Insomnia and social network use among secondary school female students in Abha Sector

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Received: December 2020; Accepted: January 2021; Published: February 1, 2021.
Citation: Huda Ali Almusa. Insomnia and social network use among secondary school female students in Abha Sector. World Family Medicine. 2021; 19(1): 102-111 DOI:10.5742/MEWFM.2021.93989

Abstract

Background: Internet addiction and other problematic internet use behaviors can dramatically affect sleep hygiene, resulting in sleeplessness and other sleep disturbances. Excess internet and social media use are mainly associated with insomnia and increased time spent on the internet leads to the important disturbance of sleep. One psychophysical mechanism that could help to clarify the negative influence of problematic internet use on sleeping habits can be that nighttime computer use causes a state of high arousal, therefore, interfering with the soothing procedures that are essential for sleep. Sleep disturbance may result in stress which in turn affects student's scholastic performance.

Aim: The current study aimed to assess prevalence of internet addiction with its association with insomnia and scholastic achievement among secondary school females in Abha city, Saudi Arabia.

Methodology: A correlational cross-sectional approach was applied for the current research. The research targeted all secondary school female students in Abha city. A multistage cluster sample was applied by selecting schools and students from the Directorate of Education in Abha. Self-administered questionnaire sheets were distributed to students in their classes. The questionnaire covered students' socio-demographic data like age, grade, parents' education, work, and living conditions. Also, the tool included scales for internet addiction and perceived stress. Scholastic performance was measured by grades in the last year with absenteeism.

Results: The study included 3 50 female students whose ages ranged from 15 to 22 years old with mean age of 16.9 ± 1.1 years. Regarding father's education, 214 students' fathers were university graduated (61.5%) and 108 (31%) had secondary level of education. Regarding frequency of using social internet, 85.3% of the students reported usual use. Also, 83.9% of the students spend more than three hours daily using social networks. Internet addiction was reported among more than one third of the sampled students.

Conclusions & recommendations: In conclusion, the study revealed that more internet addiction was a significant problem among secondary school female students and affected their scholastic achievement and their life due to high stress.

Key words:
Internet addiction, students. Secondary school, stress, school performance

Introduction

Internet use including social media has increased dramatically worldwide with more than 2.5 billion actual users [1, 2]. Adolescents and young people are the main groups using internet facilities especially social media [3]. With the rapid growth in internet use, there is an increased trend of internet addiction, especially among adolescents, gaining increased attention from the popular media, government authorities, and researchers [4, 5]. In the past ten years, the rate of internet use among adolescents has increased extremely; 93% of adolescents of ages 12–17 years old go online in the U.S, as do 93% of Japanese, 71.8% of Chinese, and 74.5% of Indian adolescents [6]. Also, internet addiction magnitude in Iranian high school students was 22.2%, in Indians 25.5%, in Tunisians 18.05%, in Taiwanese 10.6% and in Turkish 07.9% [6, 7]. The internet addicts had higher rates of psychopathy (65.0%), suicidal thoughts in a week (47.0%), history of suicide attempt (23.1%), and attempt for suicides in one year (5.1%) [8].

Insomnia and sleep deprivation can induce serious effects, such as more liability for having physical and mental problems [9]. Sleep deprivation may be higher among adolescents who are at the most important period of physical, cognitive, and psychosocial development. These changes have a high effect and impact on their subsequent development [10]. Insomnia is one of the most frequent sleep deprivation problems usually recorded in adolescents [11]. Insomnia is clinically defined as a subjective perception of dissatisfaction with the amount and/or quality of sleep, usually difficulties falling asleep in spite of being in bed, waking up often during the night and having trouble going back to sleep, waking up too early in the morning or having an unrefreshing sleep [12]. High social media use can aggravate the occurrence of anxiety, depression, and suicide [13]. Social media overuse can negatively affect moral development in students, such as increased incidence of cyber-bullying [14] and internet addiction, which could lead to social withdrawal [15, 16]. Social media overuse and insomnia can affect the physical, psychosocial, cognitive, moral, and social development of students. Insomnia results in decreased health status, increased weight, and increased risk of cardiovascular and cardio metabolic disorders [17]. Insomnia may also affect student's psychosocial development, such as depression, anxiety, withdrawal, and aggression. The current study aimed to assess prevalence of internet addiction and its association with insomnia and scholastic achievement among secondary school female students in Abha city, Saudi Arabia

