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Relationship between Smart Phone Addiction and Quality of Life among Adolescents

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Abstract: Background: The growing smartphone usage among adolescents has become a major concern due to potential adverse effects on their quality of life. **Purpose**: To assess the relationship between smartphone addiction and quality of life among adolescents. **Design**: A descriptive correlational design was utilized. **Setting**: The study was conducted in preparatory and secondary schools at Al Shohadaa urban and rural schools. Sampling: Multi-stage random sample of 400 adolescents were obtained from the previously mentioned settings. **Instruments**: Data were collected using two instruments: structured interview questionnaire to assess adolescents' characteristics and their smart phone addiction and world health organization's quality of life questionnaire brief to assess the relationship between smartphone addiction and quality of Life. **Results**: Older adolescents (15-≤ 18 years) reported higher levels of smartphone addiction compared to younger adolescents (12-< 15 years). Also, there was a strong negative significant correlation between adolescents' smartphone addiction and their quality of life. **Conclusion**: There was a strong negative significant correlation between adolescents' smart phone addiction rate and quality of life among studied adolescents. **Recommendations**: Ongoing educational programs about proper use of smartphone, smartphone addiction, and quality of life should be designed and implemented to all adolescents in schools.

***Key words**: Adolescents, Nursing role, Quality of Life, Smartphone addiction.*

Introduction:

Adolescence is a pivotal stage in life because of its critical linkage to the other stages. It is transition phase of life between childhood and adulthood from ages 10 to 19. It involves significant changes in physical, psychological, and social aspects. Also, it is crucially shape individuals' personality, intellectual, and social skills. During this phase, adolescents encounter various challenges and opportunities, both internal and external, which will

profoundly impact their growth and development (Duan et al., 2024).

The adolescence stage is considered as very vital because the child cross over into a life that will shoulder him with the responsibility of being recognized and accepted as a member who contributes positively in the development of society in all ramification. On the other hand, the adolescent may be confused as he tries to understand himself and assert his position in the society (Kathuri-Ogola & Kabaria-Muriithi, 2024).

In addition, this period provides opportunities to positively influence the future health of adolescents but also carry new risks as they are susceptible to changes which may put them at a higher risk for problematic mobile use than adults (Orben et al., 2024). Mobile use has spread widely around the world for its mobility, communicational facilities and other features that result from development in information technologies (Okmi et al., 2023).

Smartphones are now capable of fulfilling functions of both computers and conventional phones in a single smaller device. These small computer-like phones can do countless tasks through applications. In addition to making calls and sending text messages, they provide many functionalities such as instant access and sharing information, games, shopping, video chat, e-mail, music, taking pictures and providing electronic books (Mukadam & Hirikude, 2023).They also provide essential tools including Global Positioning System (GPS), translator, recorders, calculator, clock, radio, remote control of electrical appliances, torchlight, e-wallet, and even health trackers thus they are becoming an integral part of adolescents' daily lives (Ting & Chen, 2020).

Adolescents not only use it for communication, but also for learning purposes, such as group discussions via instant messaging applications, or just simple information search (Herath & Wanasinghe, 2024). As smartphones can be intensely used almost anywhere, this growing habit is now mentioned together with the concept of "smartphone addiction" or "problematic smartphone use" to describe the toxic relationships individuals have with smartphones as they distract adolescents from participating in the real world. (Cilligol Karabey et al., 2024)

Smartphone addiction is an emerging type of addiction in the digital era, characterized by smartphone dependence that negatively affects human health with a wide range of psychological and physical manifestations (Alwazzeh et al., 2024). Personal, social and environmental factors were contributing to smartphone addiction. Personal factors include mental health as depression and loneliness, boredom and academic stress. Social factors include social rejection and peer victimization. Environmental factors include parental phubbing and family dysfunction as childhood emotional neglect, childhood maltreatment, poor parent–child relationship and parental psychological control (Crowhurst & Hosseinzadeh, 2024).

