
	Contents lists available at www.innovativejournal.in INTERNATIONAL JOURNAL OF NURSING DIDACTICS Homepage: http://innovativejournal.in/index.php/ijnd	 ISSN: 2231-5454
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The Effect of Internet Addiction on the Executive Functions and Communication Skills among University Nursing Students

¹ Shaimaa Mohamed Nageeb, ² Nouf Mehajaa Mharb Al Enzi

¹ Lecturer of Mental Health Nursing, Faculty of Nursing, Zagazig University, Egypt

² Lecturer of Maternal and Child Health Nursing Department, Faculty of Nursing, Hail University, Saudi Arabia

DOI: <https://doi.org/10.15520/ijnd.v10i02.2803>

Abstract: Background: In this era of technology, Internet use has tremendously increased worldwide. There are growing concerns about internet addiction among university students; hence, the students' pattern of use can adversely affect their executive functions and communication skills. **Aim of the study:** This study aimed to examine the effect of internet addiction on executive function and communication skills among university nursing students. **Research Design:** a descriptive, correlational study design. **Study Setting:** The study conducted in the college of nursing at Zagazig University, Egypt. **Study Sample:** A Convenience sample of (300) nursing students. **Tools of data collection:** Three tools utilized; namely, Internet addiction Test (IAT), Executive functioning scale. And Communication skill evaluation scale. **Results:** The findings of this study showed that (41%) of nursing students had moderate level of internet addiction, (44.7%) of studied nursing students had low level of communication skills while (42 %) of them had moderate level and (66%) of studied nursing students had moderate level of executive functions in addition to there was a negative highly statistically significant correlation between nursing students' total score of internet addiction, communication skills, and executive functions. **Conclusion:** The study concluded that there highly statistical negative correlation between nursing students' total scores of internet addiction, communication skills, and executive functions. **Recommendations:** Implementing more effective intervention programs for the vulnerable group of Internet addiction.

Keywords: Internet Addiction, Executive Function, Communication Skills. University Nursing Students

INTRODUCTION

In recent years, Internet usage has grown significantly throughout the world. It considered an important method for education, communication, and information sharing. benefits provided by this communicative device is the improvement of human life; However, the inappropriate usage of this device could result in undesirable consequences, such as Internet addiction which has turned into an emerging, significant concern for mental health in several countries. Internet Addiction may disturb the family and the social life of their addicted users, as well as their educational or job-related performance (Ranjbar & Bakhshi, 2018).

Lately, Kuss & Pontes (2019) well-defined the phenomenon as a behavioral pattern involving the experience of dysfunctional craving regarding internet use for periods without self-regulation by the individual, resulting in significant psychological, social, and functional damages. That is, the internet-dependent individual spends a considerable time daily on online activities that are not essential, developing a distancing from social contacts outside the Internet, a distortion of their personal goals, interests and a loss of academic and/or professional performance.

Internet addiction has emerged as a universal issue, but its international estimates vary hugely. (Wang, Wu & Lau, 2016). Internet addiction disorder is also termed as the "internet overuse" and "pathological computer use". Excessive computer use disrupts everyday life. The

"overuse" and "excessive use" of the internet usually indicate that the time online is an important index for determining internet addiction. (Information Security Education and Awareness, 2013).

The World Internet Users Statistics reported that the number of persons who used the internet actively, especially adolescents and young people, had grown from 2.5 billion persons in 2014 to 3.7 billion persons in 2017. Furthermore, in 2017, 56.7% of the Middle East population are active internet users who represented 3.8% of internet users worldwide (Internet World Stats., 2014:2017). A multinational meta-analysis showed that 6% of people worldwide have an internet addiction, ranking the Middle East in first place with 11%, while northern and western Europe were ranked the lowest with 3%. (Cheng and Li 2014). In addition, internet addiction prevalence was 2.6% among adolescents in El-Minia, Upper Egypt, while the prevalence of potential Internet addiction was 18.2% (Kamal and Mosallem 2013). Another study conducted among adolescents recruited from private and governmental schools in Cairo, Egypt, revealed a prevalence of 0.8%. (Reda, Rabie, Mohsen, & Hassan 2012).

Abdel-Salam et al., (2019) stated that university students were thought to be at a hazardous risk to excessive Internet use worldwide. Internet addiction among these students was established to be associated with different psychiatric disorders such as depression, stress, anxiety, low self-respect, and low psychosomatic well-being.

Learning and academic performance require a student to invest and apply a range of cognitive resources. Executive function skills—a generic ability to deliberately organize and act on information to attain planned goals—suggested constituting one such fundamental. Executive function skills believed to be the foundations of students’ understanding and to be responsible for students’ different responses to the teacher’s instruction (Nyroosa et al., 2018).

Romero-López., Pichardo, Ingoglia, & Justicia, (2018), defined executive function as the set of higher-order cognitive processes that allow control of behaviors essential to learning and carrying out tasks, and contribute to the supervision and regulation of these behaviors. Furthermore, they do not only influence the control exercised by executive function in the cognitive field, but also socio-emotional and behavioral domains. Because internet addiction disorder belongs to the compulsive-impulsive spectrum of disorders, it presents cognitive bias and executive functioning deficit characteristics of some types of disorders. (Chhabra and Anand 2013).

Buelow, Okdie, & Cooper (2015), indicated that executive functions refer to higher-order cognitive abilities knotted to the frontal lobes of the brain and embrace such abilities as planning, organization, set-shifting, problem-solving, working memory, and decision making. Executive function skills are measured through the three discrete skills: working memory (or sometimes, in particular, updating), inhibitory control, and cognitive flexibility, working memory is the skill of holding information in mind, manipulating it and then using it in a goal-directed fashion. Updating, a sub-function of working memory, comprises observing and properly adjusting the contents of working memory in light of changing circumstances. Inhibitory control, occasionally named impulse control, includes ignoring distractors and preventing a dominant, or pre-potent, the response in favor of a less impulsive, more goal-directed one. Cognitive flexibility, sometimes called set-shifting, is the skill involved in being capable to shift between two (or more) rule sets or to think about things differently. Together, these executive function skills allow for the top-down (cognitive) regulation of attention, thoughts, and actions. (Semenov and Zelazo 2019).

Nafee, Mohammed and Al-Hamdan (2018) emphasized that the users of the internet should be aware of its positive and negative effects on their physical and psycho-social status, in spite of the various advantages of this technology as positive influences of the internet use of teenagers’ cognitive abilities, creativity, develop their socialization, communication, problem-solving, critical thinking skills in addition to enhancing language development, verbal and non-verbal skills, self-concept and used as a means to deal with stress.

