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Impact of Screen Time on Adolescents' Physical Well-being: A Cross-Sectional Study on Health-Related Quality of Life in Iraq

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Abstract

Background: The increasing use of digital devices has raised concerns regarding their impact on adolescents' health. Excessive screen time has been linked to various physical and mental health risks, potentially affecting overall well-being. Understanding this association is critical for developing interventions to improve adolescent health outcomes.

Objectives: This study aims to examine the relationship between excessive screen time and the physical well-being domain of adolescents' health-related quality of life (HRQoL) and investigate demographic factors associated with physical well-being.

Methods: A descriptive cross-sectional study was conducted among 387 secondary school students (221 females, 228 males) in Al-Najaf Al-Ashraf, Iraq, between December 2023 and May 2024. Data were collected using a self-administered questionnaire incorporating demographic variables, the KINDL questionnaire (assessing HRQoL), and the Questionnaire for Screen Time of Adolescents (QueST). Statistical analyses, including Pearson correlation, t-tests, and ANOVA, were performed to explore associations between screen time and physical well-being.

Results: A statistically significant negative correlation ($p = 0.022$, $r = -0.102$) was observed between screen time and physical well-being, suggesting that higher screen exposure is associated with lower physical HRQoL. Over 55.6% of adolescents reported screen time exceeding 10 hours per day, with 16- to 18-year-olds showing the highest usage rates. Gender differences were significant ($p = 0.000$), with males reporting better physical well-being scores compared to females. However, parental employment and income levels showed no significant impact.

Conclusion: This study highlights the negative impact of excessive screen time on adolescents' physical well-being. The findings emphasize the urgent need for public health interventions to regulate screen use and promote healthier lifestyle habits among adolescents. Further longitudinal studies are recommended to explore causal mechanisms and develop targeted interventions.

What is already known about the topic?

- *With the widespread use of smartphones, computers, tablets, and gaming consoles, adolescents are spending more time in front of screens than ever before—both for educational and recreational purposes*

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Introduction

The rapid advancement of digital technology has led to an unprecedented increase in screen time among adolescents, raising significant concerns about its impact on their health and well-being. Screen-based activities, including social media use, online gaming, and digital learning, have become integral to teenagers' daily routines (Belton et al., 2021). However, excessive screen time has been linked to various health risks, particularly physical inactivity, sleep disturbances, obesity, and cardiovascular stress (Saquib, 2018; Wang et al., 2019). These concerns are further amplified by the COVID-19 pandemic, which has reinforced the reliance on screens for education, entertainment, and social interaction (Madigan et al., 2022).

Adolescence is a critical period of growth and development, making it essential to maintain optimal physical health to support overall well-being (Capio et al., 2014). One important measure of adolescent health is health-related quality of life (HRQoL), a multidimensional construct that reflects an individual's perceived physical, psychological, and social well-being (Wong et al., 2021). Studies indicate prolonged screen exposure may negatively influence HRQoL by contributing to sedentary behaviors, increased body fat percentage, and reduced physical fitness levels (Saunders & Vallance, 2016; Wu et al., 2023). Despite these concerns, there is limited research in Iraq examining the association between screen time and adolescents' physical well-being—an essential domain of HRQoL.

Given the increasing prevalence of screen use among adolescents, it is crucial to investigate the extent to which screen time impacts their physical health and identify potential demographic factors that may influence this relationship. This study aims to address this knowledge gap and contribute to evidence-based strategies for promoting healthier screen use among adolescents.

Aim of the Study

This study aims to examine the impact of screen time on the physical well-being domain of adolescents' health-related quality of life (HRQoL) in Iraq. Additionally, it seeks to explore the relationship between demographic characteristics (such as age, gender, parental occupation, and family income) and adolescents' physical well-being. By identifying key factors associated with reduced physical HRQoL, this research aims to

inform public health interventions that promote healthier screen habits and active lifestyles among adolescents.

