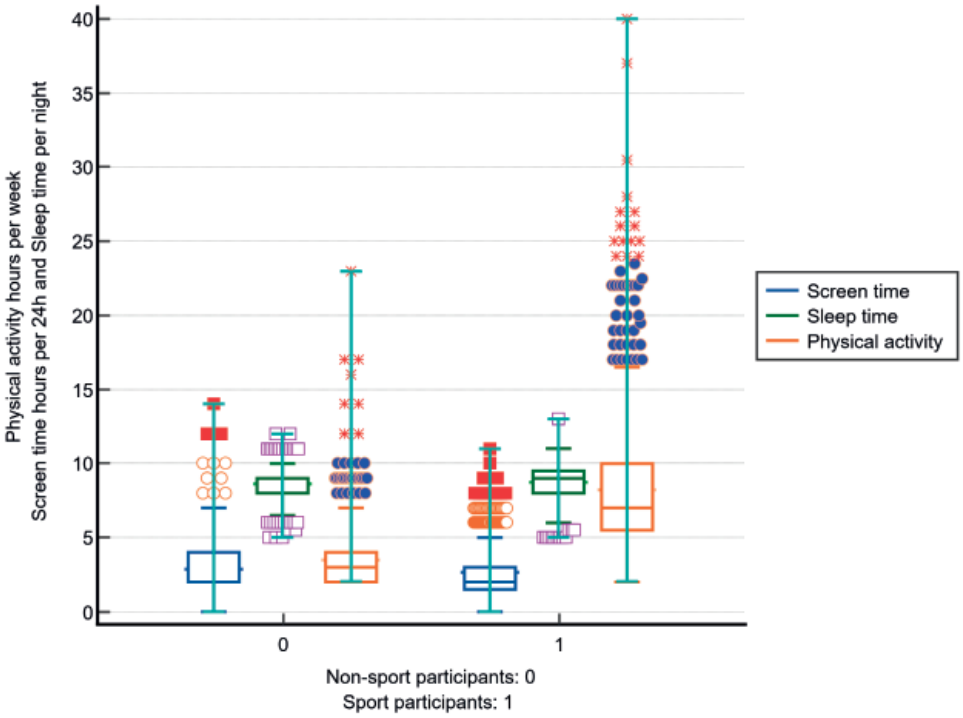


Fig. 3. Daily screen time, average nightly sleep duration, and total weekly hours spent on physical activities by adolescents according to their participation in sports.

Overall dietary habits in the study population were as follows: 60.9% ate breakfast daily, 93.3% regularly consumed dairy products, 55.9% ate three or more portions of fruits and vegetables each day, 72.9% consumed energy-dense sweet foods daily, 61.5% ate fast food daily, 58.0% ate while using screens, 45.4% regularly consumed foods prepared outside the home (restaurants or fast food), and 56.0% drank sugar-sweetened beverages or energy drinks daily.

Discussion

This study demonstrates that regular participation in sports and physical activities among early adolescents is associated with healthier lifestyle behaviours. Students who engaged in sports exhibited longer durations of physical activity, spent less time in sedentary activities in front of screens, tended to have longer sleep durations, and reported healthier dietary habits compared to their non-sporting peers. Establishing these positive habits early in life is crucial for preventing obesity during adolescence and later in adulthood, providing a foundation for sustained health and reducing the risks of chronic diseases associated with sedentary behaviours and unhealthy lifestyles[1,9,10].

Physical activity remains one of the most effective strategies to prevent overweight and obesity[1,4,9]. In this sample, 20.9% of participants were overweight, 1616.1% obese (including 3.7% extremely obese), exceeding WHO estimates and highlighting the severity of the obesity epidemic among Albanian adolescents[22]. This emphasizes the need to examine and address lifestyle factors that influence weight status in this population.

Notably, boys of average weight were significantly more physically active and participated more in sports than their overweight or obese counterparts, whereas no such differences were observed among girls. These findings warrant further investigation to identify barriers limiting sports participation among overweight or obese youth in Albania. Tailored strategies are urgently needed to promote physical activity and sports engagement, especially for overweight and obese children[22-24]. Evidence supports physical activity as a cornerstone for effective weight management in youth[1,9], with systematic reviews indicating its beneficial impact on BMI over the medium to long term in adolescents[25,26].

Physical activity, alone or combined with dietary interventions, reduces the risk of obesity in school-age children and adolescents[20]. Our study revealed an association between insufficient physical activity and unhealthy dietary patterns, highlighting the importance of engaging in physical activity, not only as a positive factor in itself, but also because it is linked to healthier dietary patterns, particularly among individuals who are overweight or obese.

The guidelines aim to prevent obesity by promoting healthy lifestyles, diets, physical activity, and an environment that supports these healthy lifestyle patterns[9].

