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Risk Factors of Smartphone Addiction among Adolescents at Zagazig University

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Abstract
Background: Smartphone became an integral part of our daily lives which used frequently among adolescents and has serious health negative effects on them. There are many risk factors can contribute of smartphone addiction as family's current situation, which includes parenting style, parents' current marital status and family size. Additionally, monthly income, residence, and adolescents in two-parent families and in double-income families are more likely to be addicted to smartphones.
Aim of the study: was to explore the risk factors of smartphone addiction among adolescents at Zagazig University.
Subjects and Methods: Research design: A cross-sectional descriptive research.
Setting: The study was conducted at Zagazig university, Egypt. **Subjects**: five hundred and forty-four students from practical and theoretical colleges were participated by stratified multistage random sampling technique.
Tools of data collection: two tools were used in this study. tool I: a structured questionnaire composed of (personal, academic and family data, and pattern of smartphone use), tool II: Smartphone Addiction Scale. **Results**:(57.7%) of the adolescents were smartphone addicts. The majority (91.7%) of the students preferred using social networking applications.
Conclusion that there more than half of adolescents were smartphone addict. Browse the Internet, social networking sites, listening to audio files (songs/Quran), games and smartphone using time for phone calls during the day (average) were positive strong predictors of smart phone addiction among adolescents.
***Recommendations*:** The study recommended that organize and implement training programs for adolescents in particular the university students to raise their awareness on proper smartphone use, risk factors of smartphone addiction and its negative health effects on the students.

Keywords*: Addiction, Adolescents, Risk factors, Smartphone.*

Introduction

Over the past decade, the number of smartphone users has rapidly increased worldwide. Today, the smartphone has become a major screen device that is used to access various media content, including social media, videos, games, and music. Smartphones also conveniently allow rapid information searches and facilitate social interaction. smartphone users, adolescents have the longest duration of use and the highest risk of smartphone overdependence compared with any other age groups. There are negative consequences of excessive smartphone use for adolescent development (**Kwon etal.,2022)**.

Smartphone addiction means spending time with a smartphone excessively. Adolescence is the most sensitive for all types of addiction and the hazardous for smartphone addiction. It affects the physical as musculoskeletal disorders of the hand, wrist, cervical spine, back muscles, pain, and fatigue, mental and

psychological problems such as elevates the risk of attention deficit, decreased sleep quality, depression, anxiety, social communication disorder, and academic quality of life of adolescents due to both excessive screen time. Decreased sleep quality can lead to long term sleep deprivation, which may increase the rate of smoking and alcohol use in adolescents **(Parlak et al.,2023).** The recent rise of these complaints in younger populations deserves attention and further investigation (**Torkamani &Mokhtarinia ,2023)**.

Risk factors for smartphone addiction include lack of awareness or education, personal predisposition, age, mental health conditions, perceived social pressure, lack of alternative coping mechanisms, boredom and escapism, availability and accessibility, and social influence. (**Ahmed and Harshi., 2024)**

At the same line, Family environment that includes adolescent's cognitive, emotional, cultural and social support available within his family as well as the family's current situation, which includes parenting style, parents' current marital status and family size. As, dysfunctional families experiencing domestic violence and parental addiction are more likely to be addicted to smartphones. Additionally, monthly income or residence, adolescents in two-parent families and in double-income families are more likely to be addicted to smartphones. Additionally, mental and social maturity in adolescent phase have not been achieved **(Buctot et al.,2020).**

Significance of the study:

Widespread and overuse of Smartphone among adolescents is a serious risk. It has been related to potential health related hazards and psychological disorders as lack of concentration, increased stress, depression, anxiety, social withdrawal, feeling of isolation, disturbed daily routine, loneliness, anxiety and sleep disturbances. Smartphones addiction has bad effect on quality of their lives, physical harmful as blurred vision, neck and shoulder pain and impairment of hand function, and academic performance. Egyptian university students, 60% of them suffered from depression sleep disturbances, smoking-related smartphone addiction, and suicidal tendencies ***(Okasha et al., 2022).***

So, special attention of community health nurses may be needed to identify the risk factors that can lead to smartphone addiction to be the corner stone for nursing education program that can contribute to mitigate the problem and design programs for proper and useful use smartphones for adolescents especially university students, with emphasizing on the right use of these devices for academic purposes, educate individuals about the risks of smartphone addiction, how to promote healthy habits and develop self-regulation skills. (**González-Vázquez et al.,2024).**

Aim of the study:

The aim of the study was to explore the risk factors of smartphone addiction among adolescents at Zagazig University.

