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Monitoring gender disparities in sedentary behavior, physical activity, and internet usage among adolescents

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Abstract: This study explores gender differences in physical activity and internet usage among adolescents, focusing on how prolonged screen time may impact activity levels in urban and rural areas of Tirana. A cross-sectional survey was conducted with 2,030 adolescents, using the Physical Activity Questionnaire for Adolescents (PAQ-A) and the Internet Addiction Test (IAT) to assess activity levels and internet use. The sample included 26.8% urban females, 26.5% rural females, 23.3% urban males, and 23.4% rural males. Statistical analysis using Pearson correlation examined associations between psychosocial traits and screen time. Findings indicate that female adolescents, especially in urban areas, reported higher internet use, with 48.9% of urban and 40% of rural females exhibiting greater screen engagement. The most common internet usage ranged between 2–4 hours daily, particularly among urban females (26.6%). Rural males showed strong correlations between internet usage and traits such as Salience Trains and Excessive Use (r = 0.741), and Impatience Expectation (r = 0.659). Urban males showed strong associations between Excessive Use and Lack of Control (r = 0.631). No signs of internet dependency were identified. The study highlights the need for gender- and location-specific health strategies to address sedentary behavior, offering valuable insights for educators, policymakers, and health professionals.

Keywords: *Adolescents, Gender disparities, Internet usage, Physical activity, Sedentary life.*

1. Introduction

Adolescents, known as the "technology generation," are increasingly using digital devices for learning and socializing, resulting in more sedentary lifestyles. While technology offers benefits, it raises health concerns like obesity, cardiovascular diseases, and type II diabetes. Excessive screen time and inadequate physical activity heighten these risks, highlighting the need for research and interventions. Even meeting public health guidelines of 150 minutes of moderate weekly activity does not fully offset the dangers of prolonged sedentary behavior. Urban adolescents, such as those in Tirana, Albania, face added challenges, including limited recreational spaces and easy access to digital entertainment. Despite the well-documented benefits of physical activity, most adolescents fail to meet recommended levels, such as 60 minutes of daily moderate-to-vigorous activity and restricting recreational screen time to two hours. This study examines the physical activity and internet use patterns of Tirana adolescents, emphasizing gender differences. Using tools like the Physical Activity Questionnaire for Adolescents (PAQ-A) and the Internet Addiction Test (IAT), it aims to analyze the relationship between sedentary behavior, physical activity, and digital habits. The findings seek to inform strategies integrating health, education, and technology to promote active, healthier lifestyles and address the unique challenges of urban adolescents in a digital era. Various social, environmental, and biological factors contribute to the decline in physical

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activity as children transition into adolescence. While younger children frequently participate in school activities, sports, and traditional games, engagement in physical exercise tends to decrease with age as other interests take priority. Since school occupies a large portion of children's daily lives, it provides a crucial setting for promoting physical activity through recess and physical education. Participating in sport is important for a better self-esteem because of better posture behavior [1].

However, extended sedentary time at school has been linked to obesity, with prolonged television viewing further reducing activity levels [2]. While a balance between sedentary and active behaviors is possible, modern influences such as urbanization, automation, and digital entertainment continue to limit physical activity. Understanding these factors can help develop targeted interventions to promote active lifestyles among adolescents. Health organizations, including the American Academy of Pediatrics (AAP), and the American College of Sports Medicine (ACSM), recommend at least 60 minutes of moderate-to-vigorous activity five days a week to support overall health and reduce the risk of chronic diseases [3, 4]. Regular exercise not only lowers the risk of cardiovascular conditions but also enhances motor coordination and nervous system function. However, global data indicate that only one-third of adolescents achieve the recommended activity levels, increasing their susceptibility to obesity, type 2 diabetes, and coronary artery disease [5]. Given the long-term health risks associated with physical inactivity, promoting exercise among adolescents is essential for fostering lifelong well-being. Physical activity is widely recognized for its role in enhancing emotions and promoting psychological well-being, while sedentary behavior can deplete psychosocial resources. Regular exercise is often recommended as part of emotional disorder treatments and is linked to positive outcomes, including stronger social connections and a healthier lifestyle [6]. According to Fredrickson [7] broaden-and-build theory, positive emotions expand awareness, fostering resilience and personal growth.

