Relation between Mindfulness Awareness and Internet Gaming Addictive Behavior among Suez Canal University Students

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Abstract

Background: Mindfulness is a practices used to help the individual to find the right behavior and become aware of own behavior, habits and own reactions; it is very useful for teenagers to give up away from addictive behaviors **Aim of the study:** Assess the relation between mindfulness awareness and internet gaming addictive behavior among university students. **Research design:** A descriptive research design was used in the study. **Setting:** The study was conducted at Suez Canal university- Ismailia city in a randomly selected six faculties divided in to two medical, two practical and two theoretical faculties. **Sample:** A systematic random sample of 102 university students were selected in this study. **Tools for data collection:** Data was collected using five tools namely; knowledge about internet gaming, video game usage questionnaire, game addiction scale, problematic video game play revised scale and mindfulness attention awareness in addition to demographic characteristics sheet. **Results:** There was a highly statistically significant relation between low levels of highly engaged, problem gamers, and addicted gamers and high level of mindfulness. It is evident that game addiction increased with low level of mindfulness. **Conclusions:** There is a relation between mindfulness awareness and internet gaming addictive behavior and special attention should be given to the pattern of internet gaming addictive behavior among university students. **Recommendations:** Raising adolescents' awareness about adverse effects of internet gaming addiction on their health status; through mass media and health education programs at schools, universities and family-centered care.

*Keywords***:** Addictive behavior, Internet gaming, Mindfulness, University students.

1. Introduction

The internet become a daily basic part of human life. For the majority of individuals, it represents an incredible information tool and opportunity for social connectedness and self-education. Nowadays with developing information and communication technologies (ICT) has changed the traditional ways of

relating and identifying self **(Khalil et al., 2020)**.

The internet is not only acts as an entertainment tool, but also an important professional resource for work, communication as well as education. It has enlightened the community world by providing numerous applications and well known benefits. These benefits have been widely investigated and comprise keeping in touch with colleagues, family partners through electronic email post, finding information about food, goods, and merchandize services, transferring money, searching for jobs, and getting the recent and updating news of medical health information **(Dumrique&Castillo,2018)**.Moreover, among internet advantages; downloading of recreational soft music, visiting discussion forums, engaging with entertainment games and assisting with educational and academic needs **(Ali et al., 2019)**.

However, for some teenagers who play online games, the internet acts as an enabler. It is used to feed an addiction, which by its definition interferes with daily life, work and personal relationships. Online games may have significantly negative consequences, especially in the lives of students, through causing distraction and interfering with important reaction of out-game life actions, such as academic performance, health and social life **(Ismail et al**., **2021**).

Game addiction is a form of behavioral addiction that shows impulsiveness, indifference to interpersonal relationships, association with other addictions, and psychological and physical symptoms when the game is stopped. As most modern games are based on the internet due to the development and dissemination of the internet, the term "internet gaming disorder" has been adopted to denote game addiction in a condition where DSM-5 requires further research; over the past 12 months, failure of excessive control over internet games, obsession, experience of abstinence when games are stopped, decreased interest in other hobbies or entertainment, continuous use of tolerance, awareness of psychological and social problems, false reporting of internet game playing time to others, and the use of internet games to escape negative mood are factors used to diagnose internet gaming disorders **(Choi et al., 2021)**.

According to **(Backe, 2020)**, electronic game is an activity in which players

engage in an artificially disputed conflict that is governed by certain rules in a way that leads to quantifiable results, and it is called an electronic game if it is available in digital form, and it is usually played on computers, televisions, mobile phones and mobile devices such as laptops, iPad, Play- Station, Digital Versatile Disk (DVD) and virtual reality.

Interent addiction (IA) is highly prevelant among university students **(Elnahas etal., 2018)**. Regarding to **Khalil et al., (2016**) the university students are among high risk groups for internet addiction because they use the internet for both educational purposes, such as doing assignments and searching information sources and non-educational purposes like communication with friends and entertainment.

University students experienced a lot of stressors throughout their life. Among those stressors that may involve different types of life events such as interpersonal problems, school related problems, family related problems and personal problems that are characterized by either a higher or lower frequency of occurrence **(Hosseini et al., 2015)**.

So, university students face a significant danger of acquiring addicted to the internet since they frequently have free and unrestricted internet access and are expected to utilize this technology for learning reasons. In fact, numerous studies have shown that addiction to the internet is more common among teenagers and young adults than in the general population. Internet-addicted university students likely to suffer a wide range of academic challenges, physical and mental health issues, behavioral problems and daily routines disruption. As well as related to cognitive/neurological deficiency and low academic performance **(Tang, 2018)**.