This addiction isolates adolescents from social surroundings which interfere with quality of life, such as impacts on physical, psychological and mental health. Physical problems include: physical inactivity, poor sleep quality, and increased risk of obesity, as well as musculoskeletal issues such as shoulder and neck pain, eye strain, headaches, earaches, inability to focus and fatigue (Hanhan et al., 2024). Psychological and mental health problems such as shyness, low self-esteem, altered sexual behavior, loneliness, depression, social isolation, anxiety, stress, irritability and severe mood changes (Kaur, 2024). Moreover, smart phone addiction leads to the deterioration of social health including low self-esteem, social dependence, introversion, high level of shyness, low social skills, high sensation seeking, and decline in social involvement (Ousman & Nazir, 2023)

Nurses play a crucial role in preventing smart phone addiction among adolescents by educating them about healthy technology use, promoting alternative activities, and supporting mental wellbeing. They can also help to identify and address the signs of addiction early, guiding adolescents toward healthier habits. Also, nurses can contribute to the development and implementation of evidence-based prevention programs targeting smart phone addiction in adolescents. also, the nurse practitioner provides cognitive behavior therapy and other therapies that increase insight into a person's behavior for smart phone addiction, particularly social websites. They explore the motives of the problem or determine the underlying reason for adolescent addiction, Accordingly, the nurse will help high-risk adolescents to confront this phenomenon (Bernstein et al., 2022).

Significance of the Study

Improper use of smartphones is linked to smartphone addiction, which is a worldwide growing concern (Isrofin & Munawaroh, 2024). Smart Phone Addiction (SPA) affects anywhere from 9.3 percent to 48 percent of the world's population (Sarhan, 2024). While the vulnerability in children and adolescents for SPA is assumed to be higher than in adult as prevalence rates of smartphone addiction in children and adolescents vary widely from 5% to about 50% (Fischer - Grote et al., 2021).

Purpose of the study

The purpose of the current study was to assess the relationship between smart phone addiction and quality of life among adolescents.

Research Questions

1) What is the level of smart phone addiction among adolescents?
2) What is the quality of life of adolescents with smart phone addiction?
3) Is there a relationship between smart phone addiction and quality of life among adolescents?

Methods

Design:

A descriptive correlational research design was utilized to achieve the purpose of the study.

Research Settings:

One city was randomly selected (Al Shohadaa). This study was conducted in preparatory and secondary schools in Al Shohada urban and rural settings. Then, Al Shohadaa preparatory school and Sidi Shible high school were randomly selected from Al Shohada urban area. In Al Shohadaa area, one preparatory school (Dragil New preparatory school) and one secondary school (Martyr Osama Said Abo Zalam secondary school in Dragil) were selected.

Sampling:

A multi-stage random sample of 400 adolescents from preparatory (Al Shohadaa preparatory school and Dragil New preparatory school) and secondary schools (Sidi Shible high school and Martyr Osama Said Abo Zalam secondary school in Dragil) were selected from the previously mentioned settings according to the following criteria:

Inclusion criteria:

They should range from 12-18 years use smartphone with an active internet connection. Also, they should be free from any psychological/mental problems.

Instruments:

Two instruments were utilized for data collection:

Instrument one: A Structured Interviewing Questionnaire sheet:

Structured interview questionnaire was developed by the researcher after reviewing the related literature (Kosola et al., (2024), to assess characteristics of studied adolescents and their smartphone addiction. It was composed of two parts:

- **Part one**: characteristics of studied adolescents: It contains age, gender, grade of educational level and their residence.
- **Part Two**: Smartphone Addiction Scale-Short Version (SAS-SV):It was adopted from Kwon et al., (2013) to assess adolescents' Smart phone Addiction (SA). It is a 6-point Likert scale. It contains 10 items e.g. missing planned work due to smartphone use. It ranges from 1 "strongly disagree" to 6 "strongly agree". The lowest and highest scores are 10 and 60, respectively. The higher score (41-60) means severe level of smartphone addiction while lower score (10- 19) means mild level of smartphone addiction.

Instrument two: World Health Organization's Quality of Life Questionnaire Brief (WHOQoL-BREF):

It was adapted from The World Health Organization's Quality of Life group (1996) and modified by the researcher to be suitable for Adolescents' developmental stage. Also, unclear words were replaced with alternatives that would be easier to understand by students to assess the relationship between SA and quality of Life (QoL). WHOQoL-BREF contains 26 questions, the first two questions generally evaluate the quality of life and health conditions, respectively. It contains 7 items related to physical health, 6 items related to mental health,

social health, 3 items related to social health and 8 items related to environmental health.

Scoring system for WHOQoL-BREF:

Scoring system for each item ranges from 1 "never" to 5 "always". Total scoring system was (26-42) for low quality of life, (43- 85) for moderate quality of life and (86- 130) for high quality of life. Possible scores ranged from 26 to 130 for each adolescent, with higher scores showing a better quality of life.

Reliability of Instruments:

Cronbach alpha was utilized to check instrument's reliability, which was 0.82 for instrument one and 0.84 for instrument two that indicated high reliability of the instruments.

Validity of Instruments:

Instruments were submitted to a jury of five specialists (three professors and two assistant professors in Pediatric nursing). All required modifications were done.