Methodology

A correlational cross-sectional approach was applied in the current study. The study was conducted at the female secondary schools (private and governmental) in Abha sector during the period from 2018 to 2020. There are about 30 governmental schools having about 5,000 female students in the secondary stage and four private schools with about 200 female students. Inclusion criteria were being a female student, able to communicate, agreed to participate in the study. Students with clinically diagnosed psychological disease, and females who refused to participate in the study were excluded. A total sample of 350 female students from a total of 6,000 students were required to detect average sleep disorders rate among social network users of 32% [18] with precision of 5% at 95% confidence level. The sample size was calculated using PASS software. Sampled students were selected from private and governmental schools using probability proportionate to size. A stratified sampling technique was used for selecting female students. Schools were stratified into governmental and private and then female students within each selected school were included randomly using systematic sampling method including each 3rd student. The sample distribution among schools was based on probability proportionate to size method using the list of names obtained from the school after explaining the benefit and importance of the research. After obtaining permission from Institutional ethics committee, data collection started. Data were collected from students directly using pre-structured data collection tool covering the following data: Students socio-demographic data like age, family data, residence, parents' education, Social media use data including age of first use, duration of use, peak time for use, and sites visited. Scholastic achievement data included studying hours, days of absenteeism, and grades of last year. Social network use and addiction were measured using Kimberly's Internet Addiction Test (IAT) [19]. It comprises 20 questions based upon a five-point Likert scale, which measures the severity of internet addiction (weak, moderate, severe). The lowest and highest scores are 20 and 100 respectively. Higher score indicates more severe addiction to internet.

Scoring:

Score	*20-49*	*50-79*	*80-100*
The Severity of Internet Addiction	*No or little*	*Moderate*	*Severe*

Insomnia was measured using insomnia severity index (ISI) [20]. The ISI comprises seven items assessing the perceived severity of difficulties initiating sleep, staying asleep, and early morning awakening, satisfaction with current sleep pattern, interference with daily functioning, noticeability of impairment attributed to the sleep problem, and degree of distress or concern caused by the sleep problem.

Scoring:
0–7 = No clinically significant insomnia
8–14 = Sub threshold insomnia
15–21 = Clinical insomnia (moderate severity)
22–28 = Clinical insomnia (severe)

Data analysis

After data was extracted, it was revised, coded and fed to statistical software IBM SPSS version 22(SPSS, Inc. Chicago, IL). All statistical analysis was done using two tailed tests. P value less than 0.05 was considered to be statistically significant. For internet addiction and stress scales, discrete scores for each scale items were summed together and the total sum of scores was categorized according to scoring method in methodology section. Descriptive analysis based on frequency and percent distribution was done for all variables including demographic data, scholastic achievement variables and internet addiction with stress. Cross tabulation was used to assess distribution of students' internet addiction according to their personal data. Also, cross tabulation was done to test relations between internet addiction and student's scholastic achievement and stress. Relations were tested using Pearson exact probability tests. Scatter diagram was used to assess the correlation between student's internet addiction score and last year's grade.

Results

The study included 350 female students whose ages ranged from 15 to 22 years old with mean age of 16.9 ± 1.1 years. Regarding father's education, 214 students' fathers were university graduated (61.5%) and 108 (31%) had secondary level of education. As for fathers' work, 68.7% of the student's fathers worked at governmental jobs and 8.9% were not working. Considering mothers education, 56.6% of the student's mothers were university graduated while 44% were housewives. As for social level, it was reported as high by 130 students (37.4%) (Table 1).

