

## Internet Addiction Pattern and its Effect on the Life Style and Dietary Behavior of Secondary School Students' Health in Egypt

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**Abstract:** The internet has become an important tool for social interaction, information and entertainment. However, as the internet has moved into homes, schools and work, the prevalence of internet addiction has been increasing rapidly. Adolescent students are more vulnerable to internet addiction (IA) as they are more dependent on it, which will negatively impact their lifestyle and dietary behavior. The aim of the present study was to examine the effect of internet addiction on the life style and dietary behavior of secondary school students. *Design:* A descriptive correlational cross-sectional design was adopted for this study. *Sample:* A total number of 800 secondary school students were included in the study. *Setting:* The study conducted at 12 governmental secondary schools at Port Saied, Egypt. *Tools:* Data were collected via a structured questionnaire including socio-demographic data of the students, their lifestyle and dietary habits. Regarding the level of internet addiction, it was assessed by using Internet Addiction Test (IAT). *Results:* The mean age of students was 16.50±0.50 years. 30.9% of students were males and 69.1% of them were females. There were significant relationship between internet addiction and life style of students ( $P < 0.05$ ). Also, the results had shown that nearly half (42.8%) of the students had moderate internet addiction, while 2.5% of them had severe internet addiction. There was also a significant relation between all items of dietary behavior of students and their level of IA ( $p < 0.001$ ). *Conclusion:* The study concluded that improper internet usage by students, leads to internet addiction that negatively affected their lifestyle, dietary behavior, social relations and academic performance. The study recommended that, the government should take an active role in designing and implementing Internet addiction prevention programs directed to adolescent students, to raise their awareness regarding Internet addiction and its negative effects on their physical, social and psychological health.

**Key words:** Internet Addiction • Life Style • Dietary Habits • Secondary School Students

### INTRODUCTION

Internet addiction (IA) also known as problematic internet use or pathological internet use that can be described as the excessive or compulsive use of the internet which persists despite serious negative consequences for personal, social, or occupational function. It refers to excessive internet use that interferes with daily life. Addiction, defined by Webster Dictionary as a "compulsive need for and use of a habit-forming substance characterized by tolerance and

by well-defined physiological symptoms upon withdrawal", was traditionally used to depict a person's dependence on the substance. More recently, the concept has been applied to behavioral dependence including internet use [1, 2]. Experts on internet addiction have described this syndrome as an individual being intensely working on the internet, prolonged use of the internet, uncontrollable use of the internet, unable to use the internet with efficient time, not being interested in the outside world, not spending time with people from the outside world and an increase in their loneliness and

sadness. However, simply working long hours on the computer does not necessarily mean someone is addicted [3].

Internet access via smartphones, tablets and laptop computers has allowed people to enjoy many activities of work and leisure, regardless of time and physical location. Misuse of the internet by children and adolescents has become a major public health problem throughout the world [4]. Increasingly usage of technology and widespread dominance of the internet has faced many people particularly secondary school students and extremely usage of it results in mental and psychological disorders. Secondary school students are believed to be at a high risk with a marked increase in their internet usage worldwide [5]. However, overuse of the internet and of mobile phones is associated with problems for adolescents, whose physical health, social life and academic performance can be negatively affected [6, 7].

Worldwide, there was an estimate of 3.5 billion internet users. This means about 45 percent of the global population accessed the internet. Researches indicated that there may be as many as 2 million internet addicts, while other research suggests that the numbers may be even higher: between 1.4 and 17.9% of adolescents may be addicts. In South Korea, it is estimated that 4% of children have Internet Addiction Disorder (IAD) and Chinese estimates vary from 2-15%. In US, it is estimated that 1 in 8 adults suffer from IAD [8]. Many of these users of the internet and mobile phones are adolescents, who tend to rely on these technologies for entertainment more than adults do [9].

In Hong Kong it is estimated that 23% of youth who aged 10 to 19 years are internet users, while 18% of youth who aged 10 to 19 are smart phone users, with the high rate of social media use in this group (91%) occurring primarily via mobile phones [10].

The total number of worldwide internet users was estimated as 1.2 billion in the year 2000 and jumped to be 3.17 billion in 2015 [11]. According to the internet usage statistics, internet users are increasing in Egypt reaching about 54.6 % of the population in 2015, compared to 35.6% in 2012.3,4 more than 80% of the Egyptian internet café clients are young people [12]. This share is projected to grow to 60.8% in 2018. Egypt rate is getting closer to the global internet penetration rate which is estimated at 49.2%. Mobile subscribers have reached 110.06 million in September 2017. The telecommunication market in Egypt had two major events this year including the launch of 4G and “We” which is the 4th mobile operator [13, 14]. What's app is the most popular mobile messaging app in the world with one billion monthly active users. Facebook

Messenger closely follows with 900 million monthly active users. Facebook was found to be the leading social network with 1.7 billion active users. Other popular social networks include Instagram, Twitter and Tumblr, as well as mobile chat apps such as Face book Messenger or We Chat [15].