Research shows that physical activity contributes to self-efficacy, creativity, and overall emotional well-being [8-10]. It enhances positive emotions while reducing negative ones, supporting better psychological and social states [11]. Physically active youth report higher self-esteem and body satisfaction, with exercise improving self-perception regardless of body weight changes and its posture [12, 13]. Additionally, in adults, increased physical activity has been linked to better mental and physical health than merely reducing sedentary time [14]. Adolescence involves significant biological, psychological, and social changes, requiring adaptation to new physical and developmental challenges, identity formation, and evolving relationships [15, 16]. The internet has become a major part of adolescent life, with both boys and girls spending considerable time online for communication, entertainment, and information [17, 18].

Referring to Rideout, et al. [19] girls often use social media to strengthen friendships, while boys use it for socializing and addressing personal issues**.** Also, Jain and Stemper [20] detected that internet use has become integral to adolescents' development, supporting identity exploration, relationships, and academic growth. Educational institutions must adapt to technological advancements and e-learning trends. However, excessive internet use can lead to sedentary behavior, which carries health risks. Video games, a key part of digital entertainment, have grown in popularity and often combine physical movement with gaming [21] though the effects on physical and mental health remain debated. Adolescents, especially boys, may use video games to cope with social pressures highlighting the role of societal expectations in shaping gaming habits [22, 23].

Conversely, excessive media exposure, such as watching TV and playing video games, is associated with lower self-esteem reducing posture stability too, reduced prosocial behavior, and increased aggression [24]. The American Academy of Pediatrics [3] suggests that limiting screen time reduces exposure to harmful messages, improving self-image and behavior. Carson, et al. [25] also highlight that reducing screen time encourages more physical activity, which in turn boosts self-efficacy and self-esteem. Given the strong link between sedentary behaviors and psychological challenges, promoting a balance between physical activity and media consumption is essential for overall well-being.

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2. Methodology

2.1. Study Participant

The participants in this study were adolescents aged 12 to 18 years, selected from 9-year primary and secondary schools in the Tirana region. A total of 2,030 adolescents participated, representing a diverse sample of students from both urban and suburban schools in Tirana city and the surrounding district. The sample consisted of 1,017 students from urban schools in the city of Tirana and 1,013 students from suburban schools in the Tirana district. To ensure a representative sample, cluster sampling was employed. Schools were randomly selected from a list provided by the Tirana Regional Education Directorate and the Tirana District Education Directorate, and students were chosen randomly within each selected school. The sample was balanced in terms of gender, with 26.8% female students in urban schools and 23.3% male students, and 26.5% female and 23.4% male in suburban schools, reflecting the regional gender distribution.

2.2. Instrument of the study

The study utilized two validated instruments to measure key variables: physical activity, internet use, and psychosocial health, respectively a) Physical Activity Questionnaire for Adolescents (PAQ-A) and b) Internet Addiction Test (IAT). The PAQ-A is a well-established tool for assessing physical activity levels among adolescents. It includes eight questions that capture the frequency and intensity of various physical activities such as walking, biking, and sports [26]. For this study, the PAQ-A was slightly modified to better reflect the types of activities common in Tirana, including the removal of questions about intensive sports training, which were not relevant to the majority of students. Responses to the relevant questions were rated on a scale from 1 (low activity) to 5 (high activity), and the average score across these questions was calculated to determine the overall level of physical activity. The Internet Addiction Test (IAT), developed by Young [27] is a widely used instrument to assess internet addiction. It includes 20 items that evaluate compulsive internet behavior, dependency, escapism, and neglect of personal responsibilities. Participants rated each item on a 5-point Likert scale (0 = Does not apply to me, 5 = Always applies to me). The total score ranges from 0 to 100, with classifications as follows: a) 0–30: Normal internet use; b) 31–49: Mild internet addiction; c) 50–79: Moderate internet addiction; d) 80–100: Severe internet addiction. The IAT also measures six psychosocial factors of internet addiction, including excessive use, neglect of work, impatience, lack of control, and neglect of social life, using relevant subscales.