The guidelines regard clinicians as vital educators and advocates in promoting healthy daily habits and helping prevent excessive weight gain[27]. Clinicians have a crucial role in informing the population about healthy eating and physical activity. They should also encourage schools to actively teach children and adolescents to adopt healthy eating habits and lifestyles[4,27,28]. School-based interventions can reach a large number of children, increasing the effectiveness of programs aimed at reducing sedentary behaviours, both within schools and the wider community[28,29].

Despite 66.5% of our participants reporting engagement in sports, only about 10% met WHO recommendations for daily moderate-to-vigorous physical activity, with girls markedly less active than boys. The observed gender gap (5.87% girls vs. 15.69% boys meeting guidelines) is larger than that reported in other European or global surveys[1,17], highlighting the urgent need for policies that promote girls' participation in physical activity[10]. Consistent with other studies, boys were more active and engaged in sports more frequently than girls, with a gender difference in sports participation of approximately 21%[1,2,30].

Sleep duration and sedentary screen time are important lifestyle factors influencing dietary intake and weight status. Although sports participants had slightly longer sleep durations, differences were not statistically significant. However, sports engagement was associated with reduced leisure screen time. Prior research has linked insufficient sleep to increased risk of overweight and obesity in youth, as well as greater consumption of energy-dense, nutrient-poor foods[8,31-34]. Screen time further exacerbates these risks by promoting sedentary behaviour, lowering fitness levels, and negatively impacting mental and social well-being[4,11-13]. The bidirectional relationship between sleep deprivation and screen use creates a cycle that may reinforce unhealthy eating patterns and obesity risk[35-37].

Our data showed that physically inactive youth spent more time in front of screens and were more likely to eat while using them, suggesting that even moderate physical activity might help offset sedentary habits. However, the study by Mijarra-Murillo and colleagues on Spanish children and adolescents found no significant link between physical activity and sedentary behaviours, indicating that individuals can engage in both without restricting one another[15].

Digital technology, when used effectively, also has the potential to promote physical activity through interactive programs, especially among females who tend to be less active[4,38,39]. Nonetheless, efforts to reduce screen time remain essential, alongside encouraging greater participation in physical activity and sports.

The healthier dietary patterns observed among sports participants, particularly increased consumption of fruits and vegetables, align with previous findings that associate physical activity with improved diet quality and a lower risk of chronic diseases[2,3].

Promoting sports participation and physical activity is thus an essential part of public health strategies aimed at improving youth wellbeing. School-based physical education and organized sports contribute to higher activity levels and improved muscular fitness, emphasizing the importance of incorporating structured physical activity into education[40]. Furthermore, parental and adult involvement is vital in shaping children's physical activity behaviours, underlining the necessity for community-wide engagement[27-29,41].

Based on our findings, public health policymakers and educators should prioritize integrating structured sports and physical activity programs within school curricula and community initiatives[9,42]. Investments in accessible sports facilities and promoting sports within schools and communities could provide an affordable and accessible strategy to improve overall adolescent health.

Limitations of the study

This study is limited by its focus on nine public schools in Tirana, which may restrict the generalizability across Albania. Nonetheless, the sample size is substantial and provides valuable insights into the lifestyles of urban adolescents. Self-reported data on lifestyle and dietary habits are prone to recall bias, and time-use diaries could provide more accurate tracking of behaviours. Additionally, sedentary activities outside screen time (e.g., sitting during school or homework) and variations in types of screen usage (interactive versus passive) were not examined, which may influence interpretations[11].

Conclusions

Participation in sports among adolescents in Tirana, Albania, is associated with healthier lifestyle habits, including increased consumption of fruits and vegetables and reduced screen time. However, most young people do not meet WHO guidelines for daily physical activity, especially those with excess weight. These results highlight the urgent need for community and school-based programs to encourage sports involvement and active living. Promoting sports

participation is crucial in preventing obesity and supporting the long-term health and well-being of young populations.

Author Contributions:

Conceptualization, V.SH.; methodology, V.SH and ΧH.F.P.; software, V.SH.; validation, K.T. and A.N.; formal analysis, V.SH.; investigation, K.T and A.S.I.; resources, A.SH.; data curation, V.SH. and K.T.; writing–original draft preparation, V.SH; writing–review and editing, V.SH, ΧH.F.P., K.T., A.N., A.SH. and A.S.I.; visualization, V.SH. and A.N.; supervision, V.SH; project administration, V.SH and K.T. All the authors have read and agreed with the final version of the article.

Compliance with Ethics Requirements:

"The authors declare no conflict of interest regarding this article"

"The authors declare that all the procedures and experiments of this study respect the ethical standards in the Helsinki Declaration of 1975, as revised in 2008(5), as well as the national law. Written informed consent was obtained from the parents or legal guardians of all participating students, and assent was obtained from the students themselves prior to participation."

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