Table 2 illustrates social internet use among the study students. Exactly 63.5% of the students used the internet for the first time at the age of 10-14 years. Regarding frequency of using social internet, 85.3% of the students reported usual use. Also, 83.9% of the students spend more than three hours daily using social networks. The most reported sites visited by the students were Facebook (39.4%), Snap Chat (25.6%), and What's App (7.2%). As for reasons for using social networks, entertainment was the most reported reason (53.4%) followed by following the current trend (24.7%), and search and share information (8.9%). Considering peak time spent on social media, 63.5% of the students reported before going to sleep.

Table 3 demonstrates scholastic achievement among the sampled female students. Good achievement was reported by 83.6% of the students and 1.7% reported excellent achievement. Studying for 1-2 hours was reported by 69.5% of the students and 44.3% reported rare absenteeism of school while 12.4% reported high absenteeism. Last year grades ranged from 85% to 100% with an average of 96%.

As for internet addiction among the surveyed students, it was clear that 31.6% of the students reported that they find themselves anticipating when they will go online again. Also, 31.3% reported they find that they stay online longer than intended. Besides, 28.7% said that they feel preoccupied with the Internet when off-line or fantasize about being online. And 28.4% reported that they block out disturbing thoughts about their life with soothing thoughts of the Internet. About 11.5% of the students try to hide how long they have been online. Figure 1 shows that 31% of the students in total had moderate internet addiction and 3.7% had severe internet addiction.

Table 4 shows the distribution of insomnia items among the surveyed students. About 28% of the students reported that they are highly dissatisfied with their sleep pattern. Also, 27% reported that sleep problems interfere severely with performing their daily activities. Besides, 26.8% had problems walking up too early and 24.7% were stressed due to sleep problems. In total, 25.6% of the students had moderate insomnia and 3.4% had severe insomnia while 33.3% had no insomnia (Figure 2).

As for predictors of students' internet addiction, Table 5 demonstrates that 40.4% of students who usually use social network had internet addiction compared to 2% of those who sometimes use the internet with recorded statistical significance (P=.001). Also, internet addiction was diagnosed among 39% of the students who spent more than three hours daily on internet compared to none of those who spent less than one hour (P=.001). As for reasons for internet use, addiction was recorded among 80% of those who use internet to find new friends and 45.2% of those using it for entertainment compared to 9.1% of those using it for studying with friends (P=.001). Table 6 illustrates the effect of internet addiction on having insomnia and student's scholastic achievement. Exactly 49.6% of the students who are addicted to internet use had severe insomnia compared to 18.1% of non-addict students (P=.001). Also, 78.5% of students addicted to internet study for 1-2 hours daily compared to 64.8% of non-addict group (P=.026). Good scholastic achievement was recorded among 74.4% of students who are addicted to internet use compared to 88.5% of non-addicted students (P=.003). Figure 3 demonstrates that there is a significant positive intermediate correlation between student's internet addiction score and their insomnia score.

Discussion

The current study aimed to assess the magnitude of internet addiction among the secondary school female students in Abha city, Southern Saudi Arabia. The study revealed that one third of the students had internet addiction or problematic internet use. This was mostly due to nearly one out of each four students starting social media use below the age of 10 years (too early) and nearly two thirds started at the age of 10-14 years which is the age of exploring all new fields for teenagers and being more involved without breakdown. More than 80% of the students reported that they always use social media platforms and for more than 3 hours daily without control. The most reported reason for using social media was not for study as expected or claimed to parents but

Table 1. Social internet use among secondary school females in Abha city, Saudi Arabia

Internet use		No	%
Age of first use of social media (years)	< 10 years	85	24.4%
	10-14 years	221	63.5%
	15-20 years	42	12.1%
Using social networks	Sometimes	51	14.7%
	Usually	297	85.3%
Hours spent on social media daily	< 1 hour	5	1.4%
	1-3 hours	51	14.7%
	> 3 hours	292	83.9%
Sites you visit on opening social network	WhatsApp	25	7.2%
	Facebook	137	39.4%
	Snap Chat	89	25.6%
	Instagram	1	.3%
	Others	96	27.6%
Reasons for using social network	Following the current trend	86	24.7%
	Find new friends	5	1.4%
	Search and share information	31	8.9%
	Means of communication	29	8.3%
	Entertainment purposes	186	53.4%
	Studying with my colleges	11	3.2%
Peak time spent on social media	Early morning	22	6.3%
	After back of school	105	30.2%
	Before going sleep	221	63.5%