2.3. Procedure

The data collection process began with obtaining permissions from the Tirana Regional Education Directorate and Tirana District Education Directorate. After securing the necessary approvals, participants were informed about the study's objectives, their voluntary participation, and the confidentiality of their responses. The survey was administered in schools, with each student completing the questionnaires independently. The researcher visited the selected schools according to a pre-determined schedule, ensuring that each session lasted approximately 10-15 minutes. Participants were provided clear instructions on how to fill out the questionnaires, and they were assured of the anonymity and confidentiality of their responses. At the start of each session, the researcher introduced the study, explaining the purpose and procedure for completing the questionnaires. The completed questionnaires were collected by the researcher, and participants were thanked for their cooperation.

2.4. Statistical Analysis

The collected data were analyzed using IBM SPSS version 26. Descriptive statistics were first computed to summarize the demographic characteristics of the participants, including group age, gender, and school district. Pearson Correlation statistical method were conducted to explore the correlation between physical activity levels and internet addiction, as well as the psychosocial factors associated with excessive screen time focusing on gender differences in urban and rural zone.

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3. Results

Graph 1, provides participants' demographics components reflecting the population ratio based on gender in urban and rural zone. The distribution of our participants are 26.8% female and 23.3% male from urban zone and 26.5% female and 23.4% male from rural zone of Tirana region. The female gender was those who dominated more in this study. Figure 1.

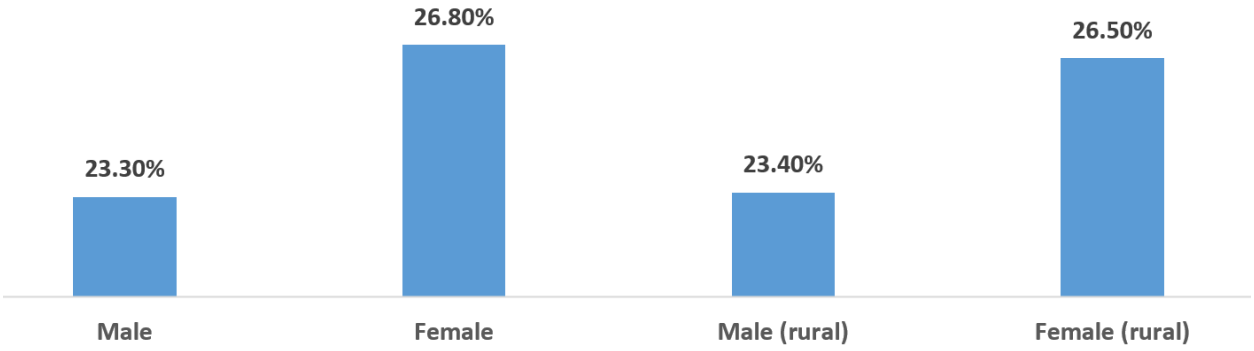

Figure 1.
The composition of our study participants.

In Table 1 are presented the results of the descriptive analyses showing that male adolescents engage in more Physical Activity compared to female adolescents, respectively 2.7±0.62 male (rural zone); 2.8±0.61 male (urban zone); and 2.5±0.59 female (rural zone); 2.6±0.57 female (urban zone).

Table 1.
The involvment level in Physical Activity by gender in urban and rural zone.

Gender		N	Minimum	Maximum	Sum	Mean		Std. Deviation
		Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
Male (urban)	Average of PA	472	1.22	4.61	1325.33	2.8079	0.02839	0.61668
	Valid N (listwise)	472						
Female (urban)	Average of PA	545	1.32	4.42	1435.84	2.6346	0.02477	0.57828
	Valid N (listwise)	545						
Male (rural)	Average of PA	475	1.06	4.51	1319.57	2.7780	0.02889	0.62957
	Valid N (listwise)	475						
Female (rural)	Average of PA	538	1.23	4.39	1386.21	2.5766	0.02546	0.59051
	Valid N (listwise)	538						

Table 2 shows that the weekend is the most suitable time for engaging in Physical Activity, as adolescents have school obligations during the weekdays. Referring scoring system ranging of PAQ, our results indicated that the average of the Physical Activity involvement level during the weekend is in a moderate level, respectively *Friday about 3.17±1.30, Saturday about 3.35±1.43 and Sunday about 3.23±1.49.*

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Table 2.
Physical Activity involvement level per day during the week for all the participants.