Methods

Study Design and Participants

This study employed a descriptive cross-sectional design to examine the relationship between screen time and the physical well-being domain of adolescents' health-related quality of life (HRQoL). The study was conducted in various secondary schools in Al-Najaf Al-Ashraf, Iraq, between December 24, 2023, and May 25, 2024. Participants were selected using a convenience sampling technique.

Inclusion and Exclusion Criteria

Inclusion criteria:

- Secondary school students (both genders).
- No chronic illnesses (e.g., cancer, hypertension, diabetes).
- Parental consent for participation.

Exclusion criteria:

- Incomplete questionnaire responses.
- Presence of a diagnosed medical condition affecting physical health.

Data Collection Instruments

A three-part structured questionnaire was used to collect data:

1. Demographic Information: Age, gender, grade level, parental occupation, and family income.
2. Screen Time Assessment: The Questionnaire for Screen Time of Adolescents (QueST) (Knebel et al., 2022), which evaluates screen-related activities such as studying, video watching, gaming, social media use, and work-related screen exposure.
3. Health-Related Quality of Life (HRQoL) Measurement: The KINDL questionnaire (Ravens-Sieberer et al., 2008), which includes six domains: physical well-being, emotional well-being, self-esteem, family relationships, friendships, and daily functioning.

- The physical well-being domain consists of four items:
    - I felt ill.
    - I was in pain.

    - I was tired and worn out.
    - I felt strong and full of energy.
- Each item was scored on a 5-point Likert scale (1 = never, 5 = always).
- Scores were transformed to range from 0 to 100, with higher scores indicating better physical well-being.

The Arabic version of the KINDL questionnaire has demonstrated good construct validity and reliability (Cronbach's alpha = 0.70) (Essaddam et al., 2018).

Reliability and Validity

- A pilot study with 10 secondary school students assessed the reliability and validity of the instruments.
- The KINDL questionnaire showed strong internal consistency (Cronbach's alpha = 0.85).
- The Arabic translation of the QueST questionnaire underwent expert validation by ten university professors and was verified for reliability through a test-retest procedure (coefficient = 0.89).

Statistical Analysis

Data were analyzed using SPSS version 16.

- Descriptive statistics: Means, standard deviations, frequencies, and percentages.
- Correlation analysis: Pearson's correlation coefficient to assess associations between screen time and physical well-being.
- Comparative analysis:
    - Independent sample t-tests to compare physical well-being scores between male and female participants.
    - One-way ANOVA to examine differences in physical well-being across grade levels.
- A p-value < 0.05 was considered statistically significant.

Results

The study included a total of 387 secondary school students, with the majority (55.5%) falling within the 16–18 years age group, followed by those under 16 years (38.0%), and a smaller proportion (6.5%) aged over 18 years. In terms of gender distribution, 53.0% of participants were male, while 47.0% were female. Regarding educational levels, the third grade had the highest representation at 28.9%.

Parental employment data indicated that 59.9% of fathers were employed, whereas 76.7% of mothers were unemployed. The most commonly reported family monthly income ranged between 601,000 and 900,000 Iraqi dinars (24.5%).

Analysis of screen time patterns revealed that a majority (55.6%) of students reported using screens for more than 10 hours per day. The highest proportion of excessive screen time usage was observed among 16–18-year-old students.

In assessing the physical well-being domain of health-related quality of life (HRQoL), 50.9% of participants reported a moderate level of physical well-being, while 22.7% were classified as having low physical well-being, suggesting a subgroup with potential health risks. The Pearson correlation analysis indicated a statistically significant negative correlation ($r = -0.102$, $p = 0.022$) between screen time and physical well-being, suggesting that higher screen exposure is linked to lower physical HRQoL scores.