In Egypt, mobile gaming is fast becoming the standard way to game. Indeed, considering the country's high rates of smartphone penetration and the relative costs associated with traditional gaming consoles, Egypt, like much of the rest of the world, is fast becoming mobile-first when it comes to gaming **(Egypt Mobile Gaming Statistics, 2022)**.

Indeed, electronic gaming addiction exposes the teenagers to health risks including poor eyesight such as a significant decrease of vision on the long run as a result of sitting for long periods in front of the electronic screen, and also leads to headache, wrist pain, neck

pain, blisters, calluses, sore tendons, and numbness of fingers, sleep abnormalities, and repetitive strain injuries, obesity and psychological process disturbances especially concentration and thinking disorders, poor diet quality, insomnia symptoms and excessive daytime sleepiness; and it can even cause sudden death **(Mundy et al., 2020 &Chen et al., 2020)**.

Today's modern technology has exposed mobile phone users(Gamers) who often use smartphones to access online games, so that it makes them stay up for a long time exposing to almost constant radiation even if they do not use the phone all the time. Testis is one of the organs in the human body that is sensitive to radiation, even at low doses, in which the radiation may disturb spermatogenesis, these disturbance of spermatogenesis may cause infertility in men and the electromagnetic radiation from mobile phones can directly cause DNA damage in the male genital tract cells **(Syam et al., 2017)**.

According to **(Dahabiyeh et al., 2020; Muhamad & Kim, 2020)**, most of the games used by adolescents contain negative connotations, which may affect them in all stages of their development, and also generate some unwanted behaviors, especially since these electronic games tend mostly to the side of violence and conflict between two teams or between two players, and embodied in the mentality that life is all a fight, and forgetting the principles of dialogue, understanding, cooperation and integration.

Furthermore, excessive and uncontrollable online game use increases the risk of mood disorders and obsessive thoughts, players report neglecting meals, school, and work; sleeping less; and experiencing tension with family members **(Sioni et al., 2017)**. Thus, the addictive gaming has been associated to computer based behavioral addictions such as internet addiction and Facebook addiction (**Gonzalez-Bueso et al., 2018)**.

There is a grateful link between mindfulness and gaming addiction because gaming often serves as a passive coping strategy to manage real-life problems by providing a temporary escape into a virtual reality **(Li et al., 2018)**. The experiential avoidance can perpetuate technology addiction resulting in IGD that is often associated with many negative consequences **(Marchica et al., 2020)**.

Internet addictive teenagers must be supervised on a multi professional level. The nurse, thus represents the professional who

works as a sort of conjunction among team which care of person affected by internet addiction disorder. The nurse must deeply identify the definite aspects related to internet addiction and its consequences and understand the special meaning of specific attitudes told by the individual. The goal of nurse profession is to give back to the individual their own self- control, to lead the correct management of the time to the internet, understanding its real role made to inform, interact and abolish distances **(Tomaszek & Muchacka, 2019)**.

Mindfulness is considered a best form of behavioral, cognitive, and affective self-regulation. Adolescents are asked to maintain a decentered awareness of mental content without "reacting" to the mental event such as elaborating or becoming preoccupied with the thought). Instead, mental content is allowed to arise within conscious awareness and to subside as a natural mental process **(Newell, 2021)**.

2. The aim of the study:

This study aimed to assess the relation between mindfulness awareness and internet gaming addictive behavior among university students.

Objective of the study:

1- Assess internet gaming addictive behavior and its risks among university students.

2- Assess mindfulness awareness among university students.

3- Explore the relationship between internet gaming addiction levels and mindfulness awareness among university students.

3. Subject and Methods

3.1. Study design:

A descriptive research design was used in the study.

3.2. Study setting:

The study was conducted at Suez Canal University in Ismailia city on six faculties divided in to two medical, two practical and two theoretical faculties.

- Medical faculties: faculty of nursing and faculty of Pharmacy.
- Clinical faculties: faculty of science and faculty of computing and information.
- Theoretical faculties: faculty of literature and faculty of tourism and hotels.

3.3. Study subjects:

A sample of 102 university students having internet gaming addictive behavior were included in the study and chosen randomly from first and second academic years in each faculty during the period of data collection.

3.4. Tool of data collection:

Interviewing questionnaire was used in the current study to collect the needed data. It is divided into five tools.

Tool 1: Interview questionnaire form

This tool was constructed by the researcher based on review of pertinent literature. It included two parts:

PartI: Demographic characteristics:

Included students' age, gender, residence, faculty name, recreational activities, academic level and family income.