Table 2. Scholastic achievement among sampled secondary school females in Abha city, Saudi Arabia

Scholastic achievement		No	%
Scholastic achievement	Good	291	83.6%
	Very good	51	14.7%
	Excellent	6	1.7%
Studying hours per day	1-2 hours	242	69.5%
	3-5 hours	69	19.8%
	> 5 hours	37	10.6%
Absenteeism of school due to fatigue	Rarely	154	44.3%
	Sometimes	151	43.4%
	Many times	43	12.4%
Last year grade	Range	85%-100%	
	Mean ± SD	96% ± 4%	

Table 3. Internet addiction among secondary school female students in Abha, Saudi Arabia

Internet addiction items	Rarely		Occasionally		Frequently		Often		Always	
	No	%	No	%	No	%	No	%	No	%
How often do you find that you stay online longer than you intended?	21	6.3%	54	16.1%	86	25.7%	69	20.6%	105	31.3%
How often do you neglect household chores to spend more time online?	56	17.9%	102	32.7%	68	21.8%	49	15.7%	37	11.9%
How often do you prefer the excitement of the Internet to intimacy with your partner?	59	18.7%	94	29.8%	64	20.3%	48	15.2%	50	15.9%
How often do you form new relationships with fellow online users?	103	41.7%	72	29.1%	33	13.4%	16	6.5%	23	9.3%
How often do others in your life complain to you about the amount of time you spend online?	71	24.8%	72	25.2%	68	23.8%	27	9.4%	48	16.8%
How often do your grades or schoolwork suffer because of the amount of time you spend online?	80	41.5%	62	32.1%	22	11.4%	19	9.8%	10	5.2%
How often do you check your e-mail before something else that you need to do?	111	50.2%	50	22.6%	23	10.4%	20	9.0%	17	7.7%
How often does your job performance or productivity suffer because of the Internet?	79	30.0%	86	32.7%	45	17.1%	26	9.9%	27	10.3%
How often do you become defensive or secretive when anyone asks you what you do online?	58	19.8%	79	27.0%	51	17.4%	47	16.0%	58	19.8%
How often do you block out disturbing thoughts about your life with soothing thoughts of the Internet?	43	13.6%	86	27.1%	65	20.5%	33	10.4%	90	28.4%
How often do you find yourself anticipating when you will go online again?	39	11.9%	99	30.1%	87	26.4%	0	0.0%	104	31.6%
How often do you fear that life without the Internet would be boring, empty, and joyless?	71	23.4%	79	26.0%	67	22.0%	37	12.2%	50	16.4%
How often do you snap, yell, or act annoyed if someone bothers you while you are online?	59	20.7%	83	29.1%	60	21.1%	39	13.7%	44	15.4%
How often do you lose sleep due to late-night logins?	82	37.1%	67	30.3%	34	15.4%	19	8.6%	19	8.6%
How often do you feel preoccupied with the Internet when off-line, or fantasize about being online?	31	9.8%	66	20.8%	86	27.1%	43	13.6%	91	28.7%
How often do you find yourself saying "just a few more minutes" when online?	56	20.0%	64	22.9%	67	23.9%	35	12.5%	58	20.7%
How often do you try to cut down the amount of time you spend online and fail?	75	31.6%	54	22.8%	40	16.9%	28	11.8%	40	16.9%
How often do you try to hide how long you've been online?	72	28.5%	78	30.8%	44	17.4%	30	11.9%	29	11.5%
How often do you choose to spend more time online over going out with others?	76	27.0%	60	21.3%	47	16.7%	34	12.1%	65	23.0%
How often do you feel depressed, moody, or nervous when you are off-line, which goes away once you are back online?	107	42.5%	97	38.5%	28	11.1%	20	7.9%	0	0.0%

Figure 1. Internet addiction level among secondary school female students in Abha city, Saudi Arabia