Nursing students are prospective healthcare professionals who will provide care for people to promote physical, psychological, mental and spiritual health. For nurses, communication skills are a tool to be used for therapeutic purposes in nursing practice. Nurses’ therapeutic communication is significant, as it enables interaction through an exchange of verbal and nonverbal

communication for education, prevention, support and correction (Doh, 2016). Communication is an important and integral part of life; without it, no one might survive. Verbal and non-verbal communication starts from birth and does not end until death (Vertino, 2014). Communication has been defined by many as the exchange of information, feelings, and thoughts among people (Lambrini and Loanna, 2014).

In addition, communication is a significant attribute in nursing and a medium through which information, in the context of “care” is conveyed. Nurses convey nursing care to patients verbally (thorough speaking) and non-verbally (acting, showing, touching, doing, etc). (Ennis et al., 2013). According to Bello (2017), the nursing practice requires not only scientific knowledge but an additional effective interpersonal communication, intellectual and technical abilities, and skills. For the success of a student’s future career, communication skills are indispensable.

Erginsoy, (2019), stated that internet addiction problems arising from some reasons listed, it is generally agreed that the need for socialization, initiation, and maintenance of social relations is the main reason. Being able to communicate meets some psychological and social needs. Internet is increasingly becoming the primary means of communication among youth, however, they have a negative impact on the communication skills of young people. As technological advancements are made, the residual impact of social networking on society’s youth is significant to researchers in the field of social work and if ignored, the lack of skills to effectively communicate and resolve conflicts in a person may negatively affect behavior and impair one’s ability to develop and maintain relationships. Studies reveal that excess use of the internet and social media may inhibit proper interpersonal skill development (Drussell, 2012). Another study showed that individuals with internet addiction present cognitive biases toward information related to Internet gaming and poor executive functioning skills (lower mental flexibility as well as response inhibition) (Zhou et al., 2012). Also, Studies on neuroimaging indicated that individuals with internet addiction present executive dysfunctions including attentional selections and decision-making (Pawlikowski and Brand, 2011; Dong et al., 2013b).

Ikachoi, Mberia, and Ndati (2015). argue that online contacts are superficial with weak-tie relationships that lack feelings of affection and commitment. This ends up reducing the quality of relationships and well-being and although social media appear more attractive, they are ultimately a leaner and less satisfying medium of human interaction which increases loneliness and also affects cognitive and executive functioning

Significance of the Study:

According to internet usage statistics, internet users are increasing in Egypt. There were about 49 million users (48.7 % of the population) in 2019 (Internet world status. Egypt Internet Usage and Telecommunications Report, 2019), compared to 12.8 million in 2008 [World Economic Forum, 2008]. More than 80% of the Egyptian internet café customers are younger people (United Nations Development Programme (UNDP) & Institute of

National Planning (INP), 2010). Other studies were carried out in Zagazig-University to address the problematic internet usage problem. **Abdelghani et al., (2018)** reported that the prevalence of the internet use-related problems, among undergraduate students at Zagazig University, was 41.5 %. The frequency of at-risk internet use and internet addiction was estimated to be 37.4% and 4.1%, respectively. Also Among ZU students, 81.2% was the prevalence of Facebook use, 9.7% was the prevalence of internet addiction 45.3% potentially addicted (**Ahmed and Amer 2015**). Therefore, this study carried out to examine the effect of internet addiction on executive functions and communication skills among university nursing students.

Aim of the Study:

This study aimed to examine the effect of internet addiction on executive functions and communication skills among university nursing students.

Research questions:

1. To what extent-nursing students have internet addiction?
2. What is the nursing students' level of communication skills?
3. What is the nursing students' level of executive functions?
4. Is there a relationship between nursing students' internet addiction, communication skills, and executive functions?

SUBJECT AND METHODS

Technical Design:

The technical design includes study design, study setting, subjects and tools of data collection.

Research Design:

A descriptive Correlational design used to achieve the aim of the present study. Descriptive correlational research is usually employed when it is needful to explore the relationships between variables in a research project and is a useful design in measuring the extent of the relationship between two variables (**“Correlational Research Overview,” 2019**).

Research Setting:

This study carried out in the Faculty of Nursing at Zagazig University, Egypt.

Sample:

The study sample included nursing male and female students from fourth academic grades in academic year 2018/2019 and formerly registered in the faculty of nursing and studied

Sample Type:

A convenience sample used to collect data from undergraduate nursing students studying at nursing college affiliated to the faculty of nursing at Zagazig University, Egypt.

Sample Size:

It consisted of 300 undergraduate nursing students out of 521.

Tools of the Study:

The data for this study collected by using three tools namely: Young internet addiction test, Executive functioning scale, and Communication skill evaluation scale

First tool: Young internet addiction test (YIAT):

It consisted of two parts as the following:

Part I: personal characteristics of nursing students as (Academic GPA, Gender) and internet using the information as (Uses of internet for study, places of internet and most common internet sites).

Part II: Young internet addiction test (YIAT): The Arabic version of the Internet Addiction Test (IAT) was administrated to measures different levels of internet addiction among nursing students. Originally, an Internet Addiction Test was designed by **Young (1995)**. And the Arabic version of the internet addiction test has been developed by **Hawi (2013)**. It is a self-rated test that contains 20 items.

Scoring system:

Nursing students' responses scored on six points Likert scale ranging from 0 indicating “Does not apply” and 5 indicating “always”. A three categorical score was given to describe the level of Internet addiction as following: a score of 20-49 suggests controlled or average usage (mild addiction), a score of 50-79 suggests occasional or frequent problems (moderate addiction); and a score of 80-100 suggests significant problems (severe addiction).

Reliability of this tool:

The reliability of the tool measured through assessing its internal consistency which used the Cronbach alpha coefficient and it was 0.92.

Second Tool: Executive functioning scale – short form-inventory Scale:

It was developed by **Barkley (2011)**. To assess nursing students' executive function deficit levels. This measure consists of 20 items, which measure five dimensions distributed as follows;

Self- Management to Time (4 items, e.g., “Procrastinate or put off things until the last minute, etc.), Self-Organization/ Problem Solving (4 items, e.g., “Have trouble learning new or complex activities as well as others, etc.), Self-Restraint (4 items, e.g., “Unable to inhibit my reactions or responses to events or others, etc.), Self-Motivation (4 items, e.g., “Do not put as much effort into my work as I should or than others are able to do, etc.), and Self-Regulation of Emotions (4 items, e.g., “Have trouble calming myself down once I am emotionally upset, etc.).