Research question:

1. What is prevalence of smartphone addiction among adolescents at Zagazig University?
2. What are the risk factors of smartphone addiction among adolescents at Zagazig University?

Subjects and methods:

Research design:

A cross-sectional descriptive research design was used.

Study setting:

The study was conducted at Zagazig university. This Egyptian governmental university is located in Sharkia governorate, at grade1 and grade 2 from four colleges. These were practical (science, education) and theoretical (arts, commerce) colleges

***Sample criteria*:**

University students at Zagazig collage from grade1 and grade2 were eligible to be in the study sample based on the inclusion criteria of being18-20 years, agree to participate in the study, free from any physical and mental disability, both genders males and females, and from both theoretical and practical colleges.

***Sample size*:** The sample size is calculated to detect the smartphone addiction score. The number of students in Zagazig university at grade1 and grade 2 are 75740 students. with power of test 80%, and confidence level 95%, the sample size calculated to be 544 students that increased to598 students, represented by 10% pilot study 54 students that was excluded

***Sampling technique*:** A stratified multistage sampling technique was used in recruiting students through the following stages:

- **Stage I (Colleges):** These were stratified into practical and theoretical. Two colleges were selected randomly from each stratum.
- **Stage II (Years):** Each of two practical colleges had four strata representing its two years, total sample of it (304) was divided, ending up with 76 with each group and each of two theoretical colleges had four strata of two years, total sample of it (240) was divided, ending up with 60 each group. This resulted in 8 groups of colleges and years. The total sample (544) was divided.
- **Stage III (Students):** Students were selected in each group randomly according to the required inclusion criteria.

Tools of data collection:

The required data were collected by using two tools as the following:

Tool I: A structured questionnaire was developed by the researchers in the light of the related literature to collect the necessary data of the study. It consists of two parts:

- ***The first part: Socio-demographic characteristics:*** It asked about: personal, academic and family characteristics of the student such as age, gender, residence, academic level, living condition, father's educational level and family income ...etc.
- ***The second part:*** **Knowledge and pattern of smartphone use:** asked about knowledge of smartphone use, duration of daily smart phone use, purpose of smart phone use, and years of smart phone use, irregular hours of smartphone use daily and applications that you are favorite on a smartphone…. etc.

Tool II:

- **Adolescent's Smartphone Addiction Scale: the scale** was a reliable and valid measure of addictive use of smartphone, developed by *(Kwon et al., 2013).* The scale consists of (33) items and distributed on six domains. These were daily life disturbance (items 1-5), positive anticipation (item 6-13), withdrawal (item14-19), cyberspace-oriented relationship (item 20-26), overuse(item27-30) and tolerance(item31-33).

***Scoring system*:** The responses are on a six-point Likert type scale from “strongly disagree” to “strongly agree,” scored from one to six, respectively. Total score 33*6= 198 grades, Addict= 100 -198 grades, and Non addict= 33-99 grades

Content validity& Reliability:

All the scales used have documented validity and reliability as previously described.

Fieldwork:

After securing the official approvals for conducting the study, the researcher met with the deans of the selected colleges to explain the aim of the study and the data collection procedure, and to determine the suitable time to collect data. The researcher obtained the distribution of sections and their places in each academic year from student affairs, followed by meeting with instructors of the randomly chosen sections. The researcher explained to them the aim of the study, and asked them to randomly choose 76 and 60 students from the students’ attendance list. Then, the selected students were asked to remain in their places after the section ended, the researcher informed the students about the aim of the study and the criteria for inclusion. Those willing to participate were asked to provide informed consent verbally. The data collection form was handed to recruit students to fill them in. The needed time required to fill out questionnaires for each section ranged from 30 to 45 minutes. The researcher stayed with the students to answer any specific questions that arose during completing the data. Finally, the researcher checked it for their completeness. The researcher went to the selected colleges 3 days per week from 11 AM to 2 PM. The field work was carried out within approximately a month and a half, starting from the mid of October 2023 to the end of November 2023.

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Pilot study:

A pilot study was carried out on a sample of 54 university students, approximately 10% of the calculated total sample size. The aim was to test the clarity and applicability of the data collection forms and to estimate the time needed for filling them in. The pilot sample was excluded from the main study sample.

Administrative and ethical considerations:

An agreement was obtained from the Research Ethics Committee (REC) in faculty of nursing, Zagazig University. Letters from postgraduate affairs at faculty of nursing was taken to obtain the agreement of university administration for doing this research on the subjects at colleges of Zagazig University. An official permission was obtained by submission of formal letters issued to the deans of colleges, Zagazig University to obtain their permission for data collection. An agreement of participants was taken after a fully explanation of the aim of the study; participants were given the opportunity to refuse the participation and they were notified that they could withdraw at any time of the data collection interviews; also, they were assured that the information would be confidential and used for the research purpose only. They were reassured about the anonymity and confidentiality of any obtained information.