		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
N	Valid	2030	2030	2030	2030	2030	2030	2030
	Missing	0	0	0	0	0	0	0
Mean		2.55	2.66	2.66	2.85	3.17	3.35	3.23
Std. Deviation		1.232	1.246	1.280	1.296	1.306	1.431	1.499

Meanwhile, in the table 3 our results indicated that the predominant gender in Physical Activity participation is male adolescents from the entire Tirana region, with an equal average between urban and rural males.

Table 3.
Physical Activity involvement level per day during week based on gender in urban and rural zone.

Gender		N	Minimum	Maximum	Sum	Mean		Std. Deviation
		Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
Male (urban)	Average Day.Week	472	1.00	5.00	1440.00	3.0508	0.04239	0.92085
	Valid N (listwise)	472						
Female (urban)	Average Day.Week	545	1.00	5.00	1522.14	2.7929	0.03443	0.80377
	Valid N (listwise)	545						
Male (rural)	Average Day.Week	475	1.00	5.00	1445.57	3.0433	0.04266	0.92982
	Valid N (listwise)	475						
Female (rural)	Average Day.Week	538	1.00	5.00	1528.57	2.8412	0.03461	0.80282
	Valid N (listwise)	538						

In Table 4 there are results of the gender disparities regarding the internet browsing component showing that female gender *(urban female adolescents 48.9% and rural female adolescents 40%)* is more dominant than male gender. The prevalence of the female gender is also observed in the time range of *2 hours to 4 hours per day/week* (26.6%) (mainly among urban female adolescents). (Table 4)

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Table 4.
Descriptive analyses of time spending surfing the internet by adolescents in the Tirana region.

Gender		Frequency	Percent	Valid Percent	Cumulative Percent
Male (urban)	2 hour	181	38.3	38.3	38.3
	4 hour	107	22.7	22.7	61.0
	6 hour	80	16.9	16.9	78.0
	8 hour	36	7.6	7.6	85.6
	10 hour	68	14.4	14.4	100.0
	Total	472	100.0	100.0	
Female (urban)	2 hour	218	40.0	40.0	40.0
	4 hour	145	26.6	26.6	66.6
	6 hour	86	15.8	15.8	82.4
	8 hour	49	9.0	9.0	91.4
	10 hour	47	8.6	8.6	100.0
	Total	545	100.0	100.0	
Male (rural)	2 hour	175	36.8	36.8	36.8
	4 hour	93	19.6	19.6	56.4
	6 hour	77	16.2	16.2	72.6
	8 hour	39	8.2	8.2	80.8
	10 hour	91	19.2	19.2	100.0
	Total	475	100.0	100.0	
Female (rural)	2 hour	263	48.9	48.9	48.9
	4 hour	121	22.5	22.5	71.4
	6 hour	78	14.5	14.5	85.9
	8 hour	35	6.5	6.5	92.4
	10 hour	41	7.6	7.6	100.0
	Total	538	100.0	100.0	

The results of Pearson Correlation Statistical Analyze presented at Table 5 showed that referring to the male gender, it is observed that among male adolescents in the rural zone, there is a very strong correlation between the first factor (*Salience Traits*) and the second factor (*Excessive Use*), where r = 0.741 and the Sig. (2-tailed) level is .000, indicating that the correlation is positively significant. Similarly, there is a strong correlation with the fourth factor (*Impatience*), where r = 0.659 and the Sig. (2-tailed) level is .000, indicating a positive correlation, where changes in one variable correspond to changes in the other.

While at the Table 6 the results show that among male adolescents in urban zone, in addition to the two strong and positive correlations, a third strong correlation is observed between the second factor (*Excessive Use*) and the fifth factor (*Lack of Control*), where r = 0.631 and the Sig. (2-tailed) level is .000, indicating a positive correlation with statistical significance at the 0.01 level (Table 6).