Further analysis of demographic factors and physical well-being revealed significant gender differences, with males demonstrating higher physical well-being scores (mean = 3.41) compared to females (mean = 2.84, $p = 0.000$). Additionally, first-grade students exhibited the highest physical well-being scores (mean = 3.41, $p = 0.000$), with a notable decline observed in higher grade levels. However, there was no significant association between parental employment and physical well-being (father: $p = 0.549$; mother: $p = 0.217$). Family income, on the other hand, showed a marginal trend ($p = 0.061$), suggesting that higher income levels may be associated with better physical well-being, though this relationship was not statistically definitive.

Summary of Key Findings

This study highlights that over half (55.6%) of the adolescents reported screen time exceeding 10 hours per day, with 16–18-year-olds displaying the highest screen usage. A significant negative correlation ($p = 0.022$, $r = -0.102$) was identified between screen time and physical well-being, indicating that increased screen use is associated with poorer physical health. Furthermore, males exhibited significantly higher physical well-being scores than females ($p = 0.000$). Additionally, physical well-being scores were highest among first-grade students, with a declining trend in higher grades. While parental employment status had no

significant impact, family income showed a marginal association with better physical well-being, though further research is needed to establish a definitive link. These findings underscore the importance of addressing excessive screen time among adolescents and suggest the need for public health interventions aimed at promoting balanced digital engagement and healthier lifestyle habits.

Table (1) Frequency distribution of participants according to their demographic data

Demographic variable	Categories of variable	N=387	%
Age (years)	<16	147	38
	16-18	215	55.5
	>18	25	6.5
Gender	Male	205	53
	female	182	47
Grade	First	9	2.3
	Second	41	10.7
	Third	112	28.9
	Fourth	60	15.5
	Fifth	119	3.7
	Sixty	46	11.9
Father's occupation	Employed	232	59.9
	Unemployed	155	40.1
Mother's occupation	Employed	90	23.3
	Unemployed	297	76.7
Family monthly income	<300000	50	12.9
	300000-600000	88	22.7
(Iraqi Dinar)	601000- 900000	95	24.5

	901000- 1200000	93	24
	>1200000	61	15.8

Table (2): Distribution of participants according to average daily screen usage

number of hours	n	%
< 6	42	10.9
6-10	130	33.6
>10	215	55.6

Table (3) Distribution of participants according to the level of Physical Wellbeing domain of Adolescents' quality of life

Domain	Level					
	Low		Moderate		High	
	n	%	n	%	n	%
physical Domain	88	22.7	197	50.9	102	26.4

Table (4) Correlation between the total score of Physical Wellbeing domain of Adolescents' quality of life with participants' daily screen time

Quality of life domains	Screen Time	
physical Domain	R	-0.102
	P. value	0.022*

*R: Pearson correlation coefficient. P.value: Significance level. **: P.value≤0.01, *: P.value≤0.05*

Table (5): Differences in the participants' general quality of life (Physical Domain) according to their demographic characteristics

Sociodemographic variables		N	QOL (Physical Domain)	
			M	T,F/ P. Value
Age (years)	<16	147	3.17	F
	16-18	215	3.10	0.922
	>18	25	3.36	0.399
Gender	Male	205	3.41	T
	female	182	2.84	6.444
				0.000
Grade	First	9	3.41	F
	Second	41	2.51	
	Third	112	3.36	6.736
	Fourth	60	3.34	
	Fifth	119	3.11	0.000
	sixty	46	2.94	
Father's occupation	Employed	232	3.08	T
	Unemployed	155	3.23	0.360
				0.549
Mother's occupation	Employed	90	3.03	T
	Unemployed	297	3.18	1.532
				0.217
Family monthly income	<300000	50	3.03	F
	300000-600000	88	3.22	
	601000- 900000	95	3.06	0.681
	901000- 1200000	93	3.16	.0606
	>1200000	61	3.23	

*T: Refers to t. test for independent samples test. F: Refers to the one-way variance test One Way Anova. *: P.value≤0.05*