Part II: Knowledge about electronic games:

Consisted of six questions covering the name of internet game used and its classification, favorite place used during gaming and reasons for using internet game. Each correct answer was scored "1" and the incorrect scored "2". The scores of all questions were summed-up and converted into a percent score.

Tool 2: The Video game usage questionnaire

It was developed in an English language by **Tolchinsky, (2013)** and translated into Arabic by the researcher using translating back translation technique to ensure its validity **(Behling &Law 2000).** It consisted of a 11 items to assess information regarding the average number of hours played per week, average duration of each playing session, what time of day the player typically plays, and an estimate of how much of each player's life is spent engaged in these games, preference for online interaction and playing games over real life interactions, and whether or not the participant identified as a "gamer" i.e., someone who is an avid video game player.

Scoring system:

Questions 8,9,10 and 11 rated on a three-point Likert-type scale (1 = Never, 3 = Sometimes, 5 = Often) and then summing up item scores.

According to total score of the video game usage which ranging from 4 to 12, users who scored 4≤ 6 points were defined as low video game usage user, and 7 points or higher were

defined as high video game usage user.

Tool 3: The game addiction scale (GAS)

It was developed by **Lemmens, (2009)** and translated into Arabic by **Asaad et al., (2019).** It consisted of 21 items to assess pattern of gaming among adolescents whether it is normal, risky or disordered gaming. It is designed to measure seven domains; salience, tolerance, mood modification, withdrawal, relapse, conflict and problems.

Each domain is represented by three questions with the phrase "How often during the last 6 months" preceding every question to explore the impact of gaming on different aspects of the subject's life.

Scoring system:

Respondents indicate their responses on a 5-point Likert-type scale (1 = never, 2 = almost never, 3 = sometimes, 4 = often, 5 = very often). Respondents who endorse all 4 domains tapping core addiction criteria (relapse, withdrawal, conflict, problems) are categorized as addicted gamers, while those who endorse 2 or 3 of the core criteria are categorized as problem gamers. Respondents who endorse all the 3 domains tapping gaming engagement (salience, tolerance, mood modification), whereas fulfilling none

or one of the core addiction criteria are categorized as highly engaged gamers. Non addicted/non problem/non highly engaged gamers endorse less than the mentioned above scores.

Tool4: Problematic Video Game Play-Revised (PVGP-R) Scale

It was developed by **(Tolchinsky & Jefferson 2011)** and translated into Arabic by the researcher using the translation back translation technique to ensure its validity **(Behling and Law, 2000).** It consisted of 35 questions which was administered using a 3-point Likert-type scale (1 = Never, 2 = Sometimes, 3 = Often). These questions address three factors; psychological, physical, and social consequences of problematic game play.

Factor 1: psychological dysfunction includes questions 1, 2, 3, 6, 11, 20 and 31.

Factor 2: mood regulation includes questions 5, 9, 10, 12 and 15.

Factor 3: physical dysfunction included questions 7,14,17,22, 24, 27, 30, 32 and 34.

Factor 4: concealing behavior includes questions 13, 19, 21, 28 and 29).

Factor 5: failure to limit play includes

questions 8, 16 and 26.

Factor 6: time management difficulties include questions 4, 18, 23, 25, 33 and 35.

Scoring system:

According to total score of the (PVGP-R) which ranging from 35 to 105, users who scored 35≤53 points were defined as non-problematic user, and 54 points or higher were defined as problematic user

Tool 5: Mindfulness Attention Awareness Scale (MAAS)

It was developed by **Brown and Ryan, (2003)** and translated into Arabic by **(Rayan & Ahmad, 2018).** It consisted of 15 items to assess a core characteristic of mindfulness namely; a receptive state of mind in which attention, informed by a sensitive awareness of what is occurring in the present and simply observes what is taking place in which respondents indicate on a 6 point Likert-type scale (from 1= almost always to 6 = almost never) to evaluate the degree of awareness and attention regarding what is occurring in the present moment. Score 1 for each item indicates absence of attention or awareness, while score 6 indicates the greater level of attention or awareness.

Scoring system:

According to total score of the MAAS which ranging from 15 to 90, users who scored 15≤ 49 points were defined as low-mindful user, and 50 points or higher were defined as high mindful user **(Arpaci, 2021).** High scores obtained from the scale indicate high mindfulness levels.

Tool validity and reliability:

The five tools were revised for face and content validity. It was ascertained by a panel of five experts. Three professors in the field of psychiatric and mental health nursing, two professors in the field of psychiatric medicine. The tools were rigorously revised for clarity, relevance, comprehensiveness, understanding and simplicity for implementation. No modifications were done.