Ethical considerations:

- Ethical approval was obtained from the ethical and research committee of the Faculty of Nursing, Menoufia University.
- All participants were informed about the purpose, procedure and benefits of the study. The researcher explained that participation in the study was voluntary, and they could withdraw from the study at any time without penalty.
- Confidentiality and anonymity of information was assured through coding all data and putting all paper in a closed cabinet.
- Informed consent was obtained from adolescents to participate in the study.

Pilot study:

Prior to actual study, a pilot study was conducted on 10 % (40) of the sample from different schools to assess the constructed instruments for feasibility, clarity and their applicability. The necessary modification was carried out before conducting the main study. The pilot study revealed that the average length of time needed to complete the instruments was 20 – 30 min with each adolescent.

Adolescents who participated in the pilot study were excluded from the main study sample

Procedure:

1) Written permission

- An official permission for conducting the present study was obtained from the Faculty of Nursing, Menoufia University to the education administration in Al Shohadaa city to obtain the agreement of the educational sector to conduct the study.
- The researcher met the director of education department in Al Shohadaa city, the purpose of the study was explained and the agreement for conducting the study was obtained.
- The director of education department sent letters to the manager of selected schools to facilitate the task of data collection.

- The researcher met the school manager; the purpose of the study was explained and the agreement for conducting the study was obtained.

2) Researcher preparation

A review of past and current literature including books and articles was done to develop data collection instruments before conducting the study. This review helped the researcher to be acquainted with the actual dimensions and magnitude of the problem.

3) Data collection

- The researcher collected data from each school. By visiting the preparatory and secondary schools from 8:30 AM to 1:00 PM four days per week (Sunday, Monday, Tuesday, and Wednesday) for two months from the beginning of April to the end of May 2023. Each school took about two weeks.
- The researcher met the classroom teacher to gain his cooperation. The purpose of the study was explained.
- At the start of the interview, the researcher introduced herself to the students. The researcher explained the purpose of the study and obtaining written consent from each student to participate in the study. The researcher did a survey for all students in the class to select adolescents who using smartphones with active internet connection and exclude adolescents with psychological/mental problems.
- After selecting the students who met the inclusion criteria, the researcher interviewed adolescents from each grade individually during free time in the class in the waiting area. She introduced herself to the students, purpose and importance of the study were explained.
- The researcher collected data by distributing structured questionnaire (instrument one) to each student, mainly during the break time and free time in the class, each question was explained to adolescents to clear any vague question and allowed them to answer the questionnaire. The average length of time needed to complete this instrument was 10 – 15 min to assess the severity of smart phone addiction among students using Smartphone Addiction Scale-Short Version (SAS-SV).
- Also, selected adolescents were evaluated for their quality of life using World Health Organization's Quality of Life Questionnaire Brief (WHOQoL-BREF) (instrument two). The average length of time needed to complete this instrument was 10 – 15 min.

Statistical Analysis:

Data was coded, entered and analyzed by using SPSS (Statistical Package for Social Science) statistical package version 22. Graphics were done using Excel program. Quantitative data were presented by mean (X) and standard deviation (SD). It was analyzed using independent t test for comparison between total mean score of SA, as well as for comparison between total mean score of QoL two means. Qualitative data were presented in the form of frequency distribution tables, number and percentage. It was analyzed by chi-square ($\chi 2$) test. However, if an expected value of any cell in the table

was less than 5, Fisher Exact test was used (if the table was 4 cells), or Likelihood Ratio (LR) test (if the table was more than 4 cells). Level of significance was set as P value <0.05 for all significant test.

Results

Table (1): It is observed that more than half of studied adolescents (58.8%) aged between 15 to ≤ 18 years in urban area compared to 43.5% of studied adolescents in rural area with mean age 15.8± 3.5 Y in urban area compared to 14.7± 2.3 Y years in rural area. Also, more than half of studied adolescents were female in urban and rural area. According to their educational grades, 26.2% of studied adolescents in rural area at 3rd preparatory school compared to 14.8% of studied adolescents in urban area. **Table (2)**: This table reveals that more than half (57.1%) of studied adolescents in urban area suffered from severe smartphone addiction compared to less than half (45.2%) in rural area. Also, total mean score of smartphone addiction among studied adolescents living in urban areas was 40.8 ± 5.6, and total mean score of smartphone addiction among studied adolescents living in rural areas was 37.9 ± 6.3. So, there were statistically significant differences between adolescents total score of Smartphone addiction among urban and rural areas at P < 0.02.