Tables 7 and 8 present the results of the correlations between psychosocial factors and hours of Internet usage, comparing the urban and rural areas, it is evident that all coefficients are significant for both the rural and the urban at a 1% error level. Notably, the strongest correlations are observed between the second factor (*Excessive Use*) and *hours of Internet browsing* for the entire Tirana region, respectively r = 0.449 in urban zone and r = 0.441 in rural zone.

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Table 5.
The correlation between "Psychosocial Factors" and "Gender" in rural zone of Tirana.

Gender			Salient traits	Excessive use	Neglect of work	Impatient expectations	Lack of control	Neglect of social life
Male (rural)	Salient traits	Pearson Correlation	1	0.741**	0.613**	0.659**	0.592**	0.422**
		Sig. (2-tailed)		0	0	0	0	0
		N	475	475	475	475	475	475
	Excessive use	Pearson Correlation	0.741**	1	0.607**	0.639**	0.616**	0.462**
		Sig. (2-tailed)	0		0	0	0	0
		N	475	475	475	475	475	475
	Neglect of work	Pearson Correlation	0.613**	0.607**	1	0.574**	0.519**	0.253**
		Sig. (2-tailed)	0	0		0	0	0
		N	475	475	475	475	475	475
	Impatient expectations	Pearson Correlation	0.659**	0.639**	0.574**	1	0.531**	0.401**
		Sig. (2-tailed)	0	0	0		0	0
		N	475	475	475	475	475	475
	Lack of control	Pearson Correlation	0.592**	0.616**	0.519**	0.531**	1	0.335**
		Sig. (2-tailed)	0	0	0	0		0
		N	475	475	475	475	475	475
	Neglect of social life	Pearson Correlation	0.422**	0.462**	0.253**	0.401**	0.335**	1
		Sig. (2-tailed)	0	0	0	0	0	
		N	475	475	475	475	475	475
Female (rural)	Salient traits	Pearson Correlation	1	0.776**	0.603**	0.696**	0.677**	0.591**
		Sig. (2-tailed)		0	0	0	0	0
		N	538	538	538	538	538	538
	Excessive use	Pearson Correlation	0.776**	1	0.662**	0.717**	0.709**	0.565**
		Sig. (2-tailed)	0		0	0	0	0
		N	538	538	538	538	538	538
	Neglect of work	Pearson Correlation	0.603**	0.662**	1	0.591**	0.545**	0.479**
		Sig. (2-tailed)	0	0		0	0	0
		N	538	538	538	538	538	538
	Impatient expectations	Pearson Correlation	0.696**	0.717**	0.591**	1	0.616**	0.452**
		Sig. (2-tailed)	0	0	0		0	0
		N	538	538	538	538	538	538
	Lack of control	Pearson Correlation	0.677**	0.709**	0.545**	0.616**	1	0.400**
		Sig. (2-tailed)	0	0	0	0		0
		N	538	538	538	538	538	538
	Neglect of social life	Pearson Correlation	0.591**	0.565**	0.479**	0.452**	0.400**	1
		Sig. (2-tailed)	0	0	0	0	0	
		N	538	538	538	538	538	538

Note: ** Correlation is significant at the 0.01 level (2-tailed).

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Table 6.
The correlation between "Psychosocial Factors" and "Gender" in urban zone of Tirana.