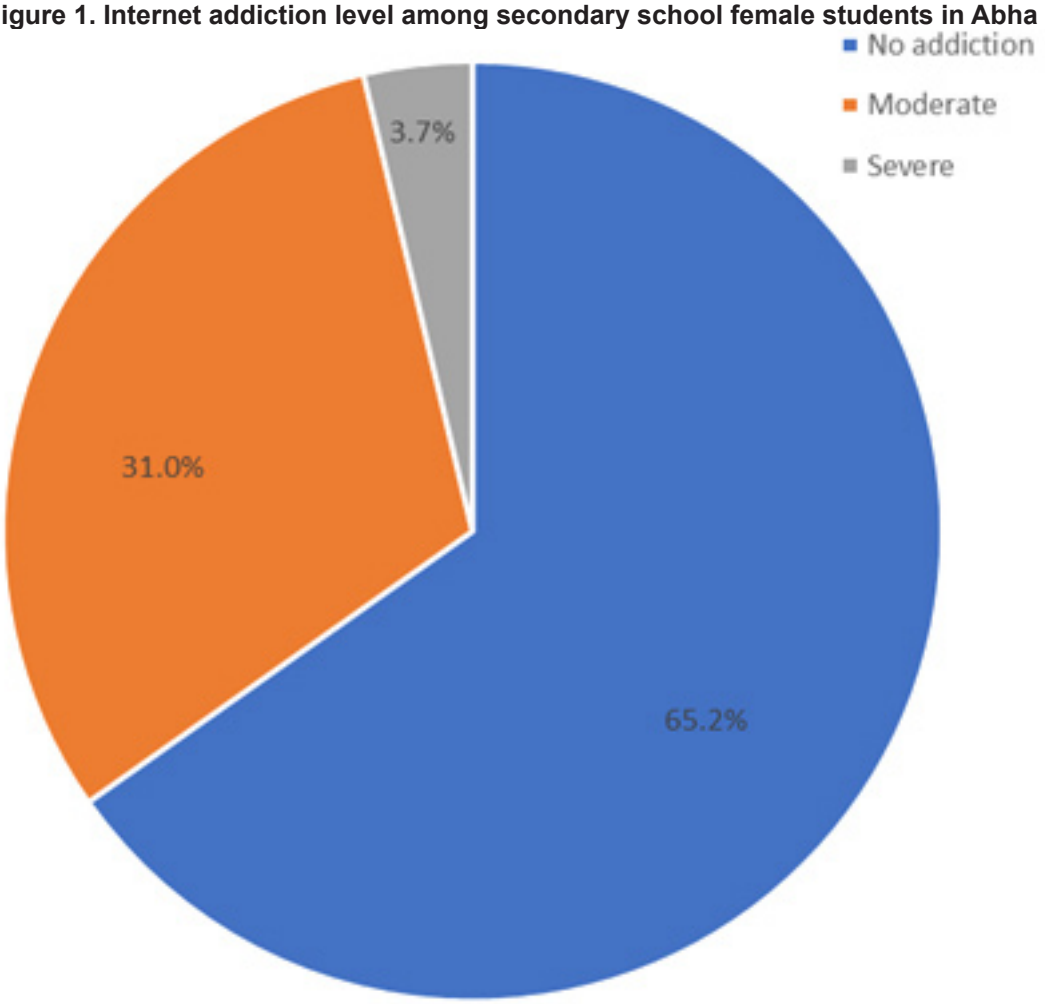

Table 4 Insomnia among secondary school female students in Abha city, Saudi Arabia

Insomnia items	None		Mild		Moderate		Severe		Very severe	
	No	%	No	%	No	%	No	%	No	%
Difficulty falling asleep	96	27.6%	107	30.7%	97	27.9%	28	8.0%	20	5.7%
Difficulty staying asleep	143	41.1%	81	23.3%	69	19.8%	32	9.2%	23	6.6%
Problems waking up too early	93	26.7%	72	20.7%	90	25.9%	50	14.4%	43	12.4%
How satisfied/ dissatisfied are you with your current sleep pattern	24	6.9%	87	25.0%	138	39.7%	59	17.0%	40	11.5%
How noticeable to others do you think your sleep problem is in terms of impairing the quality of your life	110	31.6%	77	22.1%	75	21.6%	46	13.2%	40	11.5%
How worried/ distressed are you about your current sleep problem	118	33.9%	77	22.1%	75	21.6%	41	11.8%	37	10.6%
To what extent do you consider your sleep problem to interfere with your daily functioning	74	21.3%	74	21.3%	106	30.5%	50	14.4%	44	12.6%