Table (3): It is shown that more than one third (35%) of studied adolescents had good quality of life in relation to general domain, while 35.8% were good satisfied with their health after excessive use of smart phone. In addition, the total mean score of general domain among studied adolescents was 6.8 ±2.1.

Table (4): This table reveals that more than one third (31.3%) of the studied adolescents were neither poor nor good in relation to feeling physical pain preventing them from doing the work while 43.2% were very good in relation to the need for medical treatment to relieve the pain resulting from excessive use of the smart phone. Also, more than one quarter (25.3%) of them had poor energy for everyday life while 34.4% were very poorly satisfied with their sleep. In addition to, 39% of them had poor ability to perform daily living activities while 34 % were poorly satisfied with their capacity for work. However, the total mean score of physical domain among studied adolescents was 20.0 ± 4.5.

Table (5): This table reflects that more than one third (34.8%) of studied adolescents were neither poor nor good enjoying life with frequent use of the smart phone while 34.8% were very poor in relation to feeling meaningful life without smartphone. Also, 28%of them had poor ability to concentrate without constantly monitoring smartphone while 41.5% were very good in relation to acceptance of the body appearance. In addition to, more than one third (31.5%) of them were poorly satisfied with themselves, with excessive attachment to the smart phone while 24% were poor in relation to having negative feelings such as blue mood, despair, anxiety, depression as a result of excessive smartphone use. However, the total mean score of

mental domain among studied adolescents was 17.5 ± 3.5.

Table (6): It is shown that more than one third (35.4%) of studied adolescents were neither poor nor good satisfied with their personal relationships with frequent use of smart phone. In addition, more than one third of them (32.4%) were good satisfied with support getting from friends while attachment to the smart phone. Also, the total mean score of social QoL was 10.6 ±5.3 among studied adolescents.

Table (7): This table reveals that near one third (29%) of studied adolescents were very poor in relation to feeling safe without having smartphone while 30.8% were poor in relation to having healthy physical environment without the need to use smartphone. Also, more than one third (34.3%) of studied adolescents were neither poor nor good have enough money to meet their smartphone needs while 47.6% were very poor in relation to availability of information that needed in day-to-day life without using smart phone. Moreover, 30.8% of them were very poorly having opportunity for leisure activities without constantly checking smartphone and 30.2% were neither poor nor good satisfied with conditions of living place (Wi-Fi). However, more than one third (31.5%) of them were neither poor nor good satisfied with access to health services without the use of a smart phone while 31% were very poorly satisfied with mode of transportation. In addition, the total mean score of environmental domain among studied adolescents was 20.0 ± 5.5. Also, the mean grand total QoL score was 75.1 ± 11.0. Table (8): This table reflects that There was a strong negative significant correlation between total smartphone addiction score, and Overall total QoL score (r= -0.307, p<0.0001). As well as grand total quality of life dimensions r = -0.313, p <0.0001.

Table (1): Distribution of the Studied Adolescents According to their Characteristics (N = 400)

Items	Rural		Urban		X^2/ LR
	N	%	N	%	
Age (Years) 12 - <15 Years 15 – ≤ 18 Years	130 100	56.5 43.5	70 100	41.2 58.8	X^2 =9.2, P<0.002
Mean ± SD	14.7± 2.3 Y		15.8± 3.5 Y		t= 1.99, p<0.05
Gender: Male Female	 113 117	 49.1 50.9	 83 87	 48.8 51.2	X^2=0.004, p=0.95
Educational Grades: First Preparatory 2nd Preparatory 3rd Preparatory 1st 2ry school 2nd 2ry school 3rd 2ry school	 35 35 60 35 35 30	 15.2 15.2 26.2 15.2 15.2 13.0	 30 30 25 30 30 25	 17.6 17.6 14.8 17.6 17.6 14.8	X^2 =35.7, P<0.0001
Total	**230**	**100**	**170**	**100**	

Table (2): Distribution of Studied Adolescents' Smartphone Addiction Levels among Rural and Urban Areas.

Smartphone Addiction levels	Residence				X^2	P value
	Rural		Urban			
	N0.	%	N0.	%		
1) Mild Smartphone Addiction (10 – 19)	45	19.6	3	1.7	=29.5	<0.0001 HS
2) Moderate Smartphone Addiction (20 – 40)	81	35.2	70	41.2		
3) Severe Smartphone Addiction (41 – 60)	104	45.2	97	57.1		
Total mean± SD score of smartphone addiction	37.9 ± 6.3 (range= 11 – 58)		40.8 ± 5.6 (range= 12 – 60)		t=2.3	<0.02 sig.
Total	**230**	**100**	**170**	**100**		

Table (3): - Quality of Life among Adolescents with Smartphone Addiction According to General Domain Items