3.5. Field work:

- Data was collected from the selected settings by researcher using five tools for data collections, where the student can answer questions after explaining the purpose of the study.

- Data collection took about six months from (October 2020 / until April 2021), according to time available to students and their

attendance schedule at faculties.

- The approximate time spent with each student during one to one interview is (40-45) minutes because of novelty of topic and time needed for warming up the relationship with student.

- It was difficult to gather all students at the same time; so they were divided into small groups and each group consisted of (7 -10) students because of COVID19 pandemic period to maintain distance and protective measurements.

3.6. Pilot study:

A pilot study was carried out on 10 student of the study participants to check the applicability and feasibility of the instrument, to identify the obstacles and problems, and to take needed measures to manage these obstacles and problems when collecting data. Also to estimate the time needed to fill in the tools. This sample was excluded from the total sample.

3.7. Ethical considerations:

Official permission was obtained from the ethical scientific research committee session number (14) code number (39/7-2018) at the faculty of nursing, Suez Canal University to upload the informed consent and get the students' agreements to participate in the study. The students were informed that any individual included in the study has the right to refuse to participate in the study or withdraw from the study at any time with no negative consequences to them, and the confidentiality of the data and results was maintained.

3.8. Data analysis:

Data were organized, revised, tabulated using the SPSS program, version 22. All continuous data were normally distributed and were expressed in mean ±standard deviation (SD). Categorical data were expressed in number and percentage. Statistical significance was set at $p < 0.05$ and P- Value < 0.001 highly significant.

2. Results

Table (1): shows that, the students in mean age is 19.5±0.69 years. More than half of the students were from urban areas and have intermediate income 66.5%.

Table (2): shows that the majority of studied students reported that preferred game was PUBG (89.2%), used mobile phone during playing game (76.5%), preferred playing games at home, preferred talking about

internet games during studying day and preferred internet games rather than reading or studying 92.2%, 85.3% and 69.1% respectively.

Table (3) :reveals that about one third of the studied students (33.30%) had highly engaged level of game addiction, (25.50%) had non problematic level of game addiction.

Table (4): shows that the majority of studied students (92.2%) had low level of mindfulness awareness compared to (7.8%) had high level of mindfulness.

Table (5): shows that, the level of mindfulness attention awareness was high among non-problematic (2.9%), highly engaged (2.0%), problem gamers (2.0%) and addicted gamers (1.0%) There was a highly statistically significant relation between low levels of highly engaged, problem gamers, and addicted gamers and high level of mindfulness. It is evident that game addiction increased with low level of mindfulness, whereas p ≤ 0.001

Discussion:

Excessive online and offline gaming is a detrimental practice that is associated with gaming addiction **(Ayumi et al., 2019)**. The majority of online game players are teenagers,

who ecstatic to express themselves in the virtual world, they experience anxiety in the real world, which causes gaming addiction. Teenagers often engage in excessive internet gaming, playing nonstop until they forget to do other activities. This has a negative impact physically, psychologically, academically, socially and spiritually **(Humayya et al., 2022)**.

The present study was conducted on a sample of Suez Canal University students representing six faculties categorized as medical, clinical and theoretical ones. Their demographic characteristics were those of typical adolescent university students, with a higher proportion from urban areas, consistent with where they studied; Suez Canal University. Also, the majority of the studied students were males. This result might be due to the fact that female students are attracted to activities that more oriented towards social and communication-related activities and that females in the Egyptian community received more family supervision than males, potentially preventing them from developing highly engaged level of internet gaming addiction. In addition, may be due to presence of more digital game types appealing to male students and females are interested with watching television.

Regarding residence, the present study revealed that the majority of the students in the intervention and control groups have intermediate income. This result explained by the fact that a university student needs a reasonably high income level to purchase the modern mobile devices and consoles required for gaming. Also purchasing fast internet and gaming software. Living in urban areas also affects on social connectedness where individual can't connect or chairing activities with others such as friends or neighbors.

The previous result is consistent with **(Rawshon et al., 2017; Singh, 2018 &Mahmoud et al., 2022)** who reported that internet gaming addiction is more common among males than among females. In the same context **(Naaj & Nachouki, 2021)** revealed that internet gaming addiction is more common among male's university students in the United Arab Emirates (UAE) than female counterparts. On the other hand, **(Spilkova et al., (2017)** found that, females are more prone to online communication and social media use while males are more prone to online gaming.