Gender			Salient traits	Excessive use	Neglect of work	Impatient expectations	Lack of control	Neglect of social life
Male (urban)	Salient traits	Pearson Correlation	1	0.717**	0.572**	0.636**	0.629**	0.458**
		Sig. (2-tailed)		0	0	0	0	0
		N	472	472	472	472	472	472
	Excessive use	Pearson Correlation	0.717**	1	0.625**	0.622**	0.631**	0.489**
		Sig. (2-tailed)	0		0	0	0	0
		N	472	472	472	472	472	472
	Neglect of work	Pearson Correlation	0.572**	0.625**	1	0.528**	0.501**	0.331**
		Sig. (2-tailed)	0	0		0	0	0
		N	472	472	472	472	472	472
	Impatient expectations	Pearson Correlation	0.636**	0.622**	0.528**	1	0.527**	0.375**
		Sig. (2-tailed)	0	0	0		0	0
		N	472	472	472	472	472	472
	Lack of control	Pearson Correlation	0.629**	0.631**	0.501**	0.527**	1	0.347**
		Sig. (2-tailed)	0	0	0	0		0
		N	472	472	472	472	472	472
	Neglect of social life	Pearson Correlation	0.458**	0.489**	0.331**	0.375**	0.347**	1
		Sig. (2-tailed)	0	0	0	0	0	
		N	472	472	472	472	472	472
Female (urban)	Salient traits	Pearson Correlation	1	0.694**	0.510**	0.646**	0.522**	0.487**
		Sig. (2-tailed)		0	0	0	0	0
		N	545	545	545	545	545	545
	Excessive use	Pearson Correlation	0.694**	1	0.652**	0.693**	0.680**	0.460**
		Sig. (2-tailed)	0		0	0	0	0
		N	545	545	545	545	545	545
	Neglect of work	Pearson Correlation	0.510**	0.652**	1	0.543**	0.483**	0.363**
		Sig. (2-tailed)	0	0		0	0	0
		N	545	545	545	545	545	545
	Impatient expectations	Pearson Correlation	0.646**	0.693**	0.543**	1	0.578**	0.369**
		Sig. (2-tailed)	0	0	0		0	0
		N	545	545	545	545	545	545
	Lack of control	Pearson Correlation	0.522**	0.680**	0.483**	0.578**	1	0.280**
		Sig. (2-tailed)	0	0	0	0		0
		N	545	545	545	545	545	545
	Neglect of social life	Pearson Correlation	0.487**	0.460**	0.363**	0.369**	0.280**	1
		Sig. (2-tailed)	0	0	0	0	0	
		N	545	545	545	545	545	545

Note: ** Correlation is significant at the 0.01 level (2-tailed).

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Table 7.
The correlation between "Psychosocial Factors" and "Internet browsing time" in urban zone of Tirana.

Education			Salient traits	Excessive use	Neglect of work	Impatient expectations	Lack of control	Neglect of social life	Internet browsing time
Tirana (urban)	Salient traits	Pearson Correlation	1	0.705**	0.540**	0.640**	0.569**	0.465**	0.347**
		Sig. (2-tailed)		0	0	0	0	0	0
		N	1017	1017	1017	1017	1017	1017	1017
	Excessive use	Pearson Correlation	0.705**	1	0.642**	0.655**	0.648**	0.480**	0.449**
		Sig. (2-tailed)	0		0	0	0	0	0
		N	1017	1017	1017	1017	1017	1017	1017
	Neglect of work	Pearson Correlation	0.540**	0.642**	1	0.529**	0.477**	0.369**	0.276**
		Sig. (2-tailed)	0	0		0	0	0	0
		N	1017	1017	1017	1017	1017	1017	1017
	Impatient expectations	Pearson Correlation	0.640**	0.655**	0.529**	1	0.553**	0.361**	0.331**
		Sig. (2-tailed)	0	0	0		0	0	0
		N	1017	1017	1017	1017	1017	1017	1017
	Lack of control	Pearson Correlation	0.569**	0.648**	0.477**	0.553**	1	0.291**	0.336**
		Sig. (2-tailed)	0	0	0	0		0	0
		N	1017	1017	1017	1017	1017	1017	1017
	Neglect of social life	Pearson Correlation	0.465**	0.480**	0.369**	0.361**	0.291**	1	0.264**
		Sig. (2-tailed)	0	0	0	0	0		0
		N	1017	1017	1017	1017	1017	1017	1017
	Internet browsing time	Pearson Correlation	0.347**	0.449**	0.276**	0.331**	0.336**	0.264**	1
		Sig. (2-tailed)	0	0	0	0	0	0	
		N	1017	1017	1017	1017	1017	1017	1017

Note: ** Correlation is significant at the 0.01 level (2-tailed).