General Domain Items	Very poor (1)		Poor (2)		Neither poor nor good (3)		Good (4)		Very good (5)	
	N	%	N	%	N	%	N	%	N	%
How would you rate the effect of your frequent smartphone use on your quality of life?	47	11.8	26	6.5	117	29.3	140	35.0	70	17.5
How satisfied are you with your health considering the effects of excessive smart phone?	37	9.3	60	15.0	93	23.3	143	35.8	67	16.8
Total Mean Score of General Domain	**68. ±2.1 (range= 2 – 10)**									

Table (4): Quality of Life among Adolescents with Smartphone Addiction According to Physical Domain Items

Physical Domain Items	Very poor (1)		Poor (2)		Neither poor nor good (3)		Good (4)		Very good (5)	
	N	%	N	%	N	%	N	%	N	%
To what extent do you feel that the physical pain (caused by your frequent use of the smartphone) prevents you from doing the work you need to do?	25	6.3	52	13.0	125	31.3	122	30.5	76	19,0
How much do you need any medical treatment, to relieve the pain resulting from excessive use of the smart phone, to function in your life?	45	11.3	46	11.4	77	17.5	66	16.5	166	43.2
Do you have enough energy for everyday life with the availability and frequent use of the smart phone?	54	13.5	101	25.3	121	30.3	93	23.3	31	7.8
How well are you able to get around without having to constantly check your smart phone?	87	21.8	104	26.0	109	27.2	64	16.0	36	9.0
How satisfied are you with your sleep, with your frequent use of the smart phone?	137	34.3	99	24.8	106	26.5	32	8.0	26	6.5
How satisfied are you with your ability to perform your daily living activities affected by your attachment and use of the smart phone?	40	10.0	156	39.0	150	37.5	54	13.5	0	0.0
How satisfied are you with your capacity for work, with your constant checking of your smartphone?	74	18.5	136	34.0	104	26.0	64	16.0	22	5.5
Total Mean Score of Physical Domain	**20.0 ± 4.5 (range= 10 – 32)**									

Table (5): Quality of Life among Adolescents with Smartphone Addiction According to Mental Domain Items

Mental Domain Items	Very poor (1)		Poor (2)		Neither poor nor good (3)		Good (4)		Very good (5)	
	N	%	N	%	N	%	N	%	N	%
How much do you enjoy life with your frequent use of the smart phone?	36	9	119	29.8	139	34.8	66	16.5	40	10
To what extent do you feel your life to be meaningful without a smartphone?	139	34.8	114	28.4	83	20.8	40	10	24	6
How well are you able to concentrate without constantly monitoring your smartphone?	46	11.5	112	28	166	41.5	54	13.5	22	5.5
Are you able to accept your bodily appearance?	3	8	14	3.5	61	15.3	156	39	166	41.5
How satisfied are you with yourself, with your excessive attachment to the smart phone?	102	25.5	126	31.5	99	24.8	28	7	45	11.3
How often do you have negative feelings such as blue mood, despair, anxiety, depression as a result of excessive smartphone use?	39	9.8	96	24	138	34.5	84	21	43	10.8
Total Mean Score of Mental Domain	**17.5 ± 3.5 (range= 10- 28)**									

Table (6): Quality of Life among Adolescents with Smartphone Addiction According to Social Domain Items

Social Domain Items	Very poor (1)		Poor (2)		Neither poor nor good (3)		Good (4)		Very good (5)	
	N	%	N	%	N	%	N	%	N	%
How satisfied are you with your personal relationships with your frequent use of the smart phone?	48	12.0	51	12.8	142	35.4	108	27.0	51	12.9
How satisfied are you with your sex life?	46	11.5	21	5.3	99	24.6	142	35.5	92	23.2
How satisfied are you with the support you get from your friends while your attachment to the smart phone?	43	10.8	40	10.0	84	21.0	130	32.4	103	25.9
Total Mean Score of Social Domain	**10.6 ±5.3 (range= 3 – 64)**									

Table (7): Quality of Life among Adolescents with Smartphone Addiction According to Environmental Domain Items