The previous result is inconsistent with **(Lam et al., 2009)** who reported that no gender differences in terms of internet addiction. The difference between both results might be due to the fact that, the studies were applied using different tools and among different sample size.

In addition to, **Abdel-raouf et al., (2022)** observed a higher prevalence of video game disorder in students living in urban areas and with medium and high socioeconomic statuses. A correlation test revealed that video gaming disorder (VGD) was positively correlated with medium and high socioeconomic statuses. Similarly, **Shi et al., (2019)** found that students living in urban regions experienced significantly more problematic video gaming than those from non-urban regions. Also **El-Nahas et al., (2018**) reported that problematic gaming disorder was negatively associated with high socioeconomic status.

Regarding gaming preference, the current study found that the majority of studied university students mention that, their favorite game is PUBG (Player Unknown's Battlegrounds). This result might be due to the online games generally filled and supported with features of special items such as flow understanding, unique simulation, versatility, competition, and a plot an interesting story. This result is similar to the findings of **Meschtscherjakov et al., (2016)** who stated that, the favorite game among

majority of studied students is PUBG. This result is incongruent with **Khalil et al., (2020)** who mention that 51.9% of the students didn't mention their favorite games, and game addict students showed significantly higher sports and action games practice.

Regarding devices used during playing internet video games, the current study revealed that, almost three quarters of students used a mobile phone. This result might be due to the adolescents consider smartphones as a main tool for meeting friends, online game playing, social network and to fulfill several responsibilities, as well as the availability of games which attract users through attractive images, colors, music, and advanced technologies that makes it easy to access games in the minimal time and effort. Congruent with a study conducted in Egypt by **Saied et al., (2016)** who study internet and Facebook addiction among Egyptian and Malaysian medical students, stated that the majority of the students of both groups reported that the most commonly used device in both groups was mobile phone. The prior result was corresponding with result of studies conducted by **Lenhart et al., (2015)**; **Urhan & Karcı (2021); Zala & Misra (2022)** who stated that, the majority of the students used mobile phones followed by

computers to play games. Additionally, **WanYaacob et al., (2021)** mentioned that students chose a mobile phone as a preferable gaming device because it is multi-purpose and quick to manage rather than other platforms, such as computer, console, and arcade which are likely to be more complex to use.

Also, the current study revealed that the majority of students preferred playing games at home. This result can be explained by the fact that the mobile is used for different roles, gamers often use the mobile phone to access online games at home through Wi-Fi and they may have sufficient time after studying day to prevent distraction during class time which help to expose them to the non-stop experience of playing the games. This result was similar to a study conducted in Egypt by **Mahmoud et al., (2022)** who stated that students with internet addiction significantly had internet access in their homes than students of normal internet use. Also **Saied et al.,(2016)** mentioned that the majority of the students reported that "home" is the most frequent place for internet access.

Regarding gaming addiction and level of mindfulness the result of the current study showed that the majority of studied students had low level of mindfulness awareness. In a similar vein, **Moqbel, (2020)** stated that

decreased mindfulness level was among smartphone users and internet addiction gamer. Also, **Yao et al., (2017)** shown that mindfulness is negatively correlated with internet addiction behavior and is considered to be a protective factor.

Additionally, **Sun (2022)** noted that teenagers with lower levels of mindfulness have a higher propensity to engage in harmful, addictive social media practices. In this regard, **Lie et al., (2018)** discovered that the mindfulness intervention program had considerably reduced the internet addiction behaviors in seven out of eight participants.

3. Conclusion:

Based on the findings of the present study, it can be concluded that There is a relation between mindfulness awareness and internet gaming addictive behavior and Special attention should be given to the pattern of internet gaming addictive behavior among university students.

Recommendations:

A) Education:

1- Developing a clear and impressive orientation programs about adverse effects of internet gaming addiction on adolescents' health status through mass media and health education in the schools, universities and family-centered care.

2- Conducting educational and awareness seminars sessions about mindfulness training for educators in university classroom to help students who are addicted to electronic games and need management.

B) Institutional management and practice:

1. Conducting a trusted health websites and numerous communicating channels to increase awareness through school campaigns, about negative consequences of gaming addiction.

2. Universities should augment first-year curriculum at different educational levels with mindfulness training practices.

3. Urging parents to occupy their adolescent's free time with useful activities and set a clear time limit for online gaming.

4.Dissemination of mindfulness training programs to other students in different faculties at Suez Canal University on large sample size for further confirmation of the findings and improvement in internet gaming addictive behavior.

Nursing research:

1. Further researches are suggested to assess the effect of mindfulness training programs targeting secondary schools and university students on academic performance.

