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SPORT PARTICIPATION, SOCIAL MEDIA USE, AND MENTAL HEALTH OF SERBIAN ADOLESCENTS

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ABSTRACT

Adolescents today encounter numerous challenges with their physical and mental well-being, particularly due to insufficient physical activity and intensive social media use. The aim of this study was to examine differences between students who engage in sports and those who do not. Indicators included self-rated health, life satisfaction, frequency of psychosomatic complaints, and the risk of social media use. The sample consisted of 1,761 students (843 males) from the 5th and 7th grades. About 72% participated in organized sports, and over half had been active for more than three years. Overall, 61% rated their health as excellent and 31% as very good, while 70% reported high life satisfaction. The most common psychosomatic complaints were nervousness (56%), irritability (43%), and sleep problems (35%). YouTube was the most frequently used platform (90%), followed by Viber, TikTok, and Snapchat. Regarding problematic social media use, 39% were at moderate risk, and 55% were not at risk. Compared to their non-athletic peers, student-athletes demonstrated better self-rated health, higher life satisfaction, fewer psychosomatic symptoms, and a lower likelihood of problematic social media use.

Key words: self-rated health, life satisfaction, health complaints, primary school children, social media usage

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INTRODUCTION

According to the World Health Organization (WHO, 2022), adolescence is a sensitive developmental stage during which key behavioral patterns are formed, with long-term implications for both physical and mental health.In the post-pandemic context, young people face numerous challenges, including insufficient physical activity, excessive use of digital technologies, and a rise in mental health problems (Guthold et al., 2022; Bull et al., 2024). Physical inactivity and sedentary behavior are recognized as risk factors for various noncommunicable diseases, including depression, whose prevalence among adolescents continues to increase (WHO, 2019; 2022).

In Serbia, available data indicate a concerning trend of low physical activity among youth. Fewer than half of fifth-grade students and only about one-quarter of seventh-grade students meet the recommended levels of daily physical activity (Gudelj et al., 2023), while around two-thirds of children participate in organized sports, with boys participating more often than girls (Institute of Public Health of Serbia, 2021). At the same time, modern adolescence is marked by high exposure to digital media and social networking platforms, whose excessive use may be associated with lower well-being, sleep problems, anxiety, and depressive symptoms (van den Eijnden et al., 2016; Glumbić et al., 2020).

Numerous studies confirm the positive impact of physical activity on various aspects of adolescents' mental health. Higher levels of physical activity are linked to greater life satisfaction, better self-rated health, and fewer psychosomatic complaints (Rodriguez-Ayllon et al., 2019; Lukács et al., 2020; Đorđić et al., 2024). The importance of organized sports participation is particularly emphasized, as it contributes not only to physical benefits but also to social connectedness, self-confidence, and a sense of belonging (Guddal et al., 2019).

Despite the well-documented benefits, research on the interrelations between organized sport participation, social media use, and mental health among younger adolescents in Serbia remains scarce. Given the post-pandemic shifts in lifestyle and behavioral patterns, it is essential to examine how these factors jointly affect primary school students' overall well-being.

The aim of this study was to determine the differences between students who engage in sports and those who do not. The analyzed indicators included self-rated health, life satisfaction, and the frequency of subjective health complaints, along with an assessment of social media addiction using the Social Media Disorder Scale (SMD).

MATERIAL AND METHODS

Participants

The study included 1,761 primary school students from the province of Vojvodina, Serbia. The sample consisted of 843 boys and 918 girls, attending the 5th grade (n = 926) and the 7th grade (n = 832). Data was collected during regular school classes in cooperation with physical education teachers. The research was conducted with

the approval of school administrations and parents, and student participation was voluntary and anonymous.

Procedures

Organized sport participation was assessed using a dichotomous question ("Do you currently participate in organized sport activities in a club?" – *yes/no*). Further, organized sport was defined as any structured activity conducted under professional supervision, including both recreational and competitive forms (Marques et al., 2016; Kokko et al., 2019).

To assess social media use, the SMD (van den Eijnden et al., 2016) was applied. The scale consists of nine items measuring symptoms of problematic use (e.g., preoccupation, conflicts, loss of control). Based on the total number of affirmative responses, participants were classified into three categories:

- *no risk* (0–1 symptom),
- *moderate risk* (2–5 symptoms),
- *problematic use* (6–9 symptoms).