Environmental Domain Items	Very poor (1)		Poor (2)		Neither poor nor good (3)		Good (4)		Very good (5)	
	N	%	N	%	N	%	N	%	N	%
How safe do you feel in your daily life without having your smartphone with you?	116	29.0	109	27.3	80	20.0	60	15.0	35	8.7
How healthy is your physical environment without the need to use a smartphone?	94	23.5	123	30.8	101	25.2	52	13.0	30	7.5
Have you enough money to meet your smartphone needs?	87	21.8	81	20.2	137	34.3	57	14.3	38	9.4
How available to you is the information that you need in your day-to-day life without using a smart phone?	190	47.6	79	19.8	65	16.0	55	13.8	11	2.8
To what extent do you have the opportunity for leisure activities without having to constantly check your smartphone?	123	30.8	100	25.0	77	19.2	56	14.0	44	11.0
How satisfied are you with the conditions of your living place (Wi-Fi)?	71	17.8	50	12.5	121	30.2	84	21.0	74	18.5
How satisfied are you with your access to health services without the use of a smart phone?	103	25.8	88	22.0	126	31.5	67	16.8	16	4.0
How satisfied are you with your mode of transportation?	124	31.0	103	25.8	100	25.0	49	12.3	24	6.0
Total Mean Score of Environmental Domain	**20.0 ± 5.5 (range= 8 – 36)**									
Grand total QoL	**75.1 ± 11.0 (range: 42 – 123)**									

Table (8): Correlation of Total Smartphone Addiction Scores among Studied Adolescents, with their Quality of Life Dimensions, as well as Grand Total Quality of Life Dimensions Scores (N=400)

Independent variable	General		Physical H		Mental H		Social H		Environmental Health		Overall QoL (26 items)		Grand total QoL dimensions (24 items)	
Total 'Smartphone Addiction scores	R	P	R	P	r	P	r	p	r	P	r	p	r	p
	-. 06	0.2	0.513	<0.0001	-0.147	<0.003	0.174	<0.0001	-0.244	<0.0001	- 0.307	<0.0001	- 0.313	<0.0001

Discussion: -

Smartphones are becoming more and more appealing for adolescents due to rapid development of mobile technologies. The smartphones in contrast to traditional cellphones, are able to process and store larger amounts of data. They offer a wide range of capabilities like gaming, internet browsing, and social networking in addition to their prime function of communication (Ahmad et al., 2024). However, the widespread use of smartphones in adolescents' daily life, affects their quality of life. Improper and irresponsible smartphone use can harm their social lives, their physical, mental and psychological functions. In addition, the repetitive use may lead to addiction (Girela Serrano et al., 2024). Accordingly, the current study aims to assess the relationship between smartphone addiction and quality of life among adolescents. According to characteristics of the studied adolescents, the current study revealed that older adolescents reported higher level of smartphone addiction compared to younger adolescents. In addition, females reported higher level of smartphone addiction compared to males. From researcher's point of view, this association may be because older adolescents have more freedom and autonomy, which might lead to less parental oversight and greater access to smartphones and increasing the risk of smartphone addiction. Moreover, females tend to be more interested with social media

Concerning distribution of studied adolescents' according to their Smartphone addiction among rural and urban residences, the current study showed that the largest percentage of studied adolescents in urban areas had severe smartphone addiction compared to adolescents in rural areas. From the researcher's point of view, it may be due to adolescents in urban areas generally have better access to the advanced technology and high-speed internet. Also, adolescents in urban areas are more likely to be influenced by their peers and social media trends which can increase their smartphone usage. In addition, urban environments can be more stressful due to traffic, noise, and a fast-paced lifestyle so adolescents may use smartphones as a coping mechanism to manage this stress.

This finding was supported by Ladani et al., (2025) who conducted a study about "Exploring smartphone utilization patterns, addiction, and associated factors in school-going adolescents". They revealed that urban adolescents are more prone to have severe smartphone addiction than those in rural areas due to differences in lifestyle and access to technology. Also, adolescents live in urban environment often have greater exposure to smartphones, faster internet connectivity, and more opportunities for online activities like gaming and social media. In contrast, adolescents who live in rural area may have limited access to these resources, which reduces their likelihood of developing severe smartphone addiction. Moreover, this finding was consistent with a study conducted by de Freitas et al. (2024) about "Self-

reported smartphone addiction among Brazilian adolescents in the COVID-19 pandemic context". They reported that urban adolescents had better access to smartphones and internet connectivity, contributing to higher addiction rate.

On the other hand, the finding was in disagreement with Cheng et al., (2024) who conducted a study about " Mobile phone addiction and suicide behaviors among Chinese adolescents: The mediation of poor sleep quality ". They clarified that rural adolescents have a higher prevalence of smartphone addiction than urban adolescents. Also, the current result was inconsistent with a study conducted by Li & Ren, (2024) about "Mobile phone addiction among left-behind children in Rural China". They mentioned that rural adolescents have a higher smartphone addiction percentage than urban adolescents. From the researcher point of view, it may be due to rural areas often have fewer social and recreational opportunities, causing adolescents to turn to their smartphones for interaction and entertainment.