Statistical analysis:

The statistical analysis of data was done by using the computer software of Microsoft Excel Program and Statistical Package for Social Science (SPSS) version 22. Data were presented using descriptive statistics in the form of frequencies and percentage for categorical data, the arithmetic mean (X) and standard deviation (SD) for quantitative data. Qualitative variables were compared using chi square test, P-value to test association between two variables. Correlation coefficient test (r) was used to test the correlation between studied variables. Linear regression model was used to modeling the relationship between smart phone addiction and more explanatory variables. Reliability of the study tools was done using Cronbach's Alpha. And the degrees of significance of results were considered as follows: P-value ≥ 0.05 Not significant (NS), P-value < 0.05 Significant (S) and P-value < 0.01 Highly Significant (HS).

Results:

According to **Table (1)**, shows that 49.1%of the total sample of studied students were aged 20years old, with mean SD 19.38±0.679 years and56.4% of them were female. More than half (58.8%) of them resided at urban areas. The majority of the students (95.4%) have no history of chronic diseases. More than half (56.6%) of them had good relationship with friends at college. 65.8% of the studied students didn't practice exercise. Likewise, 47.6% of them had an average academic level and 35.9% of them reported that their study load was too much.

Table (2): Illustrates that 72.4%of the studied students were living with their parents. Also,37.3% and 62.9%of the studied students' fathers had secondary education and were farmers or workers, respectively. Likewise, 38.6% and 79.2% of the studied students' mothers had secondary education and were housewives, respectively. Also, 59.0% of them had 3-4 siblings. Regarding monthly family incom,51.8% of the studied students reported that monthly family income was just enough. Moreover, 56.4% of them were having more than one person in the room

Table (3): Shows that 59.9%of the studied students had smartphone ownership from 2-4years and 60.3% of them had a smart phone due to communicating with family and others. More than half (57.0%) of them reported that the study increased using of a smartphone and 65.1% of them sometimes used hand-free (headphones) when using a smartphone. Likewise, 46.1% of them used smartphone from 1-2 regular hours and 43.9% of them used smartphone from 4-6 irregular hours daily. In addition, 37.9% of them used smartphone from 1-2 hours for phone calls during the day. Furthermore, the majority (91.7%) of the students preferred using social networking applications.

Figure (1): shows that 57.7% students in the study sample were smartphone addicts.

Table (4): concerning the relations between total smart phone addiction of the studied students and their personal characteristics, table (4) indicates statistically significance relations with academic level, study load, practice any exercise, number of friends, relationship with friends at college, and history from any chronic disease at (P= < 0.01). It was obvious that average academic level, normal study load, no practicing any exercise, ≥ 4 number of friends, normal relationship with friends at college, and no suffering from any chronic

disease were related to smartphone addiction. However, there is no other statistically significant relations with the other personal characteristics.

Table (5): regarding the relations between total smartphone addiction the studied students and their family characteristics, table (5) indicates highly statistically significant relations with living condition, father's and mothers' educational level, number of siblings, crowding rate, and monthly family income at (P= < 0.01).It was evident that living with both parents, Secondary education of fathers' educational level ,read and write of mothers' educational level, number of siblings, more than one person in the room in crowding rate and just enough monthly family income were related to smartphone addiction. No other statistically significant relations were found with other family characteristics.

Table (6): concerning the relations between total smartphone addiction the studied students and their pattern of smartphone used, table (6) shows highly statistically significant relations with duration of smartphone ownership (years),used hand-free (headphones) when using a smartphone, regular hours of smartphone used daily, irregular hours of smartphone used daily, and smartphone used time for phone calls during the day (average) at (P= < 0.01).It was obvious that 5-7years of smartphone ownership, sometimes using hand-free (headphones) when using a smartphone, duration from 3-4 regular hours of using smartphone daily , ≥ 7 irregular hours of using smartphone daily, and more than 3 hours of using smartphone for phone calls during the day were related to smartphone addiction.

Table (7): reveals the presence of a highly significant model, as indicated by the F-test result of 188.10 with a p-value of 0.000. This model explained majority (84.2%) of the variation in risk factors affecting the smart phone addiction, with an R-squared value of 0.842. Furthermore, it demonstrated that sex (Male), academic level (Poor), No practicing exercise, monthly family income, duration of smartphone ownership, using browse the Internet, social networking sites, listening to audio files (songs/Quran), games and smartphone using time for phone calls during the day (average) were statistically significant independent positive strong predictors of smart phone addiction with a p-value of<0.01. conversely, fathers and mothers' educational level were negative predictors of smart phone addiction with a p-value of<0.05.