Additionally, students reported their daily usage of the most popular platforms (YouTube, Viber, TikTok, Snapchat, Instagram, etc.).

The assessment of mental health was conducted using standardized questions from the HBSC Protocol (2023) and included the following indicators:

- Self-rated health (excellent, very good, good, poor),
- Life satisfaction (on a scale from 0 to 10, where 0 represents the worst possible life and 10 the best possible life),
- Psychosomatic complaints (headache, stomach pain, back pain, feeling low, irritability or bad mood, nervousness, difficulty falling asleep, dizziness).

Statistical analysis

For parametric data, the mean (Mean), standard deviation (SD), and minimum and maximum values were calculated, while for categorical data, absolute and relative frequencies were determined. Differences between groups (athletes vs. non-athletes; gender) were tested using the independent-samples t-test and the chi-square test for categorical variables. The level of statistical significance was set at $p \leq .05$.

RESULTS

The final sample consisted of 1,003 participants (493 boys, 510 girls), students in the fifth and seventh grades of primary schools in the South Bačka District. The sample was well balanced in terms of gender and age structure (Table 1).

Table 1. Basic characteristics of the sample

	Grade		
Gender	**5th**	**7th**	**Total**
Boys	269 (54.6%)	224 (45.4%)	493 (100.0%)
Girls	282 (55.3%)	228 (44.7%)	510 (100.0%)
Total	551 (54.9%)	452 (45.1%)	1003 (100.0%)

To assess sports participation, we used a dichotomous variable for organized participation in sports at a sports club (Yes/No). Nearly three-quarters of the participants are engaged in organized sports/exercise at a sports club. Boys were significantly more likely than girls to participate in organized sports: 78% of boys and 69% of girls reported involvement in sports clubs.

Table 2. Gender differences in organized sports participation

	Organized sports participation		
Gender	**Yes**	**No**	**Total**
Boys	384 (77.9%)	109 (22.1%)	493 (100.0%)
Girls	350 (68.6%)	160 (31.4%)	510 (100.0%)
Total	734 (73.2%)	269 (26.8%)	1003 (100.0%)

Problematic use of social media

Athletes are at lower risk of problematic social media use compared to non-athletes (Table 3). Based on the chi-square test, this relationship is statistically significant. Approximately 58% of athletes are at no risk, compared to 44% of non-athletes. Conversely, non-athletes are more represented in the categories of "moderate risk" and "problematic use."

Table 3. Problematic social media use among athletes and non-athletes

Sport participation	**Problematic social media usage**			
	No risk	**Moderate risk**	**Problematic**	**Total**
Athletes	419 (57.6%)	275 (37.8%)	33 (4.5%)	727 (100.0%)
Non-athletes	119 (44.4%)	126 (47.0%)	23 (8.6%)	268 (100.0%)
Total	538 (54.1%)	401 (40.3%)	56 (5.6%)	995 (100.0%)
$\chi 2$ (2, N = 995) = 16.13, p = .00				

When individual social media platforms were examined, significant differences between athletes and non-athletes were observed only for Pinterest and Messenger. Pinterest is used by 28% of athletes and 39% of non-athletes (χ^2 (1, N = 1,003) = 11.92, p = .00), while Messenger is used by 14% of athletes and 8% of non-athletes (χ^2 (1, N = 1,003) = 4.84, p = .03).

Physical activity and mental health

Self-rated health. Participants engaged in organized sports rated their health significantly more positively, as confirmed by chi-square tests (Table 4). 63% of athletes rated their health as "excellent," compared to 44% of non-athletes. Meanwhile, 36% of athletes rated their health as "very good/good," compared to 53% of non-athletes.

Table 4. Self-rated health among athletes and non-athletes

Sport participation	Self-related health				
	Excellent	**Very good**	**Good**	**Poor**	**Total**
Athletes	463 (63.1%)	226 (30.8%)	37 (5.0%)	8 (1.1%)	734 (100.0%)
Non-athletes	118 (43.9%)	109 (40.5%)	34 (12.6%)	8 (3.0%)	269 (100.0%)
Total	581 (57.9%)	335 (33.4%)	71 (7.1%)	16 (1.6%)	1003 (100.0%)
$\chi2$ (3, N = 1003) = 38.56, p = .00					

Life satisfaction. Participants rated their current life satisfaction on a scale from 0 to 10, where 0 indicates the lowest satisfaction and 10 indicates the highest. An independent samples t-test examined the significance of differences in mean life satisfaction scores between athletes and non-athletes (Table 5). Athletes reported significantly higher life satisfaction (Mean = 7.9) compared to non-athletes (Mean = 7.5).

