Problematic internet use through smartphones among school adolescents in Sohag City, Egypt

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Abstract:

Background: Smartphone ownership had a significant association with problematic use of the internet and internet addiction. **Objectives:** are to determine the prevalence of problematic internet use (PIU) through smartphone among adolescents and assess the sociodemographic characteristics affecting the internet use through smartphone and the effect of misuse on family and peer relations. **Methodology:** analytic cross- sectional study was carried out on 454 preparatory and secondary private school students in Sohag City, Egypt. Internet Addiction Test (IAT) was used to measure the internet use. **Results:** PIU was reported among 52.4% of the students whereas internet addiction (IA) occurred among 4% of the students. The mean score of IAT was significantly higher among males than females (54.7±16.9 versus 49.9±15.4 respectively, P= 0.002). social media activities were significantly higher among males (88.0%) whereas educational internet activities were significantly higher among females (75.2%). PIU and IA through smartphone was significantly higher among adolescents whom fathers were highly educated (56.0% &5.6% respectively) and among adolescents who had internet access at home (81.9% & 88.9% respectively). Bad/neutral relations with family members were significantly higher among those with PIU and IA (61.3 &7.5% respectively). **Conclusion and recommendations:** PIU through smartphones is prevalent among adolescents, males are more involved specially in social media activities. The PIU is significantly higher when internet access is available at home and among those whom fathers are highly educated. Bad family relation is significantly higher among adolescents with PIU and IA. Interactive and media awareness programs and parents control and restriction of smartphone use among adolescents are required.

Introduction:

Using modern technologies is a common feature of today's world. The Internet is one of the most widely used of these technologies, it plays an increasingly significant role in revolutionizing peoples' lives. [1]

Recently, it has been reported that internet based activities showed similar levels of addiction as those of drug and substance abuse. [2] An increasing number of studies have focused on the most important behavioral addictions today; the Internet, videogames, and smartphones. [3]

The concept of internet addiction (IA) refers to the excessive use of internet which in turn causes various problems in individual, social and professional aspects. The most basic symptoms are inability to restrict internet use, to continue internet use despite social or academic hazards and feeling a deep anxiety when access to internet is restricted. [4]

In spite of numerous cons of the internet, in case of being misused, it can be risky and lead to problematic internet use (PIU) or IA which interferes with one or more main aspects of life functioning such as profession, significant relationships, school, physical health or mental health. PIU has been well-thought-out as one of the epidemics of 21st century.[5] [6]

The Mental health professionals suggested considering internet addiction as a mental disorder in their recent edition of Diagnostic and Statistical Manual of Mental Disorders (DSM-5, 2013). [7] IA has the following symptoms: preoccupation with the internet; need to spend increasing amounts of time online; repeated but unsuccessful attempts to reduce internet use; suffering withdrawal symptoms from reduction of internet use; time management problems; environmental distress from school, family, work, and friends; deception of internet time; and mood modification through internet use.[8]

Adolescent IA varies widely internationally. Global prevalence rates of IA range from 1.5 - 8.2%.[9] In Europe, it ranges between 1- 9%. In Asia the prevalence has been reported to be between 2% and 18% whereas in the Middle East was found to range between 1-12%. Caution is required in interpretation and comparison of data from different studies as considering the scales used in assessment is crucial.[10]

Teenagers are likely to be the most susceptible population; they are particularly vulnerable to the initiation of addictive behaviors and they are the population subgroup most frequently using the internet, both for academic reasons or entertainment. [11, 12]

The latest generation of mobile phones (smartphones) allows people to engage in a wide range of online activities; checking email, playing video games, or involvement in social networks without being constrained to their home.[13] Smartphones are quickly replacing the lap-top or desk-top computer as the preferred method of accessing the internet. No one can now argue that it is a luxury to have ownership of a mobile phone particularly the smart ones.[3] [14]

Considering the multi-purpose, mobile, and internet capabilities of a smartphone, it has become a prevalent social phenomenon [15] and smartphone ownership had a significant association with IA. [16] Moreover, as the internet become more accessible through smartphone, the addiction pattern associated with smartphone has been shown more routinely and the concerns relating the phenomenon have increased.[2]

PIU comprises an important area of research as its negative consequences have been found to impact on everyday functioning, interpersonal relationships and emotional well-being [17] so there is a dead need to gain insight into the problem and develop and expand awareness about the harmful PIU. [5]

Rationale of the study: availability of smartphones increases the chance of problematic use of the internet among adolescents. we need to determine the prevalence of problematic use of the internet through smartphones as still there is paucity of local studied in this regard.