Concerning physical domain, the current study found that more than one third of the studied adolescents were neither poor nor good in relation to feeling physical pain preventing them from doing the work, while less than half were very good in relation to the need for medical treatment to relieve the pain resulting from excessive use of the smart phone. In addition, more than one quarter of them had poor energy for everyday life and more than one third of them had poor ability to perform daily living activities. Also, more than one third was very poorly satisfied with their sleep. From researcher's point of view, it can be interpreted as excessive use of smartphones may lead to physical pain, impacting overall energy levels and physical fitness required for daily activities so medical attention is necessary. Also, notifications, habitual checking of smartphones and blue light exposure during the night can disrupt sleep cycles, leading to poorer sleep satisfaction.

These results supported by Anwar et al., (2021) who conducted a study about "Impact of smartphones on physical and psychosocial well-being of children and adolescent". They documented that physical challenges as postural defects, musculoskeletal pain, reduced energy, difficulty performing daily activities and dissatisfaction with sleep linked to excessive smartphone use among adolescents. In addition, this result agreed with Wacks & Weinstein, (2021) who conducted a study about "Excessive smartphone use is associated with health problems in adolescents and young adults". They found that excessive smartphone use negatively impacts physical well-being causing musculoskeletal pain, sleep disturbances, reduced physical fitness, and unhealthy habits.

Also, this result was consistent with a study entitled "The impact of smartphone use duration and posture on the prevalence of musculoskeletal discomfort in adolescents" conducted by Yang et al. (2024). They found that increased smartphone use duration and poor posture were associated with musculoskeletal discomfort in adolescents. However, the finding of the current study was inconsistent with

Izquierdo-Condoy et al., (2024) who conducted a study about "Exploring Smartphone Use and Its Applicability in Academic Training of Medical Students in Latin America". They showed that medical students frequently use smartphones for academic purposes and reported better daily functioning. Also, this result contraindicated with a study entitled "Smartphone overuse and distraction: which relationship with general well-being across different generations?" conducted by Bellini et al., (2025). They found that using smartphones for multitasking can improve job performance and physical health, showing that smartphones can have positive effects on certain aspects of daily life.

Regarding mental domain, the current study found that more than one third of the studied adolescents were neither poor nor good to enjoy life with frequent use of the smart phone. From researcher's point of view, this can be rationalized as frequent smartphone use may become a habitual part of some adolescents' daily routine. So, they might not perceive it as particularly good or bad but rather as a neutral tool that they use out of habit rather than enjoyment. This result agreed with Kosola et al., (2024) who conducted a study entitled "Smartphone Use and Well-Being of Adolescent Girls: A Population-Based Study". They found that while some adolescents reported positive effect of smartphone use on their well-being, others experienced negative effects, leading to a mixed overall impact.

Also, the result was in agreement with Marciano et al., (2022) who conducted a study about "Dynamics of Adolescents' Smartphone Use and Well-Being". They revealed that the relationship between smartphone use and well-being is complex and varies among individuals. Although, the finding of current study contraindicated with Yang et al., (2024). They found that increased smartphone duration use and poor posture were associated with musculoskeletal discomfort, but did not significantly hinder overall well-being.

In addition, the current study revealed that one third of studied adolescents were very poor in relation to feeling meaningful life without smartphone. While less than half were very good in relation to acceptance of the body appearance. In addition, more than one third of them were poorly satisfied with themselves, with excessive attachment to the smart phone while less than one third was poor in relation to having negative feelings such as blue mood, despair, anxiety, depression as a result of excessive smartphone use. From the researcher point of view, this could be due to adolescents' dependence on smartphones that make it difficult for them to find meaning to their life without it. Also, social media platforms often emphasize idealized body images and lifestyles, which can impact adolescents' self-perception. So, the need to stay connected can lead to poor satisfaction with life and negative feelings.

This result was consistent with Yogesh, et al., (2024) who conducted a study entitled "Associations between smartphone addiction, parenting styles,

and mental well-being among adolescents aged 15–19 years in Gujarat, India". They found that smartphone addiction was prevalent among adolescents and was significantly associated with poorer mental well-being, including feelings of stress, anxiety, and depression. They also noted that excessive smartphone use was linked to poor satisfaction with life and negative feelings such as despair and anxiety.

However, the finding of the current study was inconsistent with Kadirvelu et al., (2025) who conducted a study about "Digital Phenotyping for Adolescent Mental Health: A Feasibility Study Employing Machine Learning to Predict Mental Health Risk From Active and Passive Smartphone Data". They reported that the use of smartphone data predict mental health risks but did not find a direct association between smartphone addiction and mental health issues. It could be due to individual differences that can play a significant role in how smartphone addiction impacts mental health, leading to varied results across different studies.