Heavy internet users are more likely to be engaged in the following health problems than others; eating unhealthy diet, poor nutritional intake, decreased physical activity levels and are more likely to be overweight - Body Mass Index (BMI >25) and having hypersomnia (>10 hours of sleep/day) [16]. Adolescents are more vulnerable to internet addiction than adults and the social performance, psychology and lifestyle habits of internet addicts can be affected by this addiction [8]. Many studies have reported that change in lifestyle factors caused by heavy internet use will lead to unfavorable effect on the growth and development of internet addicts [6-8]. It may lead to improper diet habits that end with malnutrition. So, teaching adolescents about proper nutrition and healthy eating habits are of great importance to grow and develop healthy.

Pediatric and community health nurses have a crucial role in establishing an effective path for the management of the internet addiction among adolescents as well as the daily problems that such condition raises. Their roles are not only in the assessment, diagnosis and treatment of internet addiction but in the prevention of this phenomenon as well [17].

Many researchers have studied the association between internet addiction and mental health problems, such as depression and psychiatric symptoms, among adolescents, but rare studies had been conducted to investigate the effects of internet addiction on life style pattern and the dietary behavior of adolescents [18]. Also, in spite of numerous studies that were done worldwide concerning internet addiction among adolescent school students, few studies were done in Egypt to address this problem, so the aim of the present study was to examine the effects of internet addiction on the life style and dietary behavior of secondary school students. This aim could be achieved through the following objectives:

- To determine the level of internet utilization among secondary school students.
- To describe the pattern of internet use among secondary school students.
- To investigate the negative effect of internet addiction on life style patterns, physical health, dietary behavior and social relations of secondary school students.

**MATERIAL AND METHODS**

**Research Design:** A descriptive correlational, cross-sectional design was adopted for this study, whereby all variables have been collected at the same point of time.

**Sample:** A total number of 800 secondary school students from both gender and from level 1 and 2 secondary grades, constitutes the sample of the current study. Their ages were from 16 to 18 years old. These students were selected from twelve governmental secondary schools in Port Said, Egypt, in the academic year 2017/2018. The total number of students is 2600. The least sample size was calculated using Epi-Info version 7.1.5.2. Program of statistics using 5% confidence limits at 99% confidence level was 787 students. For better accuracy and to cover any lost data due to incomplete questionnaires, 800 secondary school students were estimated to participate in the study.

**Method of Sample Selection:** A stratified random sample technique was used. Students were stratified by their educational years (secondary grades 1 and 2) and specialty (science and art) and the sample size from each stratum was proportionally allocated according to the number of students in each stratum. Students were selected randomly from each stratum until the minimum required sample size was fulfilled.

**Setting:** The study conducted at 12 governmental secondary schools at Port Saied, Egypt. The schools' names and number of students in each school were distributed as follow:

**Schools' Distribution:**

School name :	Students' no	%
1- Port Fouad female secondary school	116	14.5
2-Port Fouad male secondary school	62	7.8
3-Rofida al Ansaria female secondary school	122	15.2
4-Al-Sadat male secondary school	28	3.5
5-6 <sup>th</sup> October female secondary school	116	14.5
6-Al ghorfa al togaria female secondary school	62	7.8
7-Port said female secondary school	87	10.9
8-Alzhor female secondary school	50	6.2
9-Suez canal female secondary school	16	2.0
10-AL canal male secondary school	49	6.1
11-Al Nasr male secondary school	58	7.2
12-Port said elementary male secondary school	34	4.2

**Data Collection Tools:** The study instrument for data collection composed of a self- administered questionnaire with 2 sections:

**Section I:** Questions about internet use, it includes:

**Socio-Demographic and Academic Data of the Students:** It includes the personal characteristics of the students, as age, sex, residence, the educational level of the parents, ways of internet access, number of hours /day of internet use and Patterns of internet use and adverse effects of using internet.

**A Lifestyle Habit Questionnaire:** Was utilized to assess the regularity of bedtime, sleep disturbance and the use of tobacco. Also, assessment of dietary behavior of students was done, it included questions about: changes in meal size, appetite, eating speed, frequency of skipping meals and type of snacks.