Figure 2. Overall insomnia level among secondary school female students in Abha city, Saudi Arabia

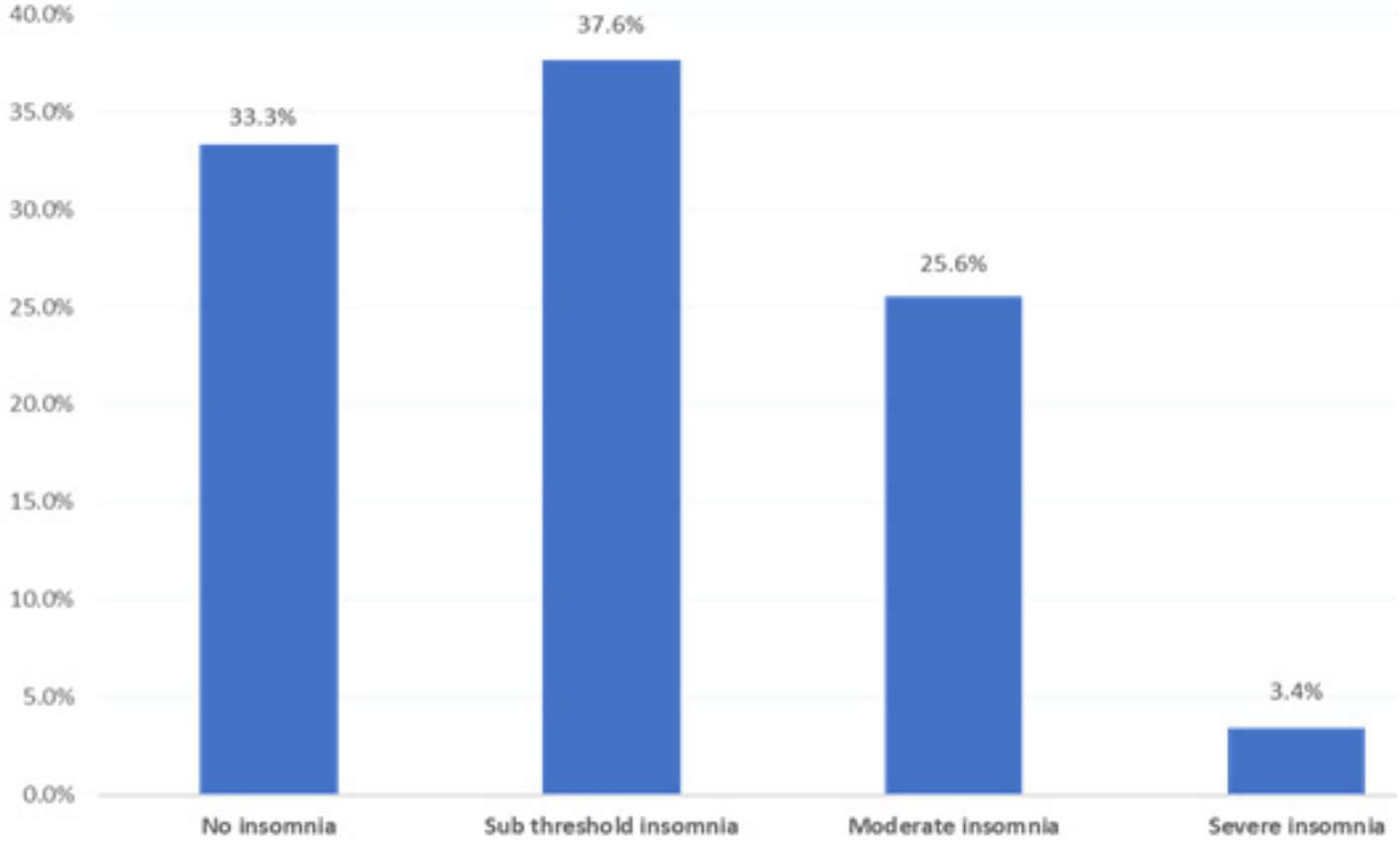

Table 5. Distribution of internet addiction by student's personal data, Abha city, Saudi Arabia