Study Questions:

- What is the prevalence of PIU through smartphones among adolescents?
- What are the sociodemographic determinants of PIU through smartphones among adolescents?

Study Objectives:

- Determine the prevalence of PIU and IA through smartphones among adolescents.
- Assess the sociodemographic characters affecting the internet use through smartphones and the effect of misuse on family and peer relations.

Methodology:
Study design: Analytic cross-sectional study.
Study setting: private preparatory and secondary schools in Sohag city, Egypt.
Study population: primary and preparatory school students (both males and females) attending private schools in Sohag City.

Inclusion criteria: students who have smartphone**s.**

    Private schools were chosen to increase the chance of owning personal smartphones among students.

Sample size:

The sample size was calculated using EPI info program. using a prevalence rate of PIU 40.3% as reported in Saudi Arabia by Dawood et al.[5] The calculated sample size was 357 at confidence level 95%. A total of 454 students were interviewed.

Sampling technique:

Private schools in Sohag city were stratified into male preparatory and male secondary schools, female preparatory and female secondary schools. one school was chosen randomly from each strata. School classes were used as a sample unit. 1st and 2nd preparatory and 1st and 2nd secondary school classes were included.

Data collection:

A semi-structured self-administered questionnaire was used for data collection. The questionnaire consisted of 3 parts:

Part I: included sociodemographic data: age, sex, school class, parent's level of education, mother work.

Part II: contains questions about:
- Relationship with parents, other family members and friends.
- Daily habits as reading and practicing sports, duration and purposes of internet use.

Part III: The Internet Addiction Test (IAT) scale developed by Young. [18]

The IAT is the most widely used questionnaire to assess PIU and IA. It is one of the most validated and widely used scales for evaluation of IA globally with many translated versions.[5] The Arabic version of the IAT is a valid and reliable instrument for use in the Arab world.[19]

IAT consists of 20 questions investigating the degree of preoccupation, compulsive use, behavioral problems, emotional changes, and diminished functionality related to internet use as perceived by the respondent. The responses are marked on a Likert scale from 0 to 5 (0=Does not apply; 1=Never; 2=Rarely; 3=Occasionally; 4=Often; 5=Always). Item points are added to comprise a continuous total score from 0 to 100, with higher scores indicating higher symptoms of PIU and IA. The overall score is classified to four categories: very low internet use ($\leq$19); normal internet use with good control and management of the time spent online (20–49); difficulties in controlling and managing the time spent online, with some consequences for the person's life (PIU) (50–79); and internet use causing significant problems in the person's life, with important consequences for emotions, relationships, and social functioning (IA) (80–100).[17] [20]

The scale showed very good internal consistency, with an alpha coefficient of 0.93.[19] [21]

Field work:

A pilot study was carried on 5% of the sample to assess clarity of the questions, the need for any rewording and/or rephrasing and time needed to fulfill the questionnaire. Results of the pilot study was not included in the study.

The questionnaire required about 20 minutes to be completed depending on the response of the participants.

One of the researchers was available in the classroom at the time of fulfilling the questionnaire by the students to clarify any questions and to ensure completion of the questionnaire.

Study period:

The field work was conducted between November, 2017 and February, 2018.

Statistical analysis

- Data were entered, cleaned and recoded using the Statistical Package for Social Science (SPSS Inc., Chicago, IL, USA) version 20.
- Data analysis: univariate analysis; descriptive statistics (frequency & percent for qualitative data, mean ± SD for quantitative data). Bivariate analysis: Chi-square test ($\chi2$) was used to test the difference between the proportions of qualitative variables. Student t test was used to compare the mean of different groups.
- Statistical significance level was considered when $p < 0.05$ for all statistical tests.

Ethical considerations:

- An official approvals for conducting the research was obtained from Sohag University, Central Agency for Public Mobilization and Statistics (CAPMAS), Issue number 771 and Ministry of education, Sohag governorate.
- The researchers assured voluntary participation of the students.
- Confidentiality of all data was assured.

Acknowledgment:

The researchers would like to acknowledge school personnel who facilitated and students who participated to complete the field work of the study.