Discussion:

Smartphones, progressively influencing adolescents' daily lives, have become an essential component of their everyday routine. Especially among university students, smartphones play a pivotal role **(Osorio-Molina et al., 2021)**. Despite that, smartphone addiction can lead to negative effects on both mental and physical health, including poor sleep quality, reduced social interactions, and increased stress levels, and their overall quality of life **(Zhang et al., 2024).**

More than half of the studied students of the current study were female students, with mean age around 20 years. Almost two thirds of the studied students didn't practice exercise. More than one third of them reported that their study load was too much. Besides, more than half of them from urban area. These factors would certainly have an impact on smartphone addiction will be detailed from the discussion of the study findings.

Addressing the first research question, the present study results indicated that more than half of the students in the study sample were smartphone addict. This might be due to adolescent students are increasingly using smartphones for exchanging news and knowing what is happening around. Smartphone is considered a sign of keeping up with global modernization. Moreover, due to availability and accessibility to the internet, and access to different social media platforms. This finding was congruent with a study conducted by **Desouky& Abu-Zaid, (2020)** in Saudi Arabia who reported high prevalence of smartphone addiction among more than half of the studied students. In the same vein with foregoing study results, **Dhamija et al., (2021)** in India whose study emphasized that more than half of the participants demonstrated smartphone addiction. These findings were contradicted with a study conducted in Nigeria by **Ayandele et al., (2020)** who found that less than one fifth of the respondents were probably smartphone addicts or were at-risk of smartphone addiction. These discrepancies among studies might be attributed to cultural differences among communities regarding this age group.

Addressing the second research question, it was obvious that average academic level of the studied students was related to smartphone addiction, and poor academic level identified as independent positive predictor of smartphone addiction. This might be due to the fact that students with lower academic levels may struggle with time management and prioritization, leading to excessive smartphone use as a form of distraction or escapism. In the same vein, **Orabi, (2024)** in Egypt who found that bad degree of academic achievement was a predictor of smartphone addiction. Likewise, another study by **Ibrahim et al., (2022)** in Egypt stated that there were statistically significant association between the student's academic achievement and smartphone addiction.

As for study load, the current study results showed that students with normal study load were smartphone addict. This might be due to the fact that students with higher study load may have less free time to engage with their smartphones, as they are more focused on managing their academic responsibilities. In this regard, **Mohamed & Moustafa, (2021)** in Egypt found that there was significant association between the students' study load and smartphone addiction. In contrast, **Okasha et al., (2022)** in Egypt who declared that academic stress and overload can actually increase smartphone addiction as a way to cope with stress, as an escape mechanism. These discrepancies might be attributed to differences in contextual factors, such as the specific academic environment, individual coping mechanisms, and the type of academic demands.

In terms of doing exercise, the present study demonstrated that students who didn't practice any exercise were smartphone addicted with highly significant relation. This could be interpreted as when students do not engage in exercise, they may have idler time that is spent on their devices, fostering a dependency on smartphones for stimulation, social interaction, or relaxation. Align with this result, a study conducted by **Alsayed et al., (2020)** in Saudi Arabia who declared that lack of physical activity was strongly associated with sedentary behaviors, including excessive smartphone use.

Concerning number of friends, the present study revealed that, students who had4 and more of friends experienced smartphone addiction. This might be due to the fact that having a larger number of friends can increase social interactions, both online and offline, which often translates to more frequent use of smartphones to stay connected. This finding was in agreement with a study carried out by **Alkın et al., (2020)** in Turkey who stated that students with larger friend circles were often engaged in more social media activities, which may lead to increased screen time and, consequently, smartphone addiction.

As regard relationship with friends at college, the present study reflected that students with normal relationship with friends were smartphone addicted. This can be interpreted as students who are socially engaged but maintain average social bonds may rely on smartphones to fulfill additional social needs or seek engagement beyond face-to-face interactions. In a similar vein, **Osorio-Molina et al., (2021)** in Spain whose study found that there was significant association between the students' smartphone addiction and their friendship. On the other hand, **Azabet al., (2019)** in Egypt who argued that the students' relationship with their colleagues had no significant impact on smartphone addiction. This discrepancy might be attributed to educational and familial expectations around technology use that can vary across cultures.

Regarding suffering from any chronic disease, the present study indicated that free from any chronic disease was related to smartphone addiction. This might be due to the possibility that students with chronic diseases may already have structured routines and medical management strategies that reduce their likelihood of developing addictive behaviors, such as smartphone addiction. This result was similar to a study conducted by **Achangwa et al., (2022)** in South Korea found that there was significant association between smartphone addiction and the students' suffering from chronic diseases. Conversely, a study by **Kaya& Kaya, (2020)** in Turkey showed that having a chronic disease was not a predictor of smartphone addiction among the studied students. This discrepancy might be attributed to several factors, including cultural differences, variations in research methodology, and the specific populations studied.

The current study represented that parents' educational level were negative predictors of smart phone addiction. It was evident that living with both parents, secondary education of fathers, and mothers who read and write were related to smartphone addiction. This might be due to the fact that living conditions and parental education levels play a crucial role in shaping students' behavioral patterns and coping mechanisms. In the same line, a study conducted by **Rashmi et al., (2022)** in India stated that parents with higher education levels were more aware of the dangers of excessive smartphone use and were likely to regulate their children's screen time

more effectively. Conversely, **Abid et al., (2020)** in Pakistan whose study noticed that living away from familywise predictor of smartphone addiction among the studied students. This discrepancy might be attributed to several factors, including cultural differences in parenting styles, socioeconomic conditions, and varying levels of access to educational resources.

In addition, the present study illustrated that, the effect of family income was confirmed as positive predictor of smart phone addiction. It was evident that number of siblings, more than one person in the room in crowding rate and just enough monthly family income were related to smartphone addiction. This might be due to the fact that larger family sizes and higher crowding rates can create environments where personal space and individual attention are limited, leading to a reliance on smartphones as a means of escaping or seeking entertainment. Additionally, in families with limited financial resources, where the income is just enough to meet basic needs, smartphones may serve as a primary and affordable source of leisure or communication.

The present study was in harmony with a study by **Alavi et al., (2020)** in Qatar who declared that students from larger families or those experiencing crowded living conditions had smartphone addiction. Also, a study in Qatar by **Chemnad et al., (2023)** who stated that low family income was a predictor of smartphone addiction among the students. On the other hand, **Ibrahim et al., (2022)** in Egypt whose study noticed that income did not significantly impact smartphone addiction, as both low- and high-income individuals were equally susceptible, depending on the type of smartphone usage.

The current study showed that there were highly statistically significant relations between smartphone addiction toward duration of smartphone ownership, using hand-free, regular hours of smartphone using daily, irregular hours of smartphone using daily, and smartphone using average time for phone calls during the day. It was also confirmed through multivariate analysis as independent positive predictors of smartphone addiction. It was noticed that students who had from 5 to 7years of smartphone ownership, sometimes using hand-free, using smartphone daily from 3 to 4 regular hours, using smartphone for 7 or more irregular hours per day, and using smartphone more than 3 hours for phone calls during the day were more likely to have smartphone addiction. This might be attributed to the fact that development of habitual behaviors is linked to greater addiction potential.

This result was in accordance with a study by **Lim et al., (2021)** in Malaysia who highlighted that longer smartphone ownership can lead to more ingrained behavioral pattern where individuals rely heavily on their devices for communication, entertainment, and information. Align with this result, **Alsayed et al., (2020)** in Saudi Arabia whose study demonstrated that students who engaged in irregular and prolonged smartphone use were at a higher risk of developing addiction-like behaviors. On the other hand, **Cho, (2020)** in Korea argued that it was not just the length of smartphone ownership that mattered but rather the context of use and personal characteristics that determined smartphone addiction levels. This discrepancy might be attributed to several factors, including cultural differences, varying definitions of smartphone addiction, and the methodologies employed in each study.

Finally, the current study represented that sex (Male), using browse the internet, social networking sites, and listening to audio files and games were statistically significant independent positive strong predictors of smart phone addiction. Likewise, a study conducted by **Zhang et al., (2024)** in China who found that males were more likely to engage in behaviors like excessive gaming and internet browsing, which were often linked to smartphone addiction. Also, a study conducted by **Chemnad et al., (2023)** in Qatar who agreed that using smartphone for activities like social networking and games contributed to smartphone addiction.

Conclusion:

Based on the current study findings it can be concluded that:

More than half of the university students were smartphone addict, and sex (Male), academic level (Poor), No practicing exercise, enough family income, duration of smartphone ownership, using browse the Internet, social networking sites, listening to audio files (songs/Quran), games and smartphone using time for phone calls during the day (average) were positive strong predictors of smart phone addiction. conversely, fathers and mothers' educational level were negative predictors of smart phone addiction.

Recommendation:

On the basis of the most impotent findings of the study, the following recommendations are suggested:

- Educational training programs to raise awareness among university students on proper smartphone use and risk factors that lead to smartphone addiction.
- Activate the counseling services for smartphone addict individual to get rid of this harmful habit and decrease its hazards.
- Further researches are needed on large scale for generalization of results.

Results:

Table (1): ***Frequency distribution of the studied students according to their sociodemographic and academic data (n=544).***

Characteristics	No.	%
Age (year)		
18	61	11.2
19	216	39.7
20	267	49.1
Mean ± SD	**19.38±0.679**	
Gender		
Male	237	43.6
Female	307	56.4
Residence		
Urban	320	58.8
Rural	224	41.2
Do any exercise		
Yes	186	34.2
No	358	65.8
History of chronic disease		
Yes	25	4.6
No	519	95.4
Study load		
Too much	195	35.9
Normal	183	33.6
Little	166	30.5
Relationship with friends at college		
Good	308	56.6
Normal	186	34.2
Bad	50	9.2
Academic level		
Excellent	188	34.6
Average	259	47.6
Poor	97	17.8

Table (2): Frequency distribution of the studied students according to their family characteristics (n=544).

Characteristics	No.	%
Living condition		
Both parents	394	72.4
One parent	131	24.1
One relative	19	3.5

Father's educational level		
Illiterate	50	9.2
Read and write	74	13.6
Basic education (primary, preparatory)	66	12.1
Secondary education	203	37.3
University or postgraduate	151	27.8
Father's job		
Employee	83	15.3
Farmer or worker	342	62.9
Craftsman (carpenter, plumber, etc.)	30	5.5
Professional (doctor, engineer, teacher)	73	13.4
Free worker	16	2.9
Mother's educational level		
Illiterate	60	11.0
Read and write	79	14.5
Basic education (primary, preparatory)	65	12.0
Secondary education	210	38.6
University or postgraduate	130	23.9
Mother's job		
Working	113	20.8
Housewife	431	79.2
Number of siblings		
None	12	2.2
1-2	141	25.9
3-4	321	59.0
≥5	70	12.9
Monthly family income		
Enough and saving	189	34.8
Just enough	282	51.8
Not enough and borrowing	73	13.4
Crowding rate		
One or less people person in the room	237	43.6
More than one person in the room	307	56.4

Table (3): Frequency distribution of the studied students according to their pattern of smartphone use (n=544).

Pattern of smartphone use	No.	%
Duration of smartphone ownership (years)		
2-4	326	59.9
5-7	160	29.4
≥ 8	58	10.7
Mean ± SD 4.67±2.86		
***Why do you have a smart phone?**		
Proving oneself	57	10.5
Like my friends	141	25.9
Communicating with family and others	328	60.3
Social appearance	256	47.1
To study	310	57.0
***Which of the following increase your use of a smartphone?**		
Free time	179	32.9

To study	310	57.0
Online courses	118	21.7
Feeling of loneliness	106	19.5
Feeling anxious	75	13.8
Self proves	100	18.4
Feel depressed	98	18.0
Use hand-free (headphones) when using a smartphone		
Yes	116	21.3
Sometimes	354	65.1
No	74	13.6
Regular hours of smartphone use daily		
1-2	251	46.1
3-4	204	37.5
≥ 5	89	16.4
Mean ± SD	**2.56±1.55**	
Irregular hours of smartphone use daily		
1-3	115	21.2
4-6	239	43.9
≥ 7	190	34.9
Mean ± SD	6.09±3.37	
Smartphone use time for phone calls during the day (average)		
Less than an hour	179	32.9
1-2 hours	206	37.9
2-3 hours	53	9.7
More than 3 hours	106	19.5
***Which of these applications is your favorite on a smartphone?**		
Camera	104	19.1
Internet browser	199	36.6
Games	368	67.6
Sending text messages	59	10.8
Social networking	499	91.7
YouTube	10	1.8

Figure (1): Prevalence of smartphones addiction among the studied students at Zagazig university (n=544

Figure (1) shows that 57.7% students in the study sample were smartphone addicts.

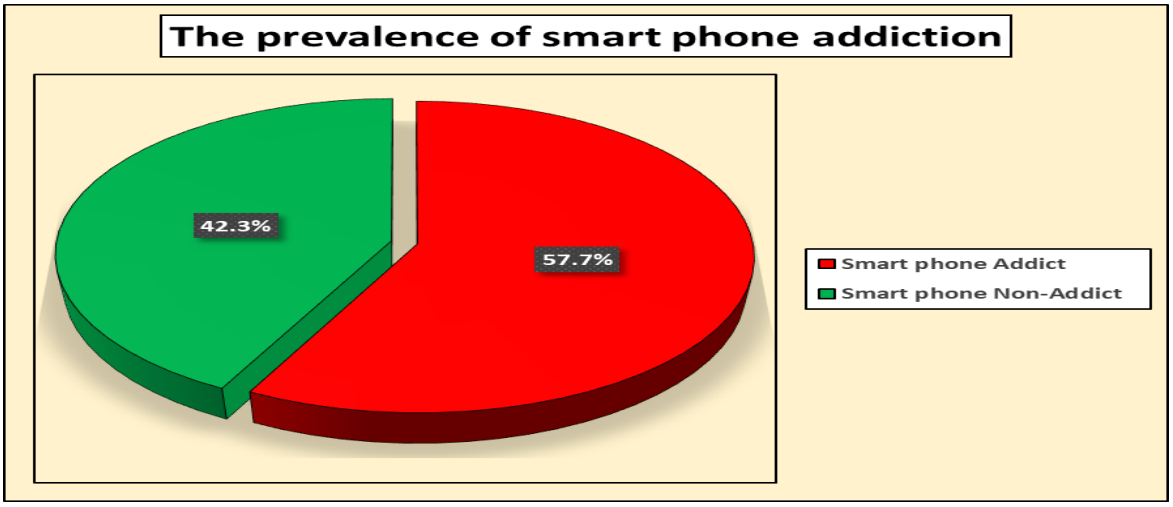

Table (4): Relation between personal characteristics of the studied students and total smartphone addiction **(n=544).**

Personal characteristics		Total smart phone addiction				X^2	P-Value
		Smart phone Addict (n=314)		Smart phone non-addict (n=230)			
		No.	%	No.	%		
Age (years)	18	30	9.5	31	13.5	5.489	0.064
	19	117	37.3	99	43.0		
	20	167	53.2	100	43.5		
Gender	Male	143	45.5	94	40.9	1.179	0.278
	Female	171	54.5	136	59.1		
College specialty	Practical	172	54.8	132	57.4	0.368	0.544
	Theoretical	142	45.2	98	42.6		
Academic level	Excellent	55	17.5	133	57.8	135.94	0.000**
	Average	162	51.6	97	42.2		
	Poor	97	30.9	0	0.0		
Study load	Too much	62	19.8	133	57.8	84.41	0.000**
	Normal	136	43.3	47	20.4		
	Little	116	36.9	50	21.8		
Do any exercise	Yes	9	2.9	177	77.0	323.87	0.000**
	No	305	97.1	53	23.0		
Number of friends	1	21	6.7	0	0.0	27.24	0.000**
	2-3	134	42.7	91	39.6		
	≥ 4	149	47.4	139	60.4		
	None	10	3.2	0	0.0		
Relationship with friends at college	Good	88	28.0	220	95.7	247.65	0.000**
	Normal	176	56.1	10	4.3		
	Bad	50	15.9	0	0.0		
Suffer from any chronic disease	Yes	25	8.0	0	0.0	19.19	0.000**
	No	289	92.0	230	100.0		

X^2= Chi-square test. No statistically significant at p > 0.05. ** Highly statistically significant at p ‹ 0.01.

Table (5): Relation between family characteristics of the studied students and total smartphone addiction (n=544).

Family characteristics		Total smart phone addiction				X^2	P-Value
		Smart phone Addict (n=314)		Smart phone non-addict (n=230)			
		No.	%	No.	%		
Living condition	Both parents	164	52.2	230	100.0	151.70	0.000**
	One parent	131	41.7	0	0.0		
	One relative	19	6.1	0	0.0		
Father's educational level	Illiterate	50	15.9	0	0.0	217.61	0.000**
	Read and write	74	23.6	0	0.0		
	Basic education	66	21.0	0	0.0		
	Secondary education	80	25.5	123	53.5		
	University or postgraduate	44	14.0	107	46.5		
Father's job	Employee	83	26.4	0	0.0	6.677	0.098
	Farmer or worker	159	50.6	183	79.6		
	Craftsman	30	9.6	0	0.0		
	Professional	26	8.3	47	20.4		
	Free worker	16	5.1	0	0.0		
Mother's educational level	Illiterate	60	19.1	0	0.0	195.58	0.000**
		79	25.2	0	0.0		
	Basic education	56	17.8	9	3.9		
	Secondary education	76	24.2	134	58.3		
	University or postgraduate	43	13.7	87	37.8		
Mother's job	Working	62	19.7	51	22.2	0.476	0.490
	Housewife	252	80.3	179	77.8		
Residence	Urban	181	57.6	139	60.4	0.427	0.513
	Rural	133	42.4	91	39.6		
Number of siblings	None	12	3.8	0	0.0	97.27	0.000**
	1-2	96	30.6	45	19.6		
	3-4	136	43.3	185	80.4		
	≥5	70	22.3	0	0.0		
Monthly family income	Enough and saving	40	12.7	149	64.8	161.73	0.000**
	Just enough	211	67.2	71	30.9		
	Not enough and borrowing	63	20.1	10	4.3		

X^2= Chi-square test. No statistically significant at p > 0.05. ** Highly statistically significant at p ‹ 0.01.

Table (6): Relation between pattern of smartphone use of the studied students and total smartphones addiction (n=544).

Pattern of smartphone use		Total smart phone addiction				X^2	P-Value
		Smart phone Addict (n=314)		Smart phone non-addict (n=230)			
		No.	%	No.	%		
Duration of smartphone ownership (years)	**2-4**	**123**	**39.2**	**203**	**88.3**	**138.18**	**0.000****
	5-7	**133**	**42.3**	**27**	**11.7**		

	≥ 8	**58**	**18.5**	**0**	**0.0**		
Use hand-free (headphones) when using a smartphone	**Yes**	**116**	**37.0**	**0**	**0.0**	**109.83**	**0.000****
	Sometimes	**169**	**53.8**	**185**	**80.4**		
	No	**29**	**9.2**	**45**	**19.6**		
Regular hours of smartphone use daily	**1-2**	**21**	**6.7**	**230**	**100.0**	**465.14**	**0.000****
	3-4	**204**	**65.0**	**0**	**0.0**		
	≥ 5	**89**	**28.3**	**0**	**0.0**		
Irregular hours of smartphone use daily	**1-3**	**26**	**8.3**	**89**	**38.7**	**224.63**	**0.000****
	4-6	**98**	**31.2**	**141**	**61.3**		
	≥ 7	**190**	**60.5**	**0**	**0.0**		
Smartphone use time for phone calls during the day (average)	**Less than an hour**	**51**	**16.2**	**128**	**55.7**	**183.54**	**0.000****
	1-2 hours	**104**	**33.1**	**102**	**44.3**		
	2-3 hours	**53**	**16.9**	**0**	**0.0**		
	More than 3 hours	**106**	**33.8**	**0**	**0.0**		

X^2= Chi-square test. Highly statistically significant at p ‹ 0.01.**

Table (7): Multiple linear regression analysis for prediction of risk factors affecting the smart phone addiction.

Items	**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**P. value**	**95.0% Confidence Interval for B**	
	B	**Std. Error**	**Beta**			**Lower Bound**	**Upper Bound**
Constant	-29.459-	22.328		-1.319-	.188	-73.321-	14.403
Age	1.835	1.095	.031	1.676	.094	-.316-	3.986
Sex (Male)	4.592	1.666	.056	2.756	.006**	7.864	1.319
Academic level (Poor)	3.727	1.308	.065	2.850	.005**	1.158	6.296
Residence	.319	1.722	.004	.185	.853	-3.702-	3.063
Don’t practice exercise	20.180	2.188	.237	9.222	.000**	15.881	24.479
Living away from parents	5.417	1.701	.072	3.184	.002**	2.074	8.759
Father's educational level	-4.077-	1.843	-.128-	-2.212-	.027*	-.456-	-7.698-
Mother's educational level	-2.724-	1.686	-.088-	-1.616-	.047*	-6.036-	.587
Monthly family income	4.815	1.372	.079	3.509	.000**	2.119	7.511
Duration of smartphone ownership (years)	1.275	.309	.090	4.132	.000**	.669	1.881
Browse the Internet	6.364	1.021	.158	6.236	.000**	4.359	8.369
Social networking sites	5.143	1.018	.124	5.053	.000**	3.144	7.142
Listen to audio files (songs/Quran)	7.515	1.157	.227	6.493	.000**	5.242	9.789
Games	8.957	1.034	.274	8.665	.000**	6.926	10.987
Smartphone use time for phone calls during the day (average)	4.367	1.024	.118	4.265	.000**	6.379	2.356
Model Summary							

Model	R	R Square	Adjusted R Square
1	0.918	0.842	0.838
ANOVA			
Model	**Df**	**F**	**P. value**
Regression	15	188.10	0.000**

Dependent Variable: Smart phone addiction score**.**

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