Personal data		Internet addiction level				P-value
		No addiction		Moderate/ severe		
		No	%	No	%	
Age in years	< 18 years	157	62.8%	93	37.2%	.128
	> 18 years	70	71.4%	28	28.6%	
Father education	Basic education	17	65.4%	9	34.6%	.547
	Secondary	66	61.1%	42	38.9%	
	University	144	67.3%	70	32.7%	
Father work	Not working	21	67.7%	10	32.3%	.747
	Governmental	158	66.1%	81	33.9%	
	Private	25	65.8%	13	34.2%	
	Free works	23	57.5%	17	42.5%	
Mother education	Illiterate	17	60.7%	11	39.3%	.745
	Basic education	29	72.5%	11	27.5%	
	Secondary	54	65.1%	29	34.9%	
	University	127	64.5%	70	35.5%	
Mother work	Housewife	98	64.1%	55	35.9%	.683
	Working	129	66.2%	66	33.8%	
Social level	Moderate	138	63.3%	80	36.7%	.328
	High	89	68.5%	41	31.5%	
Age of first use of social media (years)	< 10 years	57	67.1%	28	32.9%	.364
	10-14 years	139	62.9%	82	37.1%	
	15-20 years	31	73.8%	11	26.2%	
Using social networks	Sometimes	50	98.0%	1	2.0%	.001*
	Usually	177	59.6%	120	40.4%	
Hours spent on social media daily	< 1 hour	5	100.0%	0	0.0%	.001*
	1-3 hours	44	86.3%	7	13.7%	
	> 3 hours	178	61.0%	114	39.0%	
Reasons for using social network	Following the current trend	64	74.4%	22	25.6%	.001*
	Find new friends	1	20.0%	4	80.0%	
	Search and share information	28	90.3%	3	9.7%	
	Means of communication	22	75.9%	7	24.1%	
	Entertainment purposes	102	54.8%	84	45.2%	
	Studying with my colleagues	10	90.9%	1	9.1%	
Peak time spent on social media	Early morning	17	77.3%	5	22.7%	.470
	After back of school	68	64.8%	37	35.2%	
	Before going sleep	142	64.3%	79	35.7%	

P: Pearson X2 test
* P < 0.05 (significant

Table 6. Effect of internet addiction on student's scholastic achievement and insomnia, Abha city, Saudi Arabia

Scholastic achievement and stress		Internet addiction level				P-value
		No addiction		Moderate/ severe		
		No	%	No	%	
Scholastic achievement	Good	201	88.5%	90	74.4%	.003*
	Very good	23	10.1%	28	23.1%	
	Excellent	3	1.3%	3	2.5%	
Studying hours per day	1-2 hours	147	64.8%	95	78.5%	.026*
	3-5 hours	51	22.5%	18	14.9%	
	> 5 hours	29	12.8%	8	6.6%	
Absenteeism of school due to fatigue	Rarely	108	47.6%	46	38.0%	.109
	Sometimes	96	42.3%	55	45.5%	
	Many times	23	10.1%	20	16.5%	
Insomnia level	No/ subclinical	186	81.9%	61	50.4%	.001*
	Moderate/ severe	41	18.1%	60	49.6%	