Scoring system:

Nursing students' responses scored on four points Likert scale ranging from Never or rarely (1) to very often (4). Total scores of nursing students regarding executive functioning level ranged from 20-80 and classified as follows; low <60%, moderate 60-75%, and high >75%.

Reliability of this tool:

The reliability of the tool measured through assessing its internal consistency which used the Cronbach alpha coefficient and it was 0.86.

Third Tool: Communication skill evaluation scale:

It was developed by **Barkman and Machtmes (2002)**. To assess nursing students' ability to communicate by examining the frequency of use of the following skills that needed to use effective communication practices. This measure consists of 23 items (e.g., "I use my tone of voice to reinforce what I am trying to say").

Scoring system:

Nursing students' responses scored on five points Likert scale ranging from Never (0) to always (4). Total scores of nursing students regarding communication skills level ranged from 0 to 92 and classified as follows; low <60%, moderate 60-75%, and high >75%.

Reliability of this tool:

The reliability of the tool measured through assessing its internal consistency which used the Cronbach alpha coefficient and it was 0.94.

Operational Design:

The operational design for this study included three stages; preparatory phase, pilot study, and fieldwork.

Preparatory Phase:

This phase started from the beginning of January to February 2019. It included the following: Reviewing the national and international related literature using journals, periodicals, textbooks, internet and theoretical knowledge of the various aspects concerning the topic of the study. The tools translating into Arabic language and back translation to check its accuracy. Tools validity: The tools' contents were developed and tested for its content and face validity through a jury of five academic staff in mental health nursing departments from different faculties of nursing in Egypt namely; Zagazig faculty of nursing, Cairo faculty of nursing, Banha faculty of nursing and Helwan faculty of nursing. The validity of the tools aimed to judge its clarity, simplicity, accuracy, comprehensiveness, and relevance. All items were reviewed and accepted by the jury committee.

Pilot Study:

The pilot study was carried out in March 2019 and conducted on about 10% of the total sample (30 nursing students). The pilot study aimed to examine the sequence of items, feasibility, practicability, and applicability of the tools, clarity of the language and for estimating the time needed to fill it. The tools were finalized based on the result of the pilot study. As well as the pilot study, participants were included in the study because no modification was done in the study tools.

Field Work:

Data collection took about one month started from the beginning to the end of April 2019 with a visiting setting. The researcher met nursing students and explained the aim and the nature of the study and the method of filling the questionnaire. This done individually or through group meetings. The researcher distributed the questionnaire sheets to the nursing students to fill it in work times, the time

required to fill the questionnaires sheet was a range from 5 to 10 minutes for Internet addiction Test, from 5-10 minutes for Barkley Deficits in Executive Functioning Scale and 10-15 minutes for communication scale. The filled forms were collected in time and revised to check their completeness to avoid any missing data. The data collection was for 3 days/week.

Administrative Design:

Permission to conduct the study was obtained from the dean of the faculty of nursing at Zagazig University after explaining the aim of the study.

Ethical Considerations:

Oral informed consent obtained from the participants. They informed about their rights to refuse or withdraw from the study with no consequences. They reassured about the anonymity and confidentiality of the information collected, and it used only for the purpose of scientific research. No harmful maneuvers performed or used and no foreseen hazards anticipated from conducting the study on participants.

Statistical Design:

Statistical analysis was done by using the IBM SPSS version 22 statistical software package. Followed by data analysis and tabulation. Data were presented using descriptive statistics like the number, frequency, and Pearson correlation coefficients (r). A significance level value was considered when p-value ≤ 0.05, while p-value > 0.05 indicates non- significance results.

RESULTS

Table (1): Distribution of personnel characteristics of the studied students (n=300).

personnel characteristics	No	%
Academic Grade		
Excellent	54	18.0
Very good	108	36.0
Good	60	20.0
Pass	78	26.0
Gender		
Male	116	38.7
Female	184	61.3
Uses of internet for study		
Yes	238	79.3
No	62	20.7
Places for internet		
Home	230	76.7
Internet clubs	62	20.7
Others	8	2.6
Most common internet sites		
Gathering information	28	9.3
Chatting	142	47.3
Sending/receiving e-mails	32	10.8
Playing games	94	31.3
Others	4	1.3

Table 1 showed that the personal characteristics of the studied nursing students, where the total number of nursing

students was 300 from the faculty of nursing at g Zagazig University. Concerning their academic grade, more than one-third of them (36%) have a very good grade. Regarding their gender, about two-thirds of them were females (61.3%). Regarding students' usage of the internet for

studying, the majority of both of them (79.3%) use the internet for studying. Regarding the places for the internet, more than three-quarters of both of them (76.7%) uses the internet at home. Concerning most common internet sites (47.3%) of them uses the internet for chatting.

Table (2): Distribution of internet addiction among the studied students (n=300).

internet addiction	Never		Rarely		Sometimes		Often		Usually		Always	
	No	%	No	%	No	%	No	%	No	%	No	%
1. Do you feel that you stay online longer than you intend?	82	27.3	50	16.7	28	9.3	66	22.0	22	7.3	52	17.4
2. Do you neglect household chores to spend more time online?	22	7.3	38	12.7	62	20.7	110	36.7	22	7.3	46	15.3
3. Do you prefer the excitement of the Internet to intimacy with your partner?	34	11.3	48	16.0	44	14.7	90	30.0	34	11.3	50	16.7
4. Do you form new relationships with fellow online users?	38	12.7	44	14.7	66	22.0	66	22.0	24	8.0	62	20.7
5. Do others in your life complain to you about the amount of time you spend online?	40	13.3	66	22.0	34	11.3	72	24.0	30	10.0	58	19.4
6. Does your work suffer because of the amount of time you spend online?	38	12.7	74	24.7	40	13.3	76	25.3	44	14.7	28	9.3
7. Do you check your email before something else that you need to do?	38	12.7	68	22.7	68	22.7	66	22.0	48	16.0	12	4.0
8. Does your job performance or productivity suffer because of the Internet?	20	6.7	104	34.7	66	22.0	60	20.0	18	6.0	32	10.7
9. Do you become defensive or secretive when someone asks what you do online?	28	9.3	76	25.3	50	16.7	84	28.0	28	9.3	34	11.4
10. Do you block disturbing thoughts about your life with soothing thoughts of the Internet?	30	10.0	58	19.3	44	14.7	76	25.3	52	17.3	40	13.4
11. Do you find yourself anticipating when you go online again?	66	22.0	50	16.7	34	11.3	78	26.0	24	8.0	48	16.0
12. Do you feel that life without the Internet would be boring, empty, and joyless?	52	17.3	42	14.0	52	17.3	74	24.7	52	17.3	28	9.4
13. Do you snap, yell, or act annoyed if someone bothers you while you are online?	54	18.0	20	6.7	50	16.7	62	20.7	52	17.3	62	20.7
14. Do you lose sleep due to late night log-ins?	34	11.3	44	14.7	46	15.3	60	20.0	84	28.0	32	10.7
15. Do you feel preoccupied with the Internet when offline or fantasize about being online?	24	8.0	42	14.0	46	15.3	84	28.0	66	22.0	38	12.7
16. Do you find yourself saying "just a few more minutes" when online?	44	14.7	32	10.7	44	14.7	82	27.3	44	14.7	54	18.0
17. Do you try to cut down the amount of time you spend online and fail?	30	10.0	34	11.3	60	20.0	96	32.0	36	12.0	44	14.7
18. Do you try to hide how long you have been online?	38	12.7	34	11.3	50	16.7	84	28.0	58	19.3	36	12.0
19. Do you choose to spend more time online over going out with others?	52	17.3	38	12.7	66	22.0	66	22.0	50	16.7	28	9.3
20. Do you feel depressed, moody, or nervous when you are offline, which goes away once you are back online?	40	13.3	58	19.3	52	17.3	64	21.3	54	18.0	32	10.8