**Section II: Internet Addiction Test (IAT):** This tool is used to assess problematic internet use and the level of internet addiction among students, which was originally developed by "Kimberly Young" <sup>(19)</sup> in 1998, to assess degree of internet addiction among youth. The scale consists of 20 items, which are rated on a five-point Likert scale that ranges from 1 to 5, in which 1 for (rarely), 2 for (occasionally), 3 for (frequently), 4 for (often) and 5 for (always). The total score of the scale ranging from (20-100). A score of (80-100) indicates excessive degree of internet addiction, while a score of (50-79) means moderate degree of internet addiction, while, a score of (20-49) indicates minimal degree of internet addiction (14). The split half reliability of this tool is 0.859 and Cronbach's Alpha is 0.902.

**Ethical Considerations:** Official permission was obtained from the directors of the educational zones that the schools were affiliated to. Verbal consent from all the study subjects was obtained after explanation of the aim of the study. All students informed that all data are confidential, their participation is voluntary and they can withdraw at any point during data collection.

**Statistical Analysis:** The data were coded, tabulated and analyzed using statistical package for social sciences (SPSS), software version 22.0 (IBM SPSS statistics for windows, released 2011; Data were analyzed using Stata® version 21 (Stata Corp LLC, College Station, TX, USA). Qualitative data were expressed as numbers and

percentages and the chi-square test was applied to test the relationship between variables. Pearson's correlation was applied to determine the relationship of the level of internet addiction and socio-demographic characteristics of the students and for the relationship of the level of internet addiction and the negative health effects of internet use. For each test, a p-value of less than 0.05 was considered statistically significant.

**RESULTS**

Figure (1): It shows that the study included 800 secondary school students, their mean age was 16.50±0.50 years. Female students (69.1%) represented higher percentage than males (30.9%). Also, more than half of the students (55%) were registered in the first grade of secondary level.

Figure (2): illustrates the degree of internet addiction among students, it indicates that more than half (54.7%) of students had low degree of addiction, while 42.8%, 2.5% of them had moderate and severe internet addiction respectively.

Table (1): illustrates the lifestyle pattern of the students, it shows that 43.6% of students had irregular bed time and more than two thirds of them (67.6%) didn't do any physical exercise. The majority of students (96.6%) were not smokers.

Regarding academic performance, Figure (3) indicates that less than half of the total sample (40.4%) had acceptable academic performance level.

Table (2): reveals that, (25%) of students had decreased their meal size, (26.9%) decreased their appetite, (40.4%) skipped breakfast and (45.8%) ate candy and ships as snacks.

Table (3): shows that students complained of weight loss, headache, fatigue and back pain (23.1%, 58.3%, 56% and 42.5%, respectively).

Table (4): illustrates the relation between socio-demographic characteristics of students and the level of internet addiction among the students. It was found that the highest percentage of severe level of internet addiction was among male students (52.4%) while, moderate and low degree of internet addiction were among females (36.6% and 25.8% respectively). There was a statistically significant relation between students' gender and age with their degree of IA (P= 0.001).

Table (5): this table shows that, there is a statistically significant relation between using mobile phones (as access to internet) and internet addiction ( $\chi^2=8.966$ ,  $p < 0.001$ ). Also there was a significant relation between the beginning age of using internet and internet addiction among students. The same table also indicates a significant relation between mean hours of using internet and severe internet addiction ( $F=85.928$ ,  $p < 0.001$ ).

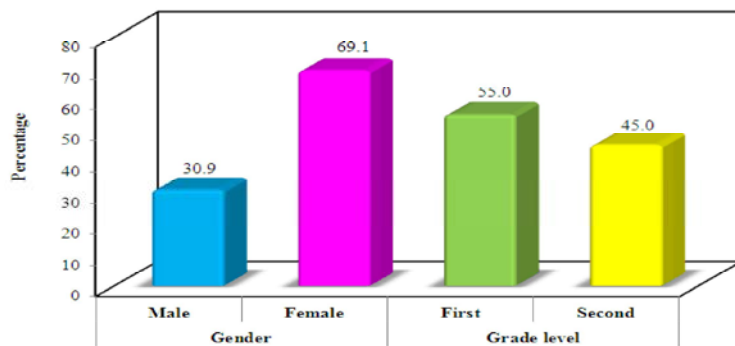


Fig. 1: Distribution of the students according to their gender and grade level

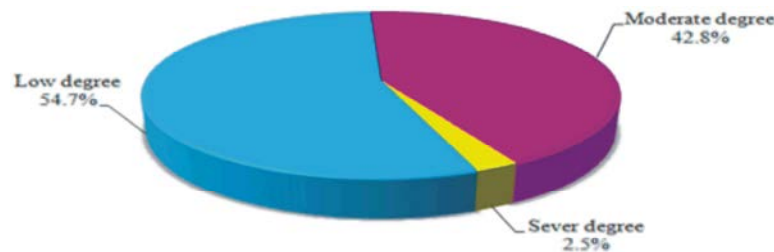


Fig. 2: The degree of internet addiction among students.