Results:

Females represented 54.2% of participating adolescents, 52.6% were 2ry school students. More than half of the students' fathers (58.6%) and less half of the students' mothers (47.4%) were having university education. Working mothers represented 62.3% (Table 1).

More than half of the adolescents (52.4%) were having PIU whereas 43.6% of them were average online users. IA were reported among 4.0% of the adolescents (Fig. 1).

The highest internet uses were social media activities, educational purposes, news follow up, recreational activities and e-mail checking (fig.2)

The mean IAT score was significantly higher among males than females (54.7±16.9 versus 49.9 ± 15.4 respectively).

Regarding internet uses through smartphones according to gender, social media activities were significantly higher among males than females (88.0% versus 78.0% respectively). On the other hand, educational purposes were significantly higher among females than males (75.2% versus 64.9% respectively). Other internet activities showed no statistical significant differences by gender (Table 2).

PIU and IA through smartphones were significantly higher among adolescents whom fathers were highly educated (56.0% &5.6% respectively). Neither age, mother education nor job showed significant effect on internet use (Table 3).

Regarding social relations, bad/neutral relations with family members were significantly higher among adolescents who had PIU (61.3%) and IA (7.5%). Although adolescents with PIU / IA were having more bad/neutral problems with parents and friends but this difference was statistically insignificant (Table 4).

PIU and IA through smartphones were significantly higher among adolescents who had available internet access inside homes (81.9% & 88.9% respectively). The period of internet use showed no significant effect on the degree of internet use (Table 5).

There was no statistical significant difference regarding practicing hobbies (reading/ sports) and the degree of internet use through smartphones (Table 6).

Discussion:

Prevalence:

In the present study, more than half of the participants were having PIU, while 4.0% experienced significant problems (internet addiction) whereas 43.6% were average internet users. This is in concordance with other studies in Saudi Arabia and China.[5] [22] whereas a lower prevalence of PIU and IA Goel et al. was reported among high school students in many other studies. [21][23][24]

On the other hand, a much higher prevalence rate (15.1%) was also reported by Sasmaz et al.[25]

The reported IAT score in the present study was 52.1 ± 16.3 (20 - 90) which is conformed to the report of Dawood et al. [5], Ngai [20] whereas A much lower score was reported by Kilic et al. [23]

Gender difference:

The present study showed that the mean score of IAT was significantly higher among males. This is in concordance with [4] [5] [24]. Several studies from different areas in the world reported that male gender is an independent risk factor for PIU. [22] [23] [25] [26] [27]

Moreover, Anderson et al. [17] reported that the majority of the findings across different cultural samples support that males being at higher risk, and the difference between males and females regarding PIU is widening over time .

Different hypotheses and interacting factors were proposed to explain the differences revealed that males being targeted by the marketing strategies of higher PIU risk applications such as online games [26] [28] and also males in general are being at higher risk of developing addiction-related behaviors as PIU. [29] On the other hand, Oktuğ [30] reported that IA was higher among women than men.

As regards the different internet activities practiced, our study showed that activities on social media were significantly higher among males whereas using the internet for educational purposes was significantly higher among females. This is conformed to the finding of Çam & İşbulan [31] who reported that female students are less dependent on Facebook than male students.

Interpersonal relation:

Our study reported higher percent of bad interpersonal relation of adolescents who had PIU and/ or IA with their parents, family members and friends.

Bahrainian et al. [32] reported that IA was associated with interpersonal factors such as perceived discontentment with peer interactions, few social friends and problems with parenting attitudes, family communication, family dissatisfaction, family cohesion and conflicting family relationships.

Moreover, an association was reported between greater internet use and a decline in participants' communication with family members in the household, a decline in the size of their social circle, and an increase in depression and loneliness.[33] Weiser noted that excessive internet use negatively influenced psychological well-being by reducing social integration.[34]

It is probable that people become depressed and develop lonely as a result of being deprived from face-to-face interaction. It is unclear if depression or loneliness turns people avoiding human contact and drives them to interaction intervened by an electronic device. Likewise, it is possible that people with definite personality traits and preferences are driven to excessive use of the internet and the addiction results in enhancing the personality traits and preferences that causes a vicious cycle.[35]

PIU showed no significant difference as regards age of the participants. On the contrary, Vigna-Taglianti et al.[24] reported significant higher prevalence among younger adolescents.