Table 2 illustrated that the highest percentage (20.7%) reported of internet addiction among nursing students was concerning forming new relationships with fellow online users and (19.4%) regarding the others in their life complain

about the amount of time you spend online while the lowest percentage reported (4%) was regarding checking their email before something else that you need to do

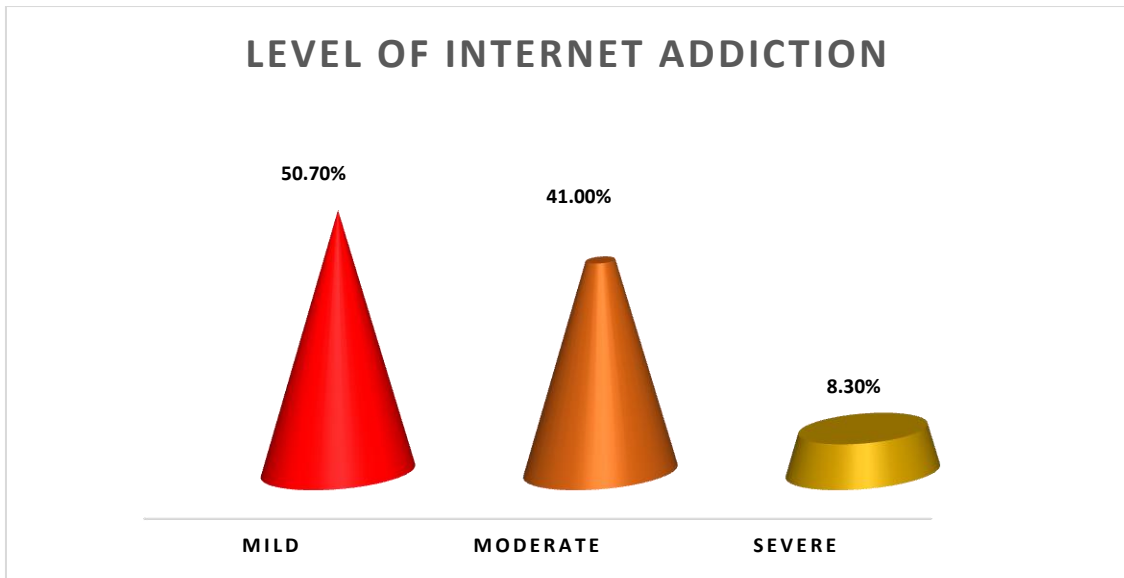


Figure (1): Total score of internet addiction among nursing students.

Figure (1) Portrayed that more than two-fifths of students (41%) had a moderate level of internet addiction while slightly more than half of them had a low level of internet addiction.

Table (3): Distribution of executive function among the studied students (n=300).

executive function	Rarely		Sometimes		Often		Always	
Self- Management to Time								
1. Procrastinate or put off things until the last minute	58	19.3%	116	38.7%	52	17.3%	74	24.7%
2. Can't seem to hold in mind things I need to remember to do	56	18.7%	110	36.7%	90	30.0%	44	14.6%
3. Not motivated to prepare in advance for things I know I am supposed to do	60	20.0%	128	42.7%	80	26.7%	32	10.6%
4. Have trouble doing what I tell myself to do	74	24.7%	106	35.3%	74	24.7%	46	15.3%
Self-Organization/ Problem Solving								
5. Have trouble learning new or complex activities as well as others	82	27.3%	102	34.0%	80	26.7%	36	12.0%
6. Have difficulty explaining things in their proper order or sequence	60	20.0%	114	38.0%	74	24.7%	52	17.3%
7. Unable to "think on my feet" or respond as effectively as others to unexpected events	74	24.7%	92	30.7%	90	30.0%	44	14.6%
8. I don't seem to process information as quickly or as accurately as others	70	23.3%	90	30.0%	90	30.0%	50	16.7%
Self-Restraint								
9. Unable to inhibit my reactions or responses to events or others	82	27.3%	110	36.7%	64	21.3%	44	14.7%
10. Make impulsive comments to others	70	23.3%	94	31.3%	96	32.0%	40	13.4%
11. Likely to do things without considering the consequences for doing them	76	25.3%	108	36.0%	74	24.7%	42	14.0%
12. Fail to consider past relevant events or past personal experiences before responding to situations (I act without thinking)	76	25.3%	88	29.3%	70	23.4%	66	22.0%
Self-Motivation								
13. Do not put as much effort into my work as I should or than others are able to do	84	28.0%	100	33.3%	84	28.0%	32	10.7%
14. Others tell me I am lazy or unmotivated	66	22.0%	100	33.3%	88	29.3%	46	15.4%
15. Inconsistent in the quality or quantity of my work performance	80	26.7%	86	28.7%	90	30.0%	44	14.6%
16. Unable to work as well as others without supervision or frequent instruction	60	20.0%	70	23.3%	90	30.0%	80	26.7%
Self-Regulation of Emotions								
17. Have trouble calming myself down once I am emotionally upset	36	12.0%	52	17.3%	96	32.0%	62	20.7%
18. Cannot seem to regain emotional control and	38	12.7%	46	15.3%	62	20.7%	70	23.3%

become more reasonable once I am emotional									
19. Cannot seem to distract myself away from whatever is upsetting me to Help calm me down. I can't refocus my mind to a more positive framework	74	24.7%	50	16.7%	62	20.7%	56	18.7%	
20. I remain emotional or upset longer than others	14	4.7%	32	10.7%	100	33.3%	76	25.3%	