2. Conducting scientific studies that emphasis on a greater numbers of the sample among university students in different academic levels to confirm and generalize the result of the current research.

Table 1: Demographic characteristics of studied university students in the intervention and control groups (n=203).

Demographic characteristics	Studied university students	
Variables	**No.**	**%.**
≥18	12	11.8%
19	19	18.6%
20	71	69.6%
Mean ±SD	19.6±0.70	
Range	18-20	
Male	53	52.0
Female	49	48.0
Rural	34	33.3
Urban	68	66.7
Low	8	7.8
Intermediate	91	89.2
High	3	2.9

(*) significant p-value <0.05.insignificant > 0.05.

Table 2: Distribution of studied university students according to their awareness regarding electronic games (n=102).

variables	Studied university students	
Preferred game	**No.**	**%**
PUBG	91	89.2
Medal of Honor	17	16.7
Home escape	24	23.5
Devices used (Multiple response questions)		
Mobile Phone	78	76.5
Laptop	25	24.5
PlayStation	27	26.5
PC computer	29	28.4
Game classification		
Excitement	58	56.9
IQ	69	67.6
Simulation	29	28.4
Sports	43	42.2
Chess / Puzzle	46	45.1
Action	46	45.1
Strategy	32	31.4
Traditional / Cards	35	34.3
Terror	19	18.6
Preferred Place during play (Multiple response questions)		
Home	94	92.2
College	13	12.7
Café	30	29.4
Cyber	17	16.7
Transportation	32	31.4
Talking about game during studying day		
No	15	14.7
Yes	87	85.3
Prefer game over reading or studying		
No	4	3.9
Yes	98	96.1

Table 3: Levels of gaming addiction among studied university students (n=203).

Game addiction	Studied university students	
	No.	%
Non problematic	26	25.5%
Highly engaged	34	33.3%
Problem gamers	25	24.5%
Addicted gamers	17	16.7%

Table 4: Levels of Mindfulness Attention Awareness among studied university students (n=102).

Mindfulness Attention Awareness	Studied university students	
	No.	%
Low level	94	92.2%
High level	8	7.8%

Table 5: Relation between levels of gaming addiction and mindfulness attention awareness among studied university students (n= 102).

Levels of gaming addiction	Studied university students					
	Levels of mindfulness attention awareness				X^2 test	p-value
	Low		High			
	No.	%.	No.	%.		
Non problematic	24	23.5	3	2.9	0.001	0.97
Highly engaged	33	32.4	1	1.0	1.70	0.19
Problem gamers	22	21.6	2	2.0	0.79	0.37
Addicted gamers	15	14.7	2	2.0	0.43	0

P: p value for association between different categories
*Significant at P ≤ 0.05   **** Highly significant at p < 0.001**

7. References

Abdel Raouf, Sh.Y., Gabr, H., Al-wutayd, O., & Al-batanony, M. (2022). Video game disorder and mental wellbeing among university students: a cross-sectional study. Pan African Medical Journal. 41(89) ISSN: 1937-8688.

Ali, f., Kwame, A., Nam, I., Svetlik, M. & Zhong, Y. (2019). The internet of things and benefits at a Glance. International Journal of Science and Engineering Investigations, vol 8, issue 89, Received on June 10, 2019 ISSN: 2251-8843.

Arpaci, I. (2021). Relationships between early maladaptive schemas and smartphone addiction: The moderating role of mindfulness. International Journal of Mental Health and Addiction, 19(3), 778–792. https://doi.org/10.1007/s11469-019-00186-y

Asaad, T., Morsy, K., Hasan, H., Mohamed H. El Din, & Abd- El Meguid,M. (2019). Game addiction scale for adolescents : Addictive disorders and their treatment https://doi.org/10.1097/ADT.0000000000000167**.**

Ayumi, E., Zulkarnain, I., & Hendra, Y. (2019). The relationship of online games addiction with teaching social skills in the communication science students of state Islamic university of north sumatera. Journal Tarbiyah, 26(2.**(**

Backe, H. (2020). Game-comics and comic-games: against the concept of hybrids. In: Comics and Videogames. Routledge, 60–83**.**

Behling, O. & Law, K. (2000). Translating questionnaires and other research instruments: problems and solutions. SAGE Publications, Inc., Thousand Oaks.https://doi.org/10.4135/9781412986 373**.**

Brown, K., & Ryan, R. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. Journal of Personality and Social Psychology, 84, 822–848**.**