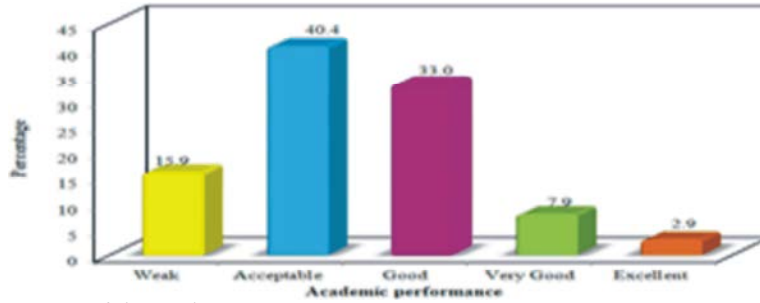


Fig. 3: Academic performance of the students

Table 1: Distribution of the students according to their lifestyle patterns

Variable	No	%
Bedtime		
Regular	227	28.4
Sometimes regular	224	28.0
Irregular	349	43.6
Sleep disturbance		
Yes	369	46.1
No	431	53.9
Physical exercise		
Yes	259	32.4
No	541	67.6
Tobacco use		
Yes	27	3.4
No	773	96.6
Good personal hygiene		
Always	626	78.3
Often	129	16.1
Frequently	26	3.3
Occasionally	17	2.1
Rarely	2	0.2

Table 2: Distribution of the students according to their dietary habits:

Variables	No	%
Changes in meal size:		
Increased	67	8.4
Decreased	200	25.0
No change	533	66.6
Changes in appetite:		
Increased	74	9.2
Decreased	215	26.9
No change	511	63.9
Changes in eating habits(speed)		
Fast	235	29.4
Slow	76	9.5
Average	489	61.1
Skipping breakfast		
Yes	477	59.6
No	323	40.4
Reasons for breakfast skipping *		
Oversleep	97	20.3
No appetite (no desiring)	188	39.4
Indigestion	18	3.8
Saving	58	12.2
Weight loss	34	7.1
Snacking before a meal	41	8.6
Lack of time	132	27.7
Habit	71	14.9

Table 2: Continued

Variables	No	%
Frequency of snacking		
1-	589	77.0
2-3	120	15.7
4+	56	7.3
Mean±SD		1.59±1.12
Snack items *		
Fast food	266	33.3
Carbonated beverages (Gaseous drink)	129	16.1
Candies and chips	366	45.8
Fruits and vegetables	192	24.0
Dairy products	46	5.8
Others	32	4.0

\*Responses are mutually exclusive

Table 3: Distribution of health problems related to internet use among students (n=800)

Variable	Yes		No	
	No.	%	No.	%
Weight loss	185	23.1	615	76.9
Weight gain	137	17.1	663	82.9
joint pain	259	32.4	541	67.6
Headache	466	58.3	334	41.8
Fatigue	448	56	352	44
Back pain	340	42.5	460	57.5
Eye strain	636	79.5	164	20.5
Feeling sad	180	22.5	620	77.5
Feeling (excited)	371	46.4	429	53.6
Anxious	286	35.8	514	64.3

Table 4: The relation between Sociol demographic characteristics of students and the degree of internet addiction (n=800)

Variable	Internet addiction			Test of significance
	Low degree	Moderate degree	Sever degree	
Gender				
Male	117 (25.8%)	119 (36.6%)	11 (52.4%)	$\chi^2=14.929$ , P= 0.001*
Female	337 (74.2%)	206 (63.4%)	10 (47.6%)	
Age				
16-	216 (47.6%)	177 (54.5%)	7 (33.3%)	$\chi^2=5.987^*$ p=0.049*
17-	238(52.4)	148(45.5)	14(66.7)	
Father education				
University	74 (16.3%)	67 (20.6%)	3 (14.3%)	$\chi^2=10.286$ , P= 0.244
Secondary education	231 (50.9%)	171 (52.6%)	12 (57.1%)	
Primary school	32 (7.0%)	26 (8.0%)	2 (9.5%)	
Read and write Illiterate	70 (15.4%) 47 (10.4%)	45 (13.8%) 16 (4.9%)	3 (14.3%) 1 (4.8%)	
Mother education				
University	34 (7.5%)	39 (12.0%)	1 (4.8%)	$\chi^2=15.766$ , P=0.044
Secondary education	202 (44.5%)	153(47.1%)	10 (47.6%)	
Primary school	40 (8.8%)	37 (11.4%)	3 (14.3%)	
Read and write	52 (11.5%)	40 (12.3%)	2 (9.5%)	
Illiterate	126 (27.8%)	56 (17.2%)	5 (23.8%)	
Number of siblings				
0-	32 (7.0%)	32 (9.8%)	3 (14.3%)	$\chi^2=9.476$ , P=0.149
2-	264 (58.1%)	198(60.9%)	9 (42.9%)	
4-	130 (28.6%)	69 (21.2%)	7 (33.3%)	
6+	28 (6.2%)	26 (8.0%)	2 (9.5%)	