Table 3 revealed that the highest percentage (26.7%) reported of executive function among nursing students was concerning self-motivation “Unable to work as well as others without supervision or frequent instruction “while the

lowest percentage reported (10.6 %) was regarding self-management to time “Not motivated to prepare in advance for things I know I am supposed to do”

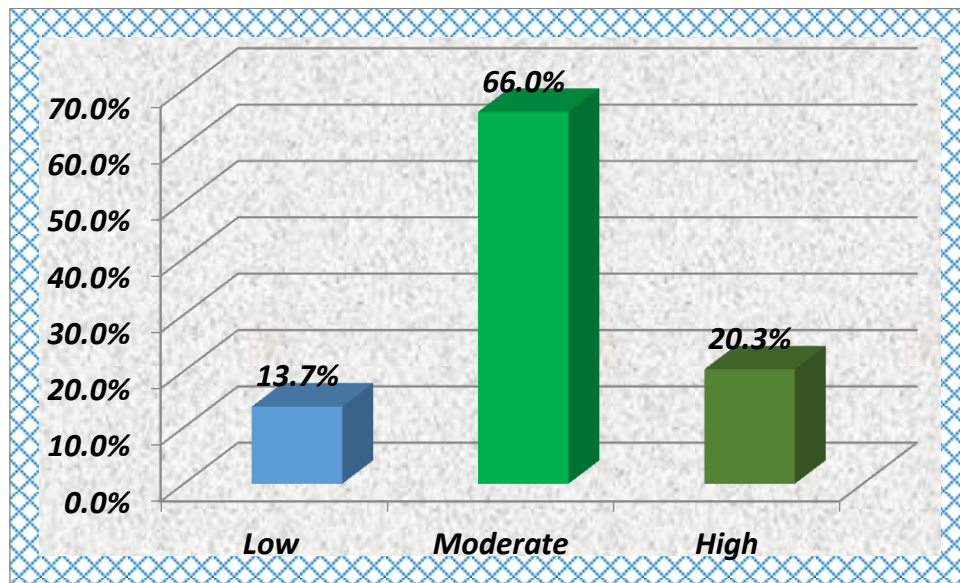


Figure (2): Total score of studied nursing students' level of executive functions

Figure 2: Illustrated that (66%) of studied nursing students had a moderate level of executive functions while (20.3 %) of them had a high level.

Table (4): Distribution of communication skills among the studied students (n=300).

communication skills	Never		Rarely		Sometimes		Often		Always	
	No	%	No	%	No	%	No	%	No	%
1. I use my tone of voice to reinforce what I am trying to say.	54	18.0%	52	17.3%	84	28.0%	40	13.3%	70	23.4%
2. I do not hear everything a person is saying, because I am thinking about what I want to say. (R)	38	12.7%	66	22.0%	98	32.7%	60	20.0%	38	12.7%
3. When talking to someone, I try to maintain eye contact.	18	6.0%	54	18.0%	102	34.0%	50	16.7%	76	25.3%
4. My body language reinforces what I am trying to say.	14	4.7%	32	10.7%	100	33.3%	76	25.3%	78	26.0%
5. I interrupt other people to say what I want to say before I forget it.(R)	74	24.7%	50	16.7%	62	20.7%	56	18.7%	58	19.3%
6. I recognize when two people are trying to say the same thing, but in different ways.	36	12.0%	52	17.3%	96	32.0%	62	20.7%	54	18.0%
7. I try to watch other people's body language to help me understand what they are trying to say.	40	13.3%	28	9.3%	92	30.7%	70	23.3%	70	23.4%
8. I recognize when people are using their hands to reinforce what they are saying.	34	11.3%	28	9.3%	100	33.3%	80	26.7%	58	19.4%
9. I recognize when a person is listening to me, but not hearing what I am saying.	40	13.3%	40	13.3%	94	31.3%	76	25.3%	50	16.8%
10. I use my own experiences to let my friends know that I understand what they are going through.	30	10.0%	36	12.0%	80	26.7%	64	21.3%	90	30.0%
11. When I am listening to someone, I try to understand what they are feeling.	36	12.0%	36	12.0%	60	20.0%	84	28.0%	84	28.0%
12. I try to see the other person's point of view.	28	9.3%	44	14.7%	96	32.0%	54	18.0%	78	26.0%

13. I change the way I talk to someone based on my relationship with them (i.e., friend, parent, teacher, etc.)	24	8.0%	50	16.7%	82	27.3%	52	17.3%	92	30.7%
14. I try to respond to what someone is saying, rather than just reacting to their tone of voice.	22	7.3%	44	14.7%	96	32.0%	64	21.3%	74	24.7%
15. To help a person understand me, I change the way I speak based on how the other person is talking to me.	16	5.3%	70	23.3%	78	26.0%	88	29.4%	48	16.0%
16. I find it easy to get my point across.	28	9.3%	64	21.3%	92	30.7%	82	27.3%	34	11.4%
17. I use my hands to illustrate what I am trying to say.	34	11.3%	46	15.3%	102	34.0%	66	22.0%	52	17.4%
18. I organize thoughts in my head before speaking.	18	6.0%	58	19.3%	92	30.7%	76	25.3%	56	18.7%
19. I use body language to help reinforce what I want to say.	18	6.0%	64	21.3%	78	26.0%	64	21.3%	76	25.4%
20. I make sure I understand what another person is saying before I respond.	18	6.0%	58	19.3%	88	29.3%	74	24.7%	62	20.7%
21. I rephrase what another person said, to make sure that I understood them.	28	9.3%	50	16.7%	70	23.3%	86	28.7%	66	22.0%
22. When someone gets mad, I change my tone of voice to help calm them down.	38	12.7%	46	15.3%	62	20.7%	70	23.3%	84	28.0%
23. I find ways to redirect the conversation when people rattle on and on.	28	9.3%	66	22.0%	44	14.7%	60	20.0%	102	34.0%

Table 4 revealed that the highest percentage (34%) reported of communication skills among nursing students was concerning find ways to redirect the conversation when

people rattle on and on while the lowest percentage reported (11.4%) was regarding find it easy to get my point across