Chen, L., Lu, X., Yuan, J., Luo, J., Luo, J., Xie, Z., & Li, D. (2020). A social media study on the associations of flavored electronic cigarettes with health symptoms: observational study. J. Med. Internet Res. 22 (6), e17496 **.**

Choi, T., Park, J., & Kim, D. (2021). The Effect of Stress on Internet Game Addiction Trends in Adults : Mindfulness and Conscientiousness as Mediators. 779–788**.**

Dahabiyeh, L., Najjar, M., & Agrawal, D., (2020). The effect of risk levels on technology adoption decision: The Case of online games. Information Technology and People. Daniel, Journal Education and the COVID-19 pandemic. Prospects 49 (1), 91–96**.**

Dumrique, D. & Castillo.(2018). Online Gaming: Impact on the Academic Performance and Social Behavior of the Students in Polytechnic University of the Philippines Laboratory High School. KnE social science 5(3),1205-1210.doi: 10.18502/kss.v3i6.2447**.**

Egypt Mobile Gaming Statistics (2022). Available at: https://42matters.com/egypt-mobile-gaming-statistics [Accessed march 23 , 2022.**[**

ELNahas, G., Abo Elella, E., Hewedi, D., Elhabiby, M., Elkholy, S., Mansour, O., & Baiumy, S. (2018). Problematic online gaming among a sample of university Students in Egypt. Addictive

disorders & their treatment. https://doi.org/10.1097/ADT.0000000000 000141**.**

Gonzalez-Bueso, V., Santamaria, J., Fernandez, D., Merino, L., Montero, E. & Ribas, J. (2018). Association between internet gaming disorder or pathological video-game use and comorbid psychopathology: A comprehensive review. International Journal of Environmental Research and Public Health, 15(4**.(**

Hosseini, M., Ashktorab, T., Taghdisi, M., Esmaeili, S., & Rafiei, H. (2015). Healthpromoting behaviors and their association with certain demographic characteristics of nursing students of Tehran city in 2013. Global Journal of Health Science 7(2): 264-272**.**

Humayya, A., Windarwati, H., Winarni, I., Brawijaya, U., Brawijaya, U., Windarwati, H., Brawijaya, U., Malang, K., & Info, A. (2022). Journal of Nursing Science Update. 10(1.(

Ismail, N., Tajjudin, A., Jaafar, H., Nik Jaafar, N., Baharudin, A., & Ibrahim, N. (2021). The relationship between internet addiction, internet gaming and anxiety among medical students in a malaysian public university during covid-19 pandemic. International Journal of Environmental Research and Public Health, 18(22). https://doi.org/10.3390/ijerph182211870**.**

Khalil, A., Alharbi, N., Alhawasawi, H., & Albander, A. (2016). Prevalence of Internet Addiction among Nursing Students and the Association with their Academic Performance and Mental Health. Athens Journal of Health, 3(43), 291–306.https://doi.org/10.30958/ajh.3-4-2**.**

Khalil, S. A., Kamal, H., & Elkholy, H. (2020). The prevalence of problematic internet use among a sample of Egyptian adolescents and its psychiatric comorbidities. International Journal of Social Psychiatry,1–7 journals.sagepub.com/home/isp).https://d oi.org/10.1177/002076402098384**.**

Lam, L., Peng, Z.W., & Mai, J.C. (2009). Factors associated with internet addiction among adolescents. Cyber Psychol Behav 12(5):551–555.

Lemmens, J., Valkenburg, P. & Peter, J. (2009). Development and validation of a game addiction scale for adolescents .Media Psychology, 12(1),77-95.Availablefrom: https://www.researchgate.net/publication/282245306_Problematic_digital_gaming_behavior_and_its_relation_to_the_psychological_social_and_physical_health_of_Finnish_adolescents_and_young_adults#fullTextFileContent.

Lenhart, A., Smith, A., Anderson, M., Duggan, M., & Perrin, A. (2015). Teens, technology and friendships. Washington: Pew Research Center Internet & American Life Project. J.3(1)

Lie, W., Garland, E., Mcgovern, P., Brien, J. & Tronnier, C. (2018). Mindfulness-Oriented Recovery Enhancement for Internet Gaming Disorder in U.S. Adults: A Stage 1 Randomized Controlled Trial. HHS Public Access. Psychol Addict Behav., 31(4), 393–402. https://doi.org/10.1037/adb0000269.