Table 5. Life satisfaction among athletes and non-athletes

Athletes (n=488)		**Non-athletes (n=508)**		**t**	p
Mean	SD	Mean	SD		
7.9	1.8	7.5	1.9	3.46	.001

Psychosomatic complaints. Differences in the frequency of psychosomatic complaints among adolescent athletes and non-athletes were examined using chi-square tests (Table 6).

Table 6. Frequency of psychosomatic complaints among athletes and non-athletes

Psychosomatic complaints	**Sport participation**	**Once a week or less**	**More than once a week**	**$\chi2$ test**
Headache	Athletes	653 (89.1%)	80 (10.9%)	$\chi2$ (1, N = 1000) = 4.42, p = .04
	Non-athletes	224 (83.9%)	43 (16.1%)	
	Total	877 (87.7%)	123 (12.3%)	

Stomach pain	Athletes	659 (90.0%)	73 (10.0%)	$\chi2$ (1, N = 999) = 6.58, p = .01
	Non-athletes	224 (83.9%)	43 (16.1%)	
	Total	883 (88.4%)	116 (11.6%)	
Back pain	Athletes	635 (86.7%)	97 (13.3%)	$\chi2$ (1, N = 998) = 3.77, p = .05
	Non-athletes	217 (81.6%)	49 (19.4%)	
	Total	852 (85.4%)	147 (14.6%)	
Depression	Athletes	632 (86.6%)	98 (13.4%)	$\chi2$ (1, N = 996) = 18.68, p = .00
	Non-athletes	199 (74.8%)	67 (25.2%)	
	Total	831 (83.4%)	165 (16.6%)	
Irritability	Athletes	581 (79.3%)	152 (20.7%)	$\chi2$ (1, N = 999) = 14.71, p = .00
	Non-athletes	179 (67.3%)	87 (32.7%)	
	Total	760 (76.1%)	240 (23.9%)	
Nervousness	Athletes	496 (67.9%)	234 (32.1%)	$\chi2$ (1, N = 996) = 11.64, p = .00
	Non-athletes	149 (56.0%)	117 (44.0%)	
	Total	645 (64.8%)	353 (35.2%)	
Difficulty falling a sleep	Athletes	561 (76.6%)	171 (23.4%)	$\chi2$ (1, N = 999) = 15.21, p = .00
	Non-athletes	171 (64.0%)	96 (36.0%)	
	Total	732 (73.3%)	267 (26.7%)	
Dizziness	Athletes	681 (92.9%)	52 (7.1%)	$\chi2$ (1, N = 1000) = 10.22, p = .00
	Non-athletes	230 (86.1%)	37 (13.9%)	
	Total	911 (91.1%)	89 (8.9%)	

As shown in the table, participants engaged in organized sports had a significantly lower prevalence of psychosomatic complaints than their non-athlete peers, with significant levels for all observed indicators at or below the defined threshold ($p \leq .05$).

Differences were most pronounced for difficulty falling asleep, irritability, nervousness, and depression. Difficulties falling asleep more than once a week were reported by 23% of athletes and 36% of non-athletes; irritability by 21% of athletes and 33% of non-athletes; nervousness by 32% of athletes and 44% of non-athletes; and depression by 13% of athletes and 25% of non-athletes. The group of athletes also reported better outcomes for dizziness, stomach pain, headaches, and back pain.

DISCUSSION

The present study examined the associations between organized sports participation, physical activity, social media use, and indicators of physical and mental health among adolescents in the South Bačka District. The findings indicate that adolescents engaged in organized sports report better self-rated health, higher life satisfaction, fewer psychosomatic complaints, and a lower risk of problematic social media use compared with their non-athlete peers. These results further support the substantial body of evidence emphasizing the protective role of structured physical activity during adolescence (Bell et al., 2019; Guddal et al., 2019; Boelens et al., 2021).

The adolescent population in the South Bačka District is predominantly exposed to urban and semi-urban living conditions, characterized by relatively good availability of sports clubs, but also by high levels of sedentary behavior and intensive use of digital media. School obligations, screen-based leisure activities, and reduced opportunities for unstructured outdoor play increasingly shape adolescents' daily routines. In this context, organized sports represent one of the few consistent and structured opportunities for regular physical activity, social interaction, and psychological regulation. The observed associations between sports participation and favorable health outcomes therefore reflect not only individual behavior, but also the broader lifestyle context of this population.