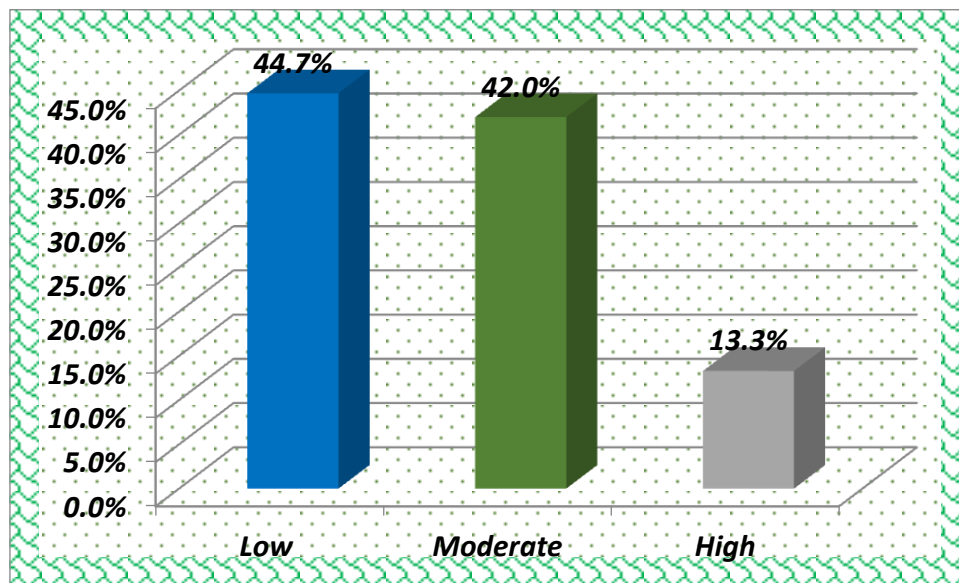


Figure (3): Total score of studied nursing students' level of communication skills

Figure 3: Illustrated that (44.7%) of studied nursing students had a low level of communication skills while (42 %) of them had a moderate level.

Table (5): Correlation between studied students' internet addiction score and their communication skills and executive functions scores.

Variables	Internet addiction	
	r	P value
Communication skills	-.785**	.000
executive Function	-.355**	.000

** . Correlation is significant at the 0.01 level (2-tailed).

Table 5: Clarified that there was a negative highly statistically significant correlation between nursing students' total scores of internet addiction, communication skills, and executive functions.

Table (6): Relation between studied students' personnel characteristics and their level of internet addiction score.

personnel characteristics	Total internet addiction score						Chi square	P value
	Low		Moderate		High			
	No	%	No	%	No	%		
Academic grade							13.28	<0.001**
Excellent	28	18.4%	16	13.0%	10	40.0%		
Very good	54	35.5%	47	38.2%	7	28.0%		
Good	31	20.4%	23	18.7%	6	24.0%		
Pass	39	25.7%	37	30.1%	2	8.0%		
Gender							33.24	<0.001**
Male	36	23.7%	62	50.4%	18	72.0%		
Female	116	76.3%	61	49.6%	7	28.0%		
Uses of internet for study							0.927	>0.05
Yes	121	79.6%	99	80.5%	18	72.0%		
No	31	20.4%	24	19.5%	7	28.0%		
Places for internet							18.3	<0.05*
Home	117	77.0%	101	82.1%	12	48.0%		
Internet clubs	31	20.4%	18	14.6%	13	52.0%		
Others	4	2.6%	4	3.3%	0	0.0%		
Most common internet sites							12.84	>0.05
Gathering information	14	9.2%	7	5.7%	7	28.0%		
Chatting	72	47.4%	61	49.6%	9	36.0%		
Sending/receiving e-mails	16	10.5%	13	10.6%	3	12.0%		
Playing games	48	31.6%	40	32.5%	6	24.0%		
Others	2	1.3%	2	1.6%	0	0.0%		

Table 6: Demonstrated that there was a positive highly statistically significant correlation between nursing students` internet addiction, academic grade, gender and place of the internet during the study.

Table (7): Relation between studied students' personnel characteristics and their level of communication score.

personnel characteristics	Total communication score						Chi square	P value
	Low		Moderate		High			
	No	%	No	%	No	%		
Academic Grade							7.71	>0.05
Excellent	18	13.4%	24	19.0%	12	30.0%		
Very good	52	38.8%	43	34.1%	13	32.5%		
Good	27	20.1%	24	19.0%	9	22.5%		
Pass	37	27.6%	35	27.8%	6	15.0%		
Gender							43.63	<0.001**
Male	76	56.7%	39	31.0%	1	2.5%		
Female	58	43.3%	87	69.0%	39	97.5%		
Uses of internet for study							0.589	>0.05
Yes	108	80.6%	100	79.4%	30	75.0%		
No	26	19.4%	26	20.6%	10	25.0%		
Places for internet							2.89	>0.05
Home	106	79.1%	95	75.4%	29	72.5%		
Internet clubs	24	17.9%	27	21.4%	11	27.5%		
Others	4	3.0%	4	3.2%	0	0.0%		
Most common internet sites							7.06	>0.05
Gathering information	7	5.2%	14	11.1%	7	17.5%		
Chatting	68	50.7%	57	45.2%	17	42.5%		
Sending/receiving e-mails	15	11.2%	13	10.3%	4	10.0%		
Playing games	42	31.3%	40	31.7%	12	30.0%		
Others	2	1.5%	2	1.6%	0	0.0%		

Table 7: Presented that there was an only positive highly statistically significant correlation between nursing students` communication skills and their gender during the study.

Table (8): Relation between studied students' personnel characteristics and their level of executive functions score.

personnel characteristics	Total executive functions score						Chi square	P value
	Low		Moderate		High			
	No	%	No	%	No	%		
Academic Grade							33.12	<0.001**
Excellent	19	46.3%	23	11.6%	12	19.7%		
Very good	8	19.5%	84	42.4%	16	26.2%		
Good	8	19.5%	37	18.7%	15	24.6%		
Pass	6	14.6%	54	27.3%	18	29.5%		
Gender							3.22	>0.05
Male	20	48.8%	77	38.9%	19	31.1%		
Female	21	51.2%	121	61.1%	42	68.9%		
Uses of internet for study							3.80	>0.05
Yes	28	68.3%	162	81.8%	48	78.7%		
No	13	31.7%	36	18.2%	13	21.3%		
Places for internet							16.68	<0.001**
Home	23	56.1%	160	80.8%	47	77.0%		
Internet clubs	18	43.9%	32	16.2%	12	19.7%		
Others	0	0.0%	6	3.0%	2	3.3%		
Most common internet sites							35.90	<0.001**
Gathering information	14	34.1%	11	5.6%	3	4.9%		
Chatting	12	29.3%	101	51.0%	29	47.5%		
Sending/receiving e-mails	4	9.8%	21	10.6%	7	11.5%		
Playing games	11	26.8%	62	31.3%	21	34.4%		
Others	0	0.0%	3	1.5%	1	1.6%		

Table 8: Demonstrated that there was a positive highly statistically significant correlation between nursing students' executive functions, academic grade, place of internet and Most common internet sites during the study

DISCUSSION

It is generally agreed that the internet plays an important role in our life. Internet activities and technologies that are increasing rapidly have attracted young adults, leading to excessive use of the Internet and maladaptive Internet attitude known as "Internet addiction" (Abdel-Salam et al., 2019).