$\chi^2$ : Chi square test, p value for association between different categories \*: Statistically significant at  $p \leq 0.05$

Table 5: The relation between Internet pattern used by students and the degree of internet addiction (n=800)

Variable	Internet addiction			Test of significance
	Low degree	Moderate degree	Sever degree	
Ways of Internet access *				
PC (personal computer)	113 (24.9%)	106 (32.6%)	8 (38.1%)	$\chi^2=2.275, p(0.321)$
Laptop	71 (15.6%)	78 (24.0%)	2 (9.5%)	$\chi^2=5.268, p(0.072)$
Mobile phone	399 (87.9%)	280 (83.2%)	19 (90.5%)	$\chi^2=8.966, p^*(0.011^*)$
Cyber	23 (5.1%)	27 (8.3%)	1 (4.8%)	$\chi^2=1.923, p(0.382)$
Beginning age of internet use	(n=454)	(n=325)	(n=21)	
Mean±SD.	10.13±2.44	10.91±2.67	10.43±2.50	F=24.144* p(<0.001*)
Mean±SD. of hours using the internet / day	3.73±3.01	7.15±4.72	9.31±5.42	F=85.928, p*(<0.001*)
What is your favorite sites *				
News	100 (22.0%)	65 (20.0%)	5 (23.8%)	$\chi^2=1.102, p(0.576)$
Social Media	370 (81.5%)	281 (86.5%)	20 (95.2%)	$\chi^2=0.419, p(0.811)$
the games	47 (10.4%)	44 (13.5%)	4 (19.0%)	$\chi^2=1.564, p(0.457)$
Other	69 (15.2%)	41 (12.6%)	4 (19.0%)	$\chi^2=1.707, p(0.426)$
Viewing sex pages				
Yes	55 (12.1%)	77 (23.7%)	8 (38.1%)	$\chi^2=23.922^* p(<0.001^*)$
No	399 (87.9%)	248 (76.3%)	13 (61.9%)	
Mean±SD. of hours viewing sex pages / week	1.88±0.33	1.76±0.43	1.62±0.50	F=12.658, p(<0.001*)

$\chi^2$ : Chi square test F: F for ANOVA test p: p value for association between different categories

\*: Statistically significant at  $p \leq 0.05$

Table 6: The relation between social relationships pattern and the degree of internet addiction among the students (n=800)

Variables:	Internet addiction			Test of significance
	Low degree	Moderate degree	Sever degree	
Good family relationship				
Yes	377 (83.0%)	201 (61.8%)	9 (42.9%)	$\chi^2=53.8,$
No	77 (17.0%)	124 (38.2%)	12 (57.1%)	$p = 0.000^*$
Good friends' relationship				
Yes	415 (91.4%)	268 (82.5%)	12 (57.1%)	$\chi^2=30.02$
No	39 (8.6%)	57 (17.5%)	9 (42.9%)	$p = 0.000^*$

$\chi^2$ : Chi square test p: p value for association between different categories \*: Statistically significant at  $p \leq 0.05$

Table 7: The correlation between Lifestyle pattern and academic performance with the degree of internet addiction among the students (N=800)

Variable	Internet addiction			Test of significance
	Low degree	Moderate degree	Sever degree	
Bedtime				
Regular	172 (37.8%)	55 (16.9%)	0 (0.0%)	$\chi^2=30.33$
Sometimes regular	140 (30.8%)	81 (24.9%)	3 (14.3%)	$p=0.000^*$
Irregular	142 (31.2%)	189 (58.1%)	18 (85.7%)	
Sleep disturbance				
Yes	149 (32.8%)	201 (61.8%)	19 (90.5%)	$\chi^2=81.292$
No	305 (67.2%)	124 (38.2%)	2 (9.5%)	$p=0.000^*$
Physical exercise				
Yes	159 (35.0%)	94 (28.9%)	6 (28.6%)	$\chi^2=3.361$
No	295 (65.0%)	231 (71.1%)	15 (71.4%)	$p=0.191$
Tobacco use				
Yes	11 (2.4%)	12 (3.7%)	4 (19.0%)	$\chi^2=17.180$
No	443 (97.6%)	313 (96.3%)	17 (81.0%)	$p=0.000^*$
Good personal hygiene				
Always	386 (85.0%)	229 (70.5%)	11 (52.4%)	$\chi^2=42.392$
Often	58 (12.8%)	65 (20.0%)	6 (28.6%)	$p=0.001^*$
Frequently	7 (1.5%)	17 (5.2%)	2 (9.5%)	
Occasionally	3 (0.7%)	12 (3.7%)	2 (9.5%)	
Rarely	0 (0.0%)	2 (0.6%)	0 (0.0%)	
Academic performance				
Excellent	9 (2.0%)	12 (3.7%)	2 (9.5%)	$\chi^2=25.130$
Very good	29 (6.4%)	34 (10.5%)	0 (0.0%)	$p=0.004^*$
Good	136 (30.0%)	118 (36.3%)	10 (47.6%)	
Acceptable	191 (42.1%)	124 (38.2%)	8 (38.1%)	
Weak	89 (19.6%)	37 (11.4%)	1 (4.8%)	