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Table 8.
The correlation between "Psychosocial Factors" and "Internet browsing time" in rural zone of Tirana.

Education			Salient traits	Excessive use	Neglect of work	Impatient expectations	Lack of control	Neglect of social life	Internet browsing time
Tirana (rural)	Salient traits	Pearson Correlation	1	0.761**	0.610**	0.683**	0.640**	0.518**	0.355**
		Sig. (2-tailed)		0	0	0	0	0	0
		N	1013	1013	1013	1013	1013	1013	1013
	Excessive use	Pearson Correlation	0.761**	1	0.646**	0.686**	0.663**	0.535**	0.441**
		Sig. (2-tailed)	0		0	0	0	0	0
		N	1013	1013	1013	1013	1013	1013	1013
	Neglect of work	Pearson Correlation	0.610**	0.646**	1	0.592**	0.531**	0.407**	0.380**
		Sig. (2-tailed)	0	0		0	0	0	0
		N	1013	1013	1013	1013	1013	1013	1013
	Impatient expectations	Pearson Correlation	0.683**	0.686**	0.592**	1	0.578**	0.447**	0.366**
		Sig. (2-tailed)	0	0	0		0	0	0
		N	1013	1013	1013	1013	1013	1013	1013
	Lack of control	Pearson Correlation	0.640**	0.663**	0.531**	0.578**	1	0.369**	0.312**
		Sig. (2-tailed)	0	0	0	0		0	0
		N	1013	1013	1013	1013	1013	1013	1013
	Neglect of social life	Pearson Correlation	0.518**	0.535**	0.407**	0.447**	0.369**	1	0.325**
		Sig. (2-tailed)	0	0	0	0	0		0
		N	1013	1013	1013	1013	1013	1013	1013
	Internet browsing time	Pearson Correlation	0.355**	0.441**	0.380**	0.366**	0.312**	0.325**	1
		Sig. (2-tailed)	0	0	0	0	0	0	
		N	1013	1013	1013	1013	1013	1013	1013

Note: ** Correlation is significant at the 0.01 level (2-tailed).

Additionally, a strong relationship is observed between the first factor (Salient Traits) and hours of Internet browsing among subjects in the urban area of Tirana, with r = 0.347 and a Sig. (2-tailed) level of .000, indicating a positive correlation with statistical significance at the 0.01 level. In contrast, for subjects in the rural area of Tirana, a strong relationship exists between the third factor (Neglect of Work/School Duties) and hours of Internet browsing, where r = 0.380 and the Sig. (2-tailed) level is .000, indicating a positive correlation with statistical significance at the 0.01 level. The weakest relationships at the regional level are observed between the fifth factor (Lack of Control) and hours of Internet browsing for the urban zone of Tirana (r = 0.264, Table 7), and the fourth factor (Impatience) and hours of Internet browsing for the rural zone of Tirana, where r = 0.312 and the Sig. (2-tailed) level is .000, indicating a positive correlation with statistical significance at the 0.01 level (Table 8).

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4. Discussion

The results from this study on adolescents in Tirana provide important insights into the physical activity patterns and internet use behaviors among urban and rural youth. A key finding from the descriptive analyses reveals that male adolescents, both in urban and rural areas, tend to engage in more physical activity compared to their female counterparts. This gender difference in physical activity aligns with broader trends observed globally, where males are typically more involved in physical exercise than females during adolescence [5]. Additionally, the study found that weekends are the most common time for adolescents to engage in physical activity, which is consistent with the demands of school schedules during weekdays. The moderate levels of physical activity during weekends reflect the challenges that adolescents face in balancing schoolwork and physical exercise. This echoes findings in other studies, which have shown that sedentary behavior, particularly from prolonged screen time, significantly reduces the opportunities and motivations for physical activity during weekdays [2]. In contrast, weekends provide more leisure time, potentially encouraging more physical engagement. Gender differences in internet usage were also observed, with female adolescents, particularly in urban areas, spending more time online. This aligns with previous studies indicating that girls often use the internet, particularly social media, for communication and relationship-building, while boys may use it for more general socialization [19]. Furthermore, the results showed that a significant portion of urban females, especially those in the age range of 2-4 hours of internet use per day, suggests that females are more likely to engage in prolonged screen time, potentially contributing to negative health outcomes associated with excessive digital media exposure. This finding is consistent with the results from the American Academy of Pediatrics, which recommends limiting screen time to promote better health outcomes in adolescents [3]. Pearson's correlation analyses provide more granular insights into the relationship between internet use and physical activity. Among rural male adolescents, a strong positive correlation was found between "Salience Traits" and "Excessive Use," suggesting that those who exhibit traits of internet addiction are more likely to engage in excessive screen time. This is consistent with other studies that have highlighted the strong link between excessive internet use and the development of addictive behaviors in adolescents [24].