The nursing students' internet addiction can adversely affect their executive functions and communication skills. Therefore, this study aimed to examine the effect of internet addiction on executive function and communication skills among university nursing students.

Regarding Personal Characteristics of Studied Nursing Students, this study shows, where the total number of nursing students was 300 From the Faculty of Nursing Zagazig University. Concerning their academic grade, one-third of them had a very good grade. Regarding their gender, more than three-fifths of them were females. Regarding students' usage of the internet for studying, the majority of both of them use the internet for studying. Regarding the places for the internet, more than three-quarters of both of them use the internet at home. Concerning most common internet sites more than two-fifths of them uses the internet for chatting. This might be due to female' students easily caught to complete the survey as they spending more time in their classes and also refer to the availability of computers and internet means at home and online chatting was found to be a definite risk factor for internet addiction. (Korkeila, Kaarlas and Jääskeläinen 2010).

This study goes online with Halima et al., (2015) who conducted a study entitled "The prevalence of Facebook use among zagazig university students and its relation to internet addiction, anxiety, and depression, a cross-section study, 2014" and revealed that two-fifths of zagazig university students studying at the third year and nearly three-quarters of them were females.

This study supported by Smita and Azhar (2018) who conducted a study entitled "Prevalence and Characteristics of Internet Addiction among University Students in Mauritius" and reported that the majority of university students' main online activities comprised preferentially of information searching chatting/ communicating and more than four-fifths of them downloading media content. This is similar to Goel, Subramanyam, and Kamath (2013), who conducted a study entitled "A study on the prevalence of internet addiction and its association with psychopathology in Indian adolescents" and mentioned that the main online activities in a study of young Indian people. also involved social networking, chatting, and downloading media files.

Similarly, a study conducted by Xin, Xing, Pengfei, Houru, Mengcheng and Hong (2018) who carried out among adolescents in China and showed that the five most popular online activities were social networking, schoolwork, entertainment, internet gaming, and online shopping and a study carried out in Jordan by Malak, Khalifeh, and Shuhaiber (2017) who showed that chatting was the main online activity and the main focus of online activities involves online relationships and social networking.

This study disagreed with Effat, Azab & Mahmoud (2019), who conducted a study entitled "The Relationship between Anxiety, Depression, and Problematic Internet Use among a Sample of university students in Egypt" in Sohag University and revealed that internet addiction was more in males than in females. significantly used the internet in

chatting and games more than students with non-problematic internet users who utilized the internet more to gather information and for news.

This finding was inconsistent with **Gentile, Choo, and Liau (2011)** who conducted a study entitled "Pathological video game use among youths: A Two-year longitudinal study" and reported that excessive computer/video game playing was predictive of internet addiction. Besides, **Seifi, Ayati, and Fadaei (2014)** who conducted a study among students of Islamic Azad University of Bijan collected the data through self-administrated online survey samples and found that four-fifths of the studied sample were males.

even though **Nath, Naskar, and Victor (2016)** who conducted a study entitled "A cross-sectional study on the prevalence, risk factors, and ill effects of internet addiction among medical students in Northeastern India" and found that more than four-fifths of the surveyed medical students were using the internet mainly for non-academic purposes (social networking and downloading media).

As regard to the distribution of internet addiction among nursing students, the current study illustrated that the highest percentage reported of internet addiction among nursing students was concerning forming new relationships with fellow online users and regarding the others in their life complain about the amount of time you spend online while the lowest percentage reported was regarding checking their email before something else that you need to do.

Haque et al., (2016) supported the findings of the present study that the majority of the students spent online than they intended and About one-fifth of the students reported that they received frequent complaints about spending much time online and just over half of the students either frequently or occasionally declared that they checked email first before doing any other work

This study was supported by **Christakis DA, Moreno MM, Jelenchick L, Myaing MT, Zhou C. (2011)**. Who conducted a study entitled "Problematic internet usage in US college students: a pilot study" and found that US college students also form new relationships with fellow online users, as found in the present study. also, about one-fifth of the students reported that they received frequent complaints about spending much time online. Besides, more than one-third of students either frequently or occasionally declared that they checked email first before doing any other work

Also, this finding was consistent with **Campanella, Mucci, Baroni, Nardi, and Marazziti (2015)** who conducted an Italian study and found that more than one-fifth of students checked email first before doing any other work

This study was inconsistent with **Khazaal, Achab, Billieux, Thorens, Zullino, Dufour & Rothen (2015)** who reported that the most distribution of internet addiction among students was occasionally students neglected their household responsibilities.

Concerning nursing students' level of internet addiction, the result of the present study revealed that more than two-fifths of students had a moderate level of internet addiction while slightly more than half of them had a low level of internet addiction. This might be attributed to University students are greatly vulnerable to internet addiction due to many reasons as the following: University campuses provide easy and unlimited access to internet; The young students experience autonomy and relief out of the parent control for the first time in their lives; Finding new friends is often done through internet; Students confront difficulties in the university settings; The need for usage of the modern technologies is greatly stronger in the youth than any other age groups; The virtual atmosphere of internet lures students out of the burden of achievement university tasks and homework and taking tests. (**Salehi, Khalili, Hojjat, Salehi and Danesh 2014**).

This study supported by **Abdel-Salam et al., (2019)** who assess the prevalence of Internet addiction and its associated factors among female students at Jouf University, Saudi Arabia and demonstrated that nearly half of the students had a moderate level of addictions.

This study goes in line with **Khalil, Alharbi, Alhawasawi, and Albander (2016)**, Who conducted a study among nursing students at King Saud Bin Abdul-Aziz University for Health Sciences, Jeddah. and revealed that more than one-third of nursing students were categorized as moderate Internet addiction.