$\chi^2$ : Chi square test p: p value for association between different categories \*: Statistically significant at  $p \leq 0.05$

Table (6): This table displays that, students who had severe degree of internet addiction had poor social relationship with their families (57.1%) while, those who had moderate and low degree of internet addiction, had good social relationship with their families (38.2%and, 17.0%), with a highly statistically significant relation between them ( $\chi^2=53.8$ ,  $p = 0.000$ ).

Table (7): This table reveals the Lifestyle patterns of students based on their level of internet addiction. It was found that students with high percentage of severe and moderate degree of internet addiction, had irregular bed time and sleeping disturbances (85.7% and 58.1%), with statistically significant relation between them ( $P= 0.000$ ).

The table also shows that, students with all levels of internet addiction did not practice any physical exercise (71.4%, 71.1% and 65.0%).Also, there were statistically significant relationships between, smoking, personal hygiene and academic performance of students and internet addiction.

Table (8): This table points up that there is a high statistically significant relation between all items of dietary habits of students and their level of internet addiction ( $P= 0.000$ ).

Table 9: This table shows that there is a high statistically significant relation between all physical and emotional health problems that the students had and their level of internet addiction ( $P= 0.000$ ).

Table 8: The relation between Dietary habits of students and their degree of internet addiction (N= 800)

Variable	Internet addiction			Test of significance
	Low degree	Moderate degree	Sever degree	
<b>Changes in meal size</b>				
Increased	27(5.9%)	36(11.1%)	4(19.0%)	$\chi^2=49.437$
Decreased	79(17.4%)	113(34.8%)	8(38.1%)	$p=0.000^*$
No change	348(76.7%)	176(54.2%)	9(42.9%)	
<b>Changes in appetite</b>				
Increased	29(6.4%)	40(12.3%)	5(23.8%)	$\chi^2=54.231$
Decreased	87(19.2%)	120(36.9%)	8(38.1%)	$p=0.000^*$
No change	338(74.4%)	165(50.8%)	8(38.1%)	
<b>Changes in eating speed</b>				
Fast	83(18.3%)	142(43.7%)	10(47.6%)	$\chi^2=81.508$
Slow	33(7.3%)	42(12.9%)	1(4.8%)	$p=0.000^*$
Average	338(74.4%)	141(43.4%)	10(47.6%)	
<b>Skipping breakfast</b>				
Yes	254(55.9%)	208(64.0%)	15(71.4%)	$\chi^2=6.350$
No	200(44.1%)	117(36.0%)	6(28.6%)	$p=0.044^*$
<b>Reasons for breakfast skipping *</b>				
Oversleep	35(13.6%)	58(27.0%)	4(25.0%)	$\chi^2=34.091$
No appetite	120(46.5%)	66(30.7%)	2(12.5%)	$p=0.001^*$
Indigestion	11(4.3%)	6(2.8%)	1(6.2%)	
Saving	29(11.2%)	29(13.5%)	0(0.0%)	
Weight loss	17(6.6%)	17(7.9%)	0(0.0%)	
Snacking before a meal	17(6.6%)	23(10.7%)	1(6.2%)	
Lack of time	62(24.0%)	62(28.8%)	8(50.0%)	
Habit	39(15.1%)	28(13.0%)	4(25.0%)	
<b>Frequency of snacking</b>				
1-	358(83.3%)	224(71.1%)	7(35.0%)	$\chi^2=40.900^*$
3-	53(12.3%)	61(19.4%)	6(30.0%)	$p=0.000^*$
5-7	16(3.7%)	29(9.2%)	7(35.0%)	
7	3(0.7%)	1(0.3%)	0(0.0%)	