Moreover, the correlations between "Excessive Use" and "Lack of Control" among urban male adolescents further emphasize the role of impulsivity and control issues in promoting excessive screen time. These findings are in line with research on internet addiction, which suggests that a lack of self-regulation and impulsivity often exacerbates internet overuse [6]. Another interesting finding from this study is the significant correlations between psychosocial factors and hours of internet use. Specifically, a strong relationship was found between "Excessive Use" and hours of internet browsing, both in urban and rural zones. This finding highlight how increasing internet use, especially in the context of adolescent development, is often accompanied by poorer psychological and social outcomes, such as increased stress or neglect of academic duties [20]. Furthermore, the relationship between "Salient Traits" and hours of internet use in urban areas ($r = 0.347$) indicates that adolescents with certain characteristics, such as a higher tendency toward internet addiction, are more likely to engage in prolonged internet use. Interestingly, the study also observed that for rural adolescents, the most substantial correlation between internet use and psychosocial factors was found with "Neglect of Work/School Duties," suggesting that prolonged screen time might interfere with academic responsibilities. This is consistent with the results of previous studies that found a direct link between excessive screen time and academic underperformance [18]. In comparison to other studies, the findings of this research corroborate the widespread concerns about sedentary behavior and its relationship with internet addiction in adolescence. Global data, including those from the American Academy of Pediatrics [3] indicate that only one-third of adolescents meet the recommended levels of physical activity [5]. This study confirms this trend, showing that the majority of adolescents in Tirana also fail to meet the recommended levels of activity, with physical inactivity being a major concern for their long-term health. Additionally, the gender differences observed in this study resonate with similar findings in other countries, where males tend to be more active than

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females, while females often engage more in sedentary behaviors such as social media use and online communication [19].

Overall, the findings of this study highlight the need for targeted interventions to promote physical activity and reduce sedentary behaviors among adolescents, particularly in urban settings like Tirana. Such interventions should consider the gender disparities in physical activity and internet usage patterns, as well as the role of psychosocial factors such as self-regulation and impulsivity. This research reinforces the importance of balancing digital engagement with physical activity, particularly as adolescence is a critical period for the development of lifelong health behaviors. Encouraging outdoor play, sports participation, and active social interactions, while limiting screen time, could provide effective strategies for improving adolescent health in the digital age.

5. Conclusions

The findings of this study indicate that adolescents in Tirana engage in a moderate level of physical activity, with males aged 12–15 exhibiting the highest levels of engagement, albeit still below thresholds associated with optimal health outcomes. Internet use among participants appears balanced, predominantly oriented toward social networking and information-seeking activities, and does not suggest patterns indicative of dependency, even among older male adolescents. These results are consistent with existing literature on the adverse effects of sedentary behavior and excessive screen time, while providing a localized lens that points to possible behavioral adaptations influenced by urban environmental dynamics.

The study contributes novel insights by examining gender and age-related disparities within an urban context in a developing country, highlighting the need for tailored interventions that address both physical inactivity and healthy technology use. Nevertheless, the study's generalizability is constrained by its reliance on self-reported data and its geographically limited sample. To overcome these limitations, it is recommended that schools and community institutions develop structured physical activity initiatives, promote digital literacy with an emphasis on time management, and adopt transdisciplinary research approaches. Furthermore, longitudinal studies are warranted to explore the evolving impact of digital technologies on adolescent health, particularly in the context of emerging developments in artificial intelligence.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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