P: Pearson X2 test
* P < 0.05 (significant

was for entertainment and this explains the long duration of enjoyment in using the platforms. The peak time for using social media was just before going to sleep which then caused lack of sleep with tiredness feeling. This can affect their ability for school attendance and teaching achievement. This can by the way explain their moderate scholastic achievement as the trend among students who recorded that they had good scholastic achievement and excellent grading was reported by very few numbers of the participants. This moderate achievement was due to insufficient studying hours as more than two thirds reported that they study for only 1-2 hours daily. Also, recurrent school absenteeism was reported among nearly half of the students. The study also revealed that there was a significant relation between internet addiction and high absenteeism, few studying hours daily, and lower scholastic achievement. Considering insomnia, the current study revealed that one third of the students had moderate to severe levels of insomnia (Figure 2). Nearly half of the students who had internet addiction had moderate to severe insomnia. On testing the direct and indirect effect of internet addiction on student's scholastic achievement (Figure 4), it was clear that higher internet addiction score was significantly inversely related with last year's grade, but insomnia wasn't related after adjusting for internet addiction effect, but internet addiction significantly affected student's insomnia (significant positive relation). Regarding social consequences, time-disruption was the most documented effect, which then disrupted regular social life, including academic, professional performance and daily practices [21]. Some studies also concluded that IAD can lead to interruption of social relationships among participants [22, 23]. It is, however, also noted by others that IAD is beneficial for peer relations in Taiwan [24]. Dr. Keith W. Beard (2005) states that "an individual is addicted when an individual's psychological state, which includes both mental and emotional states, as well as their scholastic, occupational and social interactions, is impaired by the overuse of [the Internet]" [25] Regarding physical symptoms, it includes a decreased immune system due to insomnia and insufficient sleep, lack of exercise, and increased the risk for musculoskeletal complaints. Symptoms of withdrawal might include agitation, depression, anger, and anxiety when the person is away from technology. These psychological symptoms might even turn into physical symptoms such as rapid heartbeat, tense shoulders, and shortness of breath [26, 27]. These findings were consistent with that reported by Siomos KE, 2008 in Greece [28]. The author reported that 70.8% of adolescents had access to the Internet. The most frequent type of Internet use is online games, representing 50.9% of Internet users, and information search, constituted 46.8%. The prevalence of Internet addiction among Internet users of Central Greece is 8.2%, especially the male students who play online games and visit Internet cafés. Also, Younes F et al, 2016 studied internet addiction and relationships with insomnia, anxiety, depression, stress, and self-esteem in university students [29]. Potential IAD prevalence was 16.8% (95% confidence interval: 13.81–19.79%), with a higher prevalence in males (23.6% versus 13.9%). Significant correlations were found between potential IAD and insomnia, stress, anxiety, depression, and self-esteem (p-value < 0.001); ISI and DASS sub-scores were higher and self-esteem lower in students with potential IAD. Sleep problems among internet addict group was assessed by Chen YL et al, 2016. Based on the results of used models, dyssomnias (odds ratio = 1.31), especially early and middle insomnias (odds ratio = 1.74 and 2.24), sequentially predicted internet addiction, and internet addiction sequentially predicted disturbed circadian rhythm (odds ratio = 2.40). A systematic review was conducted by Lam LT et al to address internet gaming

addiction, problematic use of the internet, and sleep problems [30]. Seven studies were included through a systematic literature search. Of these three focused on addictive Internet gaming and four on problematic Internet uses and sleep problems. Results of the review revealed that addictive gaming, especially massively multiplayer online role-playing games MMORPG, may be associated with poor quality of sleep. Results also indicated that problematic Internet use was associated with sleep problems including subjective insomnia and poor sleep quality.

Conclusions and Recommendations

In conclusion, the study revealed that nearly one third of the students had moderate to severe internet addiction, Internet use purpose was mainly for items other than studying. Also, more than one third of the students had significant insomnia due to lack of sleep hours. Scholastic achievement and attendance were moderately poor among the included students due to insufficient sleeping and few study hours, Internet addiction inversely affected students sleep and their scholastic achievement. Researchers recommended that students should learn the correct method and time for using internet by parents and schoolteachers. Students need periodic psychological assessment for early detection of any consequences of stress and health education sessions are crucial to improve their coping skills. Larger scale studies covering more areas and more schools (private and governmental) should be conducted to have better mapping of internet use and its consequences.

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