$\chi^2$ : Chi square test \*: Statistically significant at  $p \leq 0.05$



Table 9: The relation between Physical and emotional health problems of students and their degree of internet addiction (N=800):

Variable	Internet addiction			Test of significance
	Low degree	Moderate degree	Sever degree	
Weight loss				
Yes	79 (17.4%)	100 (30.8%)	6 (28.6%)	$\chi^2=19.401$
No	375 (82.6%)	225 (69.2%)	15 (71.4%)	$p=0.000^*$
Weight gain				
Yes	49 (10.8%)	83 (25.5%)	5 (23.8%)	$\chi^2=29.697$
No	405 (89.2%)	242 (74.5%)	16 (76.2%)	$p=0.000^*$
joint pain				
Yes	105 (23.1%)	141 (43.4%)	13 (61.9%)	$\chi^2=44.090$
No	349 (76.9%)	184 (56.6%)	8 (38.1%)	$p=0.000^*$
Headache				
Yes	221 (48.7%)	231 (71.1%)	14 (66.7%)	$\chi^2=39.702$
No	233 (51.3%)	94 (28.9%)	7 (33.3%)	$p=0.000^*$
Fatigue				
Yes	202 (44.5%)	232 (71.4%)	14 (66.7%)	$\chi^2=56.584$
No	252 (55.5%)	93 (28.6%)	7 (33.3%)	$p=0.000^*$
Back pain				
Yes	144 (31.7%)	181 (55.7%)	15 (71.4%)	$\chi^2=51.934$
No	310 (68.3%)	144 (44.3%)	6 (28.6%)	$p=0.000^*$
Eye strain				
Yes	326 (71.8%)	292 (89.8%)	18 (85.7%)	$\chi^2=38.334$
No	128 (28.2%)	33 (10.2%)	3 (14.3%)	$p=0.000^*$
Feeling sad				
Yes	92 (20.3%)	84 (25.8%)	4 (19.0%)	$\chi^2=3.532$
No	362 (79.7%)	241 (74.2%)	17 (81.0%)	$p=0.176$

$\chi^2$ : Chi square test p: p value for association between different categories\*: Statistically significant at  $p \leq 0.05$

## DISCUSSION

The use of computers and the internet had led to a series of dramatic changes and developments in the ways of generating, storing and sharing knowledge. Teenagers of today find internet and computer as their basic necessities; otherwise they will get behind in this age. There is no doubt that internet has been a good source of communication and learning if used carefully, otherwise it may cause physical and mental disorders among users which is known as internet addiction [20]. The aim of the current study was to examine the effects of internet addiction on the life style and dietary behavior of secondary school students.

As regard to the general characteristics of students, the current study had shown that the total number of students was 800 secondary school students, from grades 1 and 2. They were from 12 governmental secondary schools at Port Said, Egypt. Students' age was between 16 and 17 years with a mean age of  $16.50 \pm 0.50$  years. Findings showed that 30.9% of students were males and 69.1% of them were females.

Regarding the level of internet addiction, the results had shown that nearly half (42.8%) of the participants had moderate internet addiction and 2.5% of them had severe internet addiction. This finding was in agreement with a study conducted by Goel, *et al.* [21] on 987 students of various faculties across the city of Mumbai, India and found that 74.5% participants were moderate addicted and 0.7% participants were severely addicted to internet. Another study by Chauhan *et al.* [20], who conducted their study on 52 randomly selected adolescents from private school of Haridwar, Uttarakhand, India and found that more than half (53.8%) of the participants had moderate internet addiction and 7.7% of them had severe internet addiction. These similarities in results may be due to that widespread use of the Internet among the adolescents makes them spend more time on it, which leads to moderate to severe degree of addiction.

Also, the results indicated that there is a significant relationship between socio-demographic characteristics of the students and their level of internet addiction (Table 4); the highest percentage of severe level of internet addiction is found among male students, those

students' mothers were having secondary education level. The highest percentage of both moderate and low degree is found among female sample. These findings were in agreement with a study done by Hosseini [22], who reported that the internet addiction was higher in male students than in females.

In same direction, a study done by Yajun *et al.* [23], who conducted their study about the prevalence of Internet addiction in a nationally representative sample of Chinese elementary and middle school students, to investigate Internet addiction among students with different Internet usages. It was found that the prevalence of Internet addiction in the total sample was 6.3% and among Internet users was 11.7%. Among the internet users, males (14.8%) reported Internet addiction more than females (7.0%). On other hand, a study done by Al-hantoushi and Al-abdullateef [24] showed that the internet addiction level in women is more than that in men, however, the study results about internet addiction prevalence among the students suggested that 52.4% girls and 47.6 % boys suffer from IA. This could be explained because males are more likely to use the internet more than females to satisfy other addictions such as gambling and gaming.