Mahmoud, O., Hadad, S., & Sayed, T. (2022). The association between internet addiction and sleep quality among Sohag University medical students. Middle East Current Psychiatry, 0–5. https://doi.org/10.1186/s43045-022-00191-3

Marchica, L., Mills, D., Keough, M., & Derevensky, J. (2020). Exploring differences among video gamers with and without depression: Contrasting emotion regulation and mindfulness. Cyberpsychol Behav Soc Netw; 23:119 25.

Meschtscherjakov, A., De Ruyte, B., Fuchsberger, V., Murer, M., & Tscheligi, M. (2016). Persuasive technology. In 11th International Conference on Persuasive Technology, 9638 (pp. 288–300). https://doi.org/10.1007/978-3-319-31510-2.

Moqbel, M. (2020). Understanding the relationship between smartphone addiction and well- being: the mediation of mindfulness and moderation of hedonic Apps Organism-Response Model Stimulus-. Proceedings of the 53rd Hawaii International Conference on System Sciences |, 3(URI: https://hdl.handle.net/10125/64487 978-0-9981331-3-3 (CC BY-NC-ND 4.0), 6083–6092.

Muhamad, J. & Kim, S., (2020). Serious games as Communicative Tools for Attitudinal and Behavioral Change. The Handbook of Applied Communication Research, pp. 141–162.

Mundy, L., Canterford, L., Hoq, M., Olds, T., Moreno-Betancur, M., Sawyer, S., & Patton, G. (2020). Electronic media use and academic performance in late childhood: a longitudinal study. PLoS One 15 (9), e0237908 .

Naaj, M., & Nachouki, M. (2021). Distance Education during the COVID - 19 Pandemic : The Impact of Online Gaming Addiction on University Students ' Performance. 12(9), 365–372.

Newell, J. (2021). Zooming in ; On Mindfulness and Gaming: The Application Of A Brief, Standardized, Zoom-Based, Mindfulness Intervention On Videogame Play As Compared To A Treatment As Usual Approach. Publishied Doctoral Thesis.

Rawshon, S., Initiative, B., Development, L., Mahmud, I., Ramayah, T., & Toma, T. (2017). Modeling Online Games Addiction Behavior Among University Students why are they so addicted?

Rayan, A., & Ahmad, M. (2018). The psychometric properties of the mindful attention awareness scale among Arab parents of children with autism spectrum disorder. Archives of Psychiatric Nursing, 32(3), 444–448. https://doi.org/10.1016/j.apnu.2018.01.00 1.

Saied, S., Elsabagh, H. & El-afandy, A. (2016). Internet and face book addiction among Egyptian and Malaysian medical students : a comparative study , Tanta University , Egypt Internet and facebook addiction among Egyptian and Malaysian medical students : a comparative study , Tanta University , Egypt. January. https://doi.org/10.18203/2394-6040.ijcmph20161400.

Shi, J., Renwick, R., Turner, N. & Kirsh, B. (2019). Understanding the lives of problem gamers: The meaning, purpose, and influences of video gaming. Computers in Human Behavior, 97, 291–303.

https://doi.org/10.1016/j.chb.2019.03.023.

Singh, S. (2018). Online gaming addiction among adolescents across

gender: A comparative study. International Journal of Home Science (IJHS) 4(3): 128-130;ISSN: 2395-7476.

Sioni, S., Burleson, M. & Bekerian, D. (2017). Internet gaming disorder: Social phobia and identifying with your virtual self. Computers in Human Behavior, 71, 11–1. https ://doi. org/10.1016/j.chb.2017.01.044.

Tolchinsky, A (2013). The development of a self-report questionnaire to measure problematic video game play and its relationship to other psychological phenomena. Unpublished Dissertation, Eastern Michigan University, Ypsilanti, MI.

Tolchinsky, A. & Jefferson, S. (2011). Problematic video game play in a college sample and its relationship to time management skills and ADHD symptomology." Cyberpsychology, Behavior, and Social Networking, 14(9): 489- 496.

Tomaszek, K., & Muchacka-Cymerman, A. (2019). Sex differences in the relationship between student school burnout and problematic Internet use among adolescents. International journal of environmental research and public health, 16(21), 4107.

Spilkova, J., Chomynova, P. & Csemy, L. (2017). Predictors of excessive use of social media and excessive online gaming in Czech teenagers. Journal of behavioral addictions, 6(4), 611-619. https://doi.org/10.1556/2006.6.2017.064.

Sun, X. (2022). A Review of Mindfulness and Social Media Excessive Use. International Conference on Social Development and Media Communication .Advances in Social Science, Education and Humanities Research, volume 631 p(1286– 1294).http://creativecommons.org/licenses/by-nc/4.0./

Syam, H., Effendi, J., Madjid, T., Djuwantono