This result is congruent with **Alhajjar (2014)** who conducted a study entitled "Internet addiction and psychological morbidity among nursing students in Gaza-Palestine" and found that one-third of participants were at risk for Internet addiction. Also, **Lam, Peng, and Jing (2014)** conducted a study entitled "The association between Internet addiction and self-injurious behavior among adolescents" and reported that less than one-fifth of the studied adolescents were moderately addicted, and a small percentage of them were severely addicted to the Internet.

This result was in disagreement with **Shaheen, Farahat and Gaber (2016)**, who conducted a study entitled "Problematic internet use among medical school students in Menoufia University Egypt" and mentioned that more than two-fifths of medical school students had severe and pathological internet users, In the same line, **Desouky and Ibrahem (2015)** who found in their study; "Internet addiction and psychological morbidity among Menoufia University students, Egypt" that less than one-fifth of both medical and nonmedical students were problematic internet users and nearly two-fifths were potentially problematic internet users.

These results are also close to the findings of **Al-Gamal, Alzayyat, and Ahmad (2015)**. who conducted a study entitled "Prevalence of internet addiction and its association with psychological distress and coping strategies among university students in Jordan" and revealed that two-fifths of university students had severe internet addiction.

The results of this study are similar to the findings of **Taha, Shehzad, Alamro and Wadi (2019)** who conducted a study entitled "Internet Use and Addiction Among Medical Students in Qassim University, Saudi Arabia" and reported that internet addiction is prevalent among medical students at Qassim University, also, revealed that less than one-fifth of medical students are addicted to the Internet and more than half of them were at risk of becoming addicted

This study is incongruent with **Khayat, et al., (2018)**, who conducted a study among university students in Jeddah, Saudi Arabia and found that slightly more than two-fifths of the studied sample had mild internet addiction and nearly one-third of them had a moderate level of internet addiction.

As regard, nursing students' level of executive functions, the result of the present study revealed that more than two-thirds of studied nursing students had a moderate level of executive functions while one-fifth of them had high executive functions. This might be due to their academic grade, more than one-third of them have very good grade and more than two-fifths of them had moderate level of communication. In addition, highest percentage reported of executive function among nursing students was concerning self-motivation.

This result was in disagreement with **Olsson, Arvidsson & Johansson (2019)**, who revealed in their study about: Relations between executive function, language, and functional communication that, nearly about four-fifths of the participants had a low level of executive functions.

Regarding nursing students' level of communication skills, the result of present study revealed that more than two-fifths of studied nursing students had low level of communication skills while more than two-fifths of them had moderate level. This might be due to Nursing education is divided into two parts, namely theory and practice. Being a significant element in practical education, clinical education is an indispensable part of nursing education. Clinical education enables students to put their theoretical knowledge in practice, to gain competence in psychomotor and intellectual skills, to get involved in critical thinking, to make observations, to define and solve problems, to make decisions, to participate in teamwork, to develop communicative, administrative and teaching skills, to get prepared for future roles, and to develop self-confidence and communication skills. (**Öztürka, Çilingirb and Şenelc 2013**).

On the other hand, this result was in disagreement with **Iksana, Zakariaa, Meeraha, Osmana, Liana, Mahmuda & Krishb, (2012)**, who conducted a study entitled "Communication skills among university students" and asserted that the majority of university students have achieved high level of communication skills while only one-fifth of them had low level of communication skills.

This study was in contrast with **Shafakhah, Zarshenaz, Sharif, & Sarvestani, (2015)**, who conducted a study entitled "Evaluation of Nursing Students' Communication Abilities in Clinical Courses in Hospitals" and mentioned

that nursing students in higher semesters had better communication skills. Also, World Health Organization (WHO) survey indicated that the communication level of the nurses who graduated from colleges or universities was significantly higher compared to those who received lower educational levels (**WHO, 2009**).

Concerning the correlation between studied students' internet addiction score and their communication skills and executive functions scores, the current study demonstrated that there was a negative highly statistically significant correlation between nursing students' total scores of internet addiction, communication skills, and executive functions.

On the other hand, this study was in contrast with the findings of **Olsson, et al., (2019)**, who revealed that no relations were found between executive functions and communication skills.

This study agreed with **Kuo, Chen, Chang, Lee, Liu, & Chen (2018)**. Who conducted in Taiwanese and found statistically correlation between executive function and internet addiction and reported that executive function was lower in the internet addiction group than in the internet non-addiction group.

Regarding Correlation between Personal Characteristics and nursing students' internet addiction, communication skills, and executive functions, this study displayed that there was a positive highly statistically significant correlation between nursing students' internet addiction, academic grade, gender and place of the internet during the study. Also, there was an only positive highly statistically significant correlation between nursing students' communication skills and their gender during the study, besides, there was a positive highly statistically significant correlation between nursing students' executive functions, academic grade, place of internet and Most common internet sites during the study

This reported result went on the same track with the results of **Olsson, et al. (2019)** There were no significant correlations between executive functions and gender.

This study agreed with **Elkin, Karadağlı, and Barut (2016)**, who found that female students had higher communication skills than male students.

This study in contrast with **Kahyaoğlu Süt, Demir and Özer (2015)** who concluded that gender did not affect communication skills.

This study is incongruent with **Saied, Elsabagh, and El-Afandy (2016)** who found significant negative correlation was present between internet addiction scores and academic grade of the students

This study disagreed with **Al Saif, (2009)**, who reported that the prevalence of internet addiction did not vary with sex, Inconsistency with **Desouky and Ibrahim (2015)**, who found that males had higher percentages of internet addiction than females

CONCLUSION

The study concluded that that the nursing students had moderate level of internet addiction, the studied nursing students had low to moderate level of communication skills and had moderate level of executive functions in addition to there was a negative highly statistical significant correlation between nursing students` total scores of internet addiction, communication skills, and executive functions.

RECOMMENDATION

- [1]. Implementing more effective intervention programs for the vulnerable group of Internet addiction
- [2]. Development of awareness about internet addiction disorder among the students and provision of the intervention of cognitive behavior therapy of those found with an Internet addiction disorder.
- [3]. College students need to make a better-balanced relationship between the internet and social media use versus their academic study and social life
- [4]. Comprehensive programs should be formulated to raise public awareness about the hazards and determinants of internet addiction, emphasizing on targeting men, adolescents, and young adults on one side
- [5]. Increase the awareness of university administrators as well as parents of this growing problem and encourage them to implement prevention programs to deal with it.
- [6]. Seminars, conferences and activities could be organized to highlight the negative consequences of internet addiction.
- [7]. The phenomenological study can be done to assess the quality of life among college students affected by internet addiction.

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