Discussion

This study's findings indicate that most adolescents (55.6%) reported screen time exceeding 10 hours per day, a figure notably higher than previous international reports. For example, a study in Indonesia found that before the COVID-19 pandemic, 49.2% of adolescents reported more than 10 hours of daily screen time, a percentage that declined to 35.4% post-pandemic (Wiguna et al., 2024). Similarly, a large-scale study in Canada involving 51,922 students (grades 6–12) found an average daily screen use of 7.8 hours (Saunders & Vallance, 2016). These comparisons suggest that screen time among adolescents in Iraq is significantly higher, raising concerns about the potential long-term health consequences.

The rise in screen time during and after the COVID-19 pandemic has been well documented across multiple countries (Lua et al., 2023). Even before the pandemic, research highlighted a growing global trend of adolescents exceeding recommended screen time limits. Several factors contribute to prolonged screen use, including academic requirements, social media engagement, online gaming, and streaming services (Ali et al., 2023; Strasburger et al., 2010). These trends reinforce the need for targeted interventions to promote healthier digital habits among adolescents.

A key finding of this study was the statistically significant inverse correlation between screen time and the physical well-being domain of health-related quality of life (HRQoL) ($r = -0.102$, $p = 0.022$). This suggests that higher screen time is linked to poorer physical well-being. Our findings contrast with those of Twenge and Campbell (2018), who reported a negative association between screen time and both overall and psychosocial quality of life (QOL). However, they align with the research of Borras et al. (2011), which found that sedentary behaviors and screen exposure negatively impact physical and emotional well-being. Similarly, Motamed-Gorji et al. (2019) observed that higher physical well-being scores were associated with lower screen exposure, although the relationship was not statistically significant.

Excessive screen time is widely associated with reduced physical activity levels, leading to a sedentary lifestyle that can have long-term consequences on physical health, cardiovascular fitness, and musculoskeletal health (Stiglic & Viner, 2019). Multiple cross-sectional and longitudinal studies have examined the association

between screen time and physical health outcomes in children and adolescents, consistently showing that excessive screen exposure correlates with poorer health outcomes, regardless of diet, sleep quality, or exercise levels (Saunders & Vallance, 2016).

Given these findings, it is imperative for health professionals, educators, and policymakers to address the risks and benefits of digital screen use. Instead of merely focusing on screen time reduction, a more effective strategy may involve integrating structured screen use with physical activities, educational content, and social interactions. Encouraging developmentally appropriate, engaging, and movement-based screen activities may be more beneficial than strict screen time limitations alone.

Conclusions

This study highlights a concerning prevalence of excessive screen time among adolescents, with over half exceeding 10 hours per day. A statistically significant negative correlation was identified between screen time and physical well-being, suggesting that prolonged screen exposure is associated with diminished physical health-related quality of life (HRQoL). The findings emphasize the need for further research to explore the causal mechanisms underlying this relationship.

Future studies should employ longitudinal designs and more diverse, representative samples to validate these findings and guide the development of public health interventions that promote balanced screen time habits. Educational campaigns, parental guidance, and school-based programs should be implemented to encourage healthier digital behaviors while supporting adolescent well-being.

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Competing Interests

The authors declare that they have no conflicts of interest related to this study.

Abbreviations

- QueST – Questionnaire for Screen Time of Adolescents
- HRQoL – Health-Related Quality of Life
- BMI – Body Mass Index
- QOL – Quality of Life
- TV – Television
- SPSS – Statistical Package for Social Sciences

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Availability of Data and Materials

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Ethical Considerations

This study was approved by the Ethics Committee of the College of Nursing, University of Kerbala, on October 28, 2022, under approval number UOK.CON.23.013. Formal authorization to conduct the study was obtained from the Directorate General of Education in the Holy Al-Najaf Province.

All participating students and their parents or legal guardians provided written informed consent after being fully informed about the study objectives, data confidentiality, and their right to withdraw from participation at any time.

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