Concerning social domain, the current study revealed that more than one third of studied adolescents were neither poor nor good satisfied with their personal relationships with frequent use of smart. In addition, more than one third of them were good satisfied with support getting from friends while attachment to the smart phone. From researcher's point of view, it can be interpreted as adolescents who frequently use smartphones may feel less satisfied with personal relationships due to reduced face-to-face interactions but they tend to feel more supported by friends because digital platforms make staying connected easier.

This result supported by Mohta & Halder, (2021) who conducted a study about "A comparative study on cognitive, emotional, and social functioning in adolescents with and without smartphone addiction". They documented that excessive smartphone use can weaken face-to-face connections, leaving adolescents feeling unsure about their personal relationships, while digital interactions provide good support from friends. In addition, this result agreed with Huang et al., (2022) who conducted a study about "Beyond screen time: Exploring the associations between types of smartphone use content and adolescents' social relationships". They found that the type of smartphone content influences adolescents' satisfaction with their personal relationships. In addition, social networking through smartphones boosts peer support.

Regarding Environmental domain, the current study found that near one third of studied adolescents were very poor in relation to feeling safe without having smartphone. In addition, more than one third was poor in relation to having healthy physical environment without the need to use smartphone. While, more than one third of studied adolescents were neither poor nor good have enough money to meet their smartphone needs. Moreover, near half were very poor in relation to availability of information that needed

in day-to-day life without using smart phone. From researcher's point view, it can be interpreted as adolescents are deeply dependent on smartphones for their sense of safety, accessing daily necessities, and finding essential information. Without this access, adolescents might feel isolated, unsafe and lack the necessary information to navigate their daily lives.

This result was supported by Rockey, & Eastman, (2023) who studied "Reducing Access Barriers: Exploring Student Smartphone Use across Higher Education Institutions". They highlight the importance of smartphones for accessing information and overcoming barriers in education. So, adolescents feel very poor in safety, physical environment, and access to daily information without smartphones. Additionally, this result came in the same line with Chan et al., (2023) who conducted a study about "Types of Smartphone Usage and Problematic Smartphone Use Among Adolescents". They illustrated that adolescents rely heavily on smartphones for social interactions, entertainment, and educational purposes, resulting feeling unsafe, lacking a healthy environment, and struggling with access to information without smartphones.

Concerning the correlation between adolescents' SA & QOL, the current study illustrated that there was a strong negative correlation between adolescents' SA and QOL among studied adolescents. From researcher's point of view, this may likely due to the harmful effects of excessive smartphone use. Addiction can lead to poor sleep, reduced physical activity, social isolation, and increased stress, all of these negatively impact QoL. Adolescents who are overly dependent on smartphones may struggle to maintain a healthy balance in their daily lives, affecting their physical, emotional, and social well-being.

This finding was consistent with Kabadayi, (2024) who found that higher levels of smartphone addiction were associated with lower QoL among adolescents as smartphone addiction was linked to negative outcomes such as depression, distress, loneliness, and sleep deprivation, all of them contribute to a lower QoL. Additionally, these findings were supported by Buctot et al., (2020) who studied "Factors associated with smartphone addiction prevalence and its predictive capacity for health-related quality of life among Filipino adolescents". They found significant negative correlations between smartphone addiction and various domains of QoL, including physical well-being, psychological well-being, and school environment indicating that when smartphone addiction increases, the overall QoL decreases. Finally, it can be concluded that studied adolescents who had a higher level of smartphone addiction, had poor quality of life and healthy smartphone usage behavior had affected positively on their quality of life.

Conclusion

Smart phone addiction rate was higher among adolescents in urban area than on rural area. Also, Quality of life of adolescents was significantly affected by their smart phone addiction in all

domains (physical, mental, social, and environmental Health). Moreover, there was a strong negative significant correlation between adolescents' smart phone addiction rate and quality of life among studied adolescents.

Recommendations

In the light of the present study findings, the following recommendations are suggested:

1) Ongoing educational programs to adolescents, parents and teachers about proper use of smartphone, negative effects of smart phone use, smart phone addiction and how to deal with this issue.
2) Media attention to the smart phone addiction and provide widespread awareness programs to manage the arising problems from it.
3) Appropriate referral for addicted adolescents to specialized organization for treatment and rehabilitation.
4) Further researches should be applied on a larger sample to examine the relationship between smartphone addiction and quality of life among various age groups.

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