Regarding internet pattern used by students and its relation with the level of internet addiction, it was found that all students who are addicted to internet had accessed internet through mobile phones (Table 5). They spent more than 9 hours using the internet. A study done by Tahiroglu *et al.* [25] who conducted their study on Turkish adolescents. The Participants were 3,975 undergraduate students. It was found that 7.6% of students reported using the Internet for more than 12 hours per week. This finding is consistent with existing literature, so parents and teachers should monitor and guide the Internet activities of adolescents to prevent them from developing problematic internet usage that leads to IA.

The current study also had revealed a significant relation between degree of IA and students' life style pattern, sleeping disturbance, academic performance and social relationships with their friends and family (Tables 6 &7). According to Anderson *et al.* [26], it was reported that internet addiction negatively affected life routines, health, academic performance and parental relationship in relation to their occurrence. In the same line with the previous results, Kodvanji *et al.* [27] conducted a study to investigate the impact of internet use on lifestyle of undergraduate medical students in India. This cross-sectional study involved

90 (18-20 years) undergraduate medical students. The two groups addictive and non-addictive to internet were compared for environmental stressors and lifestyle factors such as sleep, dietary habits, physical activities and academic performance. The addictive internet user group had a statistically significant impairment of sleep and excessive day time sleepiness, poor dietary habits and presence of environmental stressors when compared to the non-addictive internet user group.

Another study by Anwar [28] who tried to examine the prevalence of internet addiction among secondary school children and its relationship with their academic achievements. The study conducted on 300 male and female students from government and private schools of Lucknow city, India. It was found that, students who were extremely high internet usage had a negative impact on their academic achievement.

Another study by Upadhayay *et al.* [29] who performed their study on one hundred medical students (male: 50, female: 50), aged 17-30 years to compare the Internet addiction levels between male and female medical students. It was reported that; the purpose of internet use varied among the students, as most of the students, the main priority was for downloading and watching movies and songs (76%). Few students (24%) used the internet in improving their educational and learning activities. Some students mentioned that they had experienced poor academic progress and lack of concentration due to overuse of the internet at night time, as they spent a minimum of 3-4 hours daily on the Internet.

In the same line with our findings, Sharma *et al.* [30] who conducted their study on 400 professional course students from 15 to 25 years of age group in Jabalpur city of Madhya Pradesh, India. It was found that males were more addicted to internet than females and they were socially isolated from family and friends. Widespread use of the Internet among the adolescents makes them feel alone, causes problematic behaviors and leads to poor family and friends relationships. Kamal and Mosallem [31] also stated that problematic internet users (PIUs) cut themselves off from their family, friends and social activities and choose to spend most of their time alone. The same results had been reported by Yellowlees *et al.* [32] who mentioned that excessive and morbidly use of the internet, will lead to more psychological & pathological disorders compared with those lacking such experience.

In the present study it was found that there is a significant relation between IA and different health problems among students (Table 9). This finding was

supported by many studies, as Saied *et al.* [11] who conducted their study to determine prevalence, associated factors and effects of internet and Face book addiction on medical students of Tanta faculty of medicine, Tanta University, Egypt, on 861 Egyptian and Malaysian students at 4<sup>th</sup> and 5<sup>th</sup> medical year. The most frequently reported adverse effects of internet and face book usage were headache, eye irritation and musculoskeletal pain. These results were similarly reported by many other authors [33-35].

### CONCLUSION

Based on the study results, it was concluded that; internet addiction is growing problem among secondary school students, which has negative effects on their lifestyle, dietary behavior, social relations and academic performance, physical and social health. It was found also that there is a significant relation between severe internet addiction among students and poor lifestyle pattern, long hours spent on internet, lacking physical activity, poor dietary habits, moderate academic performance, disturbing sleeping pattern and physical health problems such as headache (58.3%), Wight loss (23.1%), joint pain (32.4%), eye strain (79.5%) and back pain (42.5%).

**Recommendations:** Based on the study results, it was recommended that:

- School and pediatric health nurses should educate adolescent students about: a healthy lifestyle that they should follow, a balanced diet and optimum physical activity routine, which are needed to remain healthy and grow normally.
- School and pediatric health nurses should take an active role in designing and implementing internet addiction prevention health programs to raise school aged students' awareness regarding the adverse effects of Internet addiction on adolescents' development because of poor dietary behavior they follow.
- School health nurses must offer counseling to all students about how to utilize internet network within safety limits and close attention should be paid to students at risk of Internet addiction.
- Close supervision from parents and school teachers must be offered to students to control their use of internet to ensure healthy and safe use of the Internet and to prevent complications of internet misuse and addiction as early as possible.

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