Consistent with previous studies, boys were more likely to participate in organized sports than girls (Kokko et al., 2019; Lagestad et al., 2019). This gender disparity may be attributed to cultural norms, differences in sport availability, and gender-specific barriers to participation. Although a substantial proportion of girls were engaged in sports, the lower participation rate among girls may partly explain gender differences in physical activity levels and related health outcomes. These findings highlight the importance of developing gender-sensitive sport programs that better address girls' preferences, motivations, and perceived barriers, particularly during early adolescence.

Adolescents involved in organized sports also demonstrated a lower prevalence of problematic social media use. This finding aligns with previous research suggesting that structured extracurricular activities may reduce excessive screen time by providing meaningful alternatives for leisure and social engagement (Canadian Paediatric Society, 2019; Twenge et al., 2021). In the context of widespread access to social media platforms such as YouTube, TikTok, and messaging applications, organized sports may help establish more balanced daily routines, contributing to healthier patterns of digital media use.

Mental health outcomes were notably more favorable among adolescent athletes. Lower frequencies of psychosomatic complaints—including headaches, back pain, irritability, nervousness, depressive symptoms, and sleep difficulties—were observed in comparison with non-athletes. These results are consistent with evidence indicating that physical activity promotes mental well-being through multiple mechanisms, such as stress reduction, improved sleep quality, emotional regulation, and enhanced

resilience (Jewett et al., 2014; Ho et al., 2015; Rodriguez-Ayllon et al., 2019). The particularly pronounced differences in sleep problems, irritability, nervousness, and depressive symptoms are comparable, and in some cases slightly more pronounced, than those reported in studies from other European contexts (Guddal et al., 2019; Wiklund et al., 2025), potentially reflecting post-pandemic lifestyle changes and high screen exposure among Serbian adolescents.

Higher levels of self-rated health and life satisfaction among adolescents participating in organized sports further corroborate findings from longitudinal and cross-sectional studies linking sports engagement to improved subjective well-being (Adachi & Willoughby, 2014; Murray et al., 2021; Upenieks et al., 2025). Given that adolescence is a critical developmental period marked by increased vulnerability to mental health difficulties (WHO, 2022; Cosma et al., 2021), these associations underscore the importance of structured physical activity as a protective factor.

From a practical perspective, the results suggest that organized sports can serve as an effective public health tool for improving adolescents' quality of life in the South Bačka District. Team sports appear particularly beneficial for boys, offering opportunities for social integration and emotional regulation, while providing diverse, non-competitive, and recreational forms of physical activity—such as dance, fitness programs, gymnastics, and athletics—may be especially important for increasing participation and well-being among girls. For adolescents not involved in sports clubs, school-based and community programs with low entry barriers may represent a viable strategy to promote regular physical activity and reduce sedentary behavior.

The study's cross-sectional design limits causal interpretation, and the reliance on self-reported measures may introduce reporting bias. Future research should incorporate longitudinal designs, objective measures of physical activity, and psychosocial variables such as motivation, peer influence, and family support to further clarify the mechanisms linking organized sports participation and adolescent well-being.

CONCLUSION

This study demonstrates that participation in organized sports is associated with more favorable physical and mental health outcomes among adolescents in the South Bačka District. Adolescents engaged in organized sports reported better self-rated health, higher life satisfaction, fewer psychosomatic complaints, and a lower risk of problematic social media use compared with their non-athlete peers. These findings reinforce existing evidence that structured sports participation represents an important protective factor during adolescence.

Despite persistent gender differences in sports participation, organized sports appear to be an accessible and effective avenue for promoting adolescent health in this population. Health promotion strategies should therefore prioritize the development of gender-sensitive, context-specific physical activity programs that account for adolescents' everyday living conditions, leisure habits, and preferences. Expanding access to diverse forms of organized and recreational physical activity—particularly

those appealing to girls—and strengthening school- and community-based programs may contribute to meaningful improvements in adolescents' quality of life.

Although causal conclusions cannot be drawn, the results highlight the potential of organized sports as a feasible public health strategy to counteract declining physical activity levels, excessive screen use, and mental health challenges among youth. Future longitudinal research is needed to confirm these associations and inform sustainable interventions to foster long-term engagement in physical activity among adolescents.

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