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PIU was significantly higher among adolescents whom fathers were highly educated. This may reflect high income and socioeconomic state that facilitates easy access to the internet at home and having the recently updated generations of smartphones with more internet use options. The same finding was reported by Kilic et al. [23] as a significant risk for IA.

In the same context, the present study also reported that indoor availability of the internet was significantly associated with higher IA and PIU. Vigna-Taglianti et al. [24] also reported that the majority of students accessed the internet from their home.

The years passed since first internet use didn't show significant effect on the internet use pattern in the present study. On the contrary, Nikhita et al. [27] reported that internet use was significantly associated with increasing number of years of use.

In the present study, the highest uses of the internet were; social media activity, educational purposes, following news, recreational activities and e-mail messaging. The same activities were also reported by Tarimo & Kavishe [3] among secondary school students in Tanzania and Ngai [20] among students in Hong Kong.

Conclusion:

The present study concluded that PIU through smartphones is prevalent among adolescents, males are more involved specially in social media activities. The PIU is significantly higher when internet access is available at home and among those whom fathers are highly educated. Bad family relation is significantly higher with PIU and IA.

Recommendations:

- Develop and expand awareness programs about the harmful consequences of internet use through interactive programs and mass media.
- parents could be suggested to supervise/restrict use of mobiles phones to only few hours per day among their children
- make use of non-smartphones and restrict the use to necessary ones in case of young users.

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Table (1): Socio-demographic characteristics of participating adolescents

Variable	N= 454	%
Gender:		
Male	208	45.8
Female	246	54.2
Age in completed years: (Mean ±SD)	15.2 ± 1.4	
≤ 15 years	215	47.4
> 15 years	239	52.6
School:		
Preparatory	215	47.4
Secondary	239	52.6
Father education:		
Less than 2ry education	81	17.8
Secondary education	107	23.6
University/ higher	266	58.6
Mother education:		
Less than 2ry education	153	33.7
Secondary education	86	18.9
University/ higher	215	47.4
Mother work status:		
Working	283	62.3
Housewives	171	37.7

Table (2): Gender differences regarding IAT score and different internet uses among adolescents

Variable	Gender		Statistical test	P-value
	Males N= 208	**Females** N= 246		
IAT score	54.7±16.9	49.9±15.4	T = 3.1	**0.002**
Different Internet activities: #			X^2	
Social media activities	183 (88.0%)	192 (78.0%)	7.7	**0.005**
Educational purposes	135 (64.9%)	185 (75.2%)	5.8	**0.01**
News follow up	132 (63.5%)	163 (66.3%)	0.4	0.5
Recreational activities	129 (62.0%)	152 (61.8%)	0.003	0.9
Checking E-mail	119 (57.2%)	140 (56.9%)	0.004	0.9

multiple response question

Table (3): Internet use through smartphones according to socio-demographic characteristics among adolescents

Variable	Internet use			X^2	P-value
	Average online users (N=198)	PIU (N=238)	IA (N=18)		
School:				2.1	0.3
Preparatory (≤15 years)	101 (47.0%)	105 (48.8%)	9 (4.2%)		
Secondary (>15 years)	97 (40.6%)	133 (55.6%)	9 (3.8%)		
Father education:				10.2	**0.006**
Secondary/ lower	96 (51.1%)	89 (47.3%)	3 (1.6%)		
University/ higher	102 (38.3%)	149 (56.0%)	15 (5.6%)		
Mother education:				3.6	0.2
Secondary/ lower	114 (47.7%)	117 (49.0%)	8 (3.3%)		
University/ higher	84 (39.1%)	121 (56.3%)	10 (4.7%)		
Mother work status:				1.2	0.5
Working	69 (40.4%)	95 (55.6%)	7 (4.1%)		
Housewives	129 (45.6%)	143 (50.5%)	11 (3.9%)		

Table (4): Social relations and internet use through smartphones among adolescents

| Variable	Internet use			X^2	P-value
	Average (N=198)	Frequent problems (N=283)	Significant problems (N=18)		
Relation with parents:				5.8	0.05
Bad/neutral	15 (28.3%)	35 (66.0%)	3 (5.7%)		
Good	183 (45.6%)	203 (50.6%)	15 (3.7%)		
Relation with family members:				7.9	**0.01**
Bad/neutral	25 (31.3%)	49 (61.3%)	6 (7.5%)		
Good	173 (46.3%)	189 (50.5%)	12 (3.2%)		
Relation with friends:				2.1	0.3
Bad/neutral	38 (40.0%)	51 (53.7%)	6 (6.3%)		
Good	160 (44.6%)	187 (52.1%)	12 (3.3%)		

Table (5): Internet use through smartphones according to place and period of internet use among adolescents

Variable	Internet use			X^2	P-value
	Average (N=198)	Frequent problems (N=238)	Significant problems (N=18)		
Indoor internet availability	140 (70.7%)	195 (81.9%)	16 (88.9%)	9.2	**0.01**
Outdoor internet use	121 (61.1%)	145 (60.9%)	12 (66.7%)	0.2	0.8
Period of use:				2.4	0.3
Less than 5 years (293)	133 (45.4%)	151 (51.5%)	9 (3.1%)		
5 years and more (161)	65 (40.4%)	87 (54.0%)	9 (5.6%)		

Table (6): Internet use through smartphones and practices of other hobbies among adolescents

Variable	Internet use			X²	P-value
	Average (N=198)	Frequent problems (N=238)	Significant problems (N=18)		
Reading:				3.4	0.2
Yes	168 (45.5%)	188 (50.9%)	13 (3.5%)		
No	30 (35.3%)	50 (58.8%)	5 (5.9%)		
Sports at least half an hour/ day:				3.1	0.2
Yes	108 (40.8%)	148 (55.8%)	9 (3.4%)		
No	90 (47.6%)	90 (47.6%)	9 (4.8%)		

Fig. (1): Classification of the internet use among adolescents
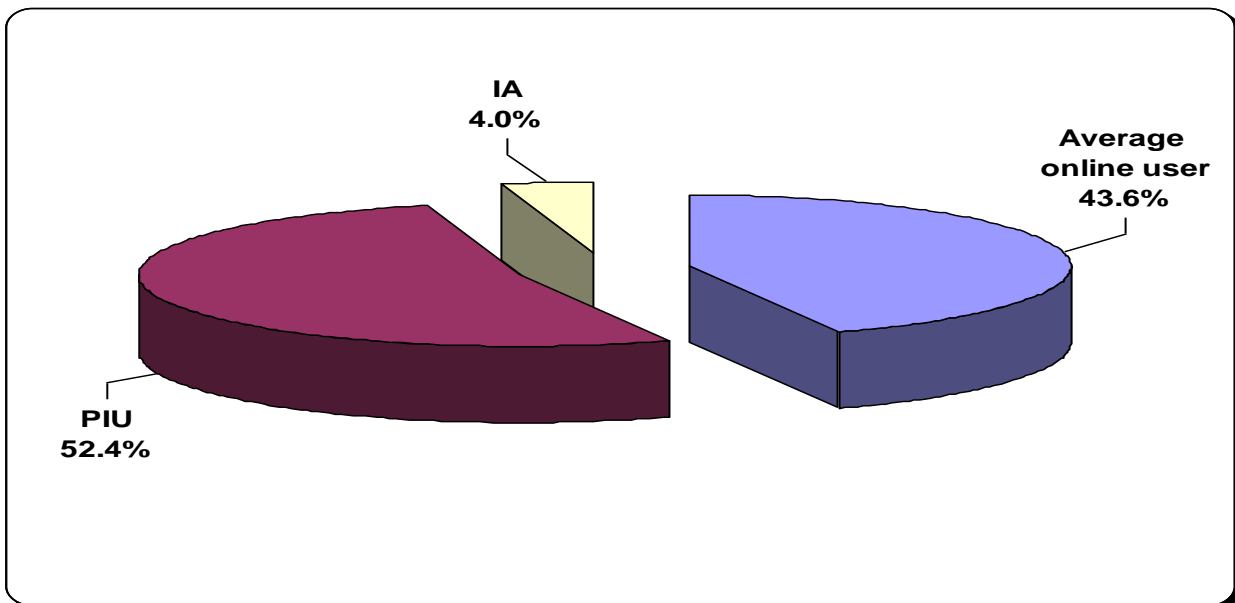
N.B   IAT score 52.1 ± 16.3 (20 - 90)

Fig. (2): Different internet uses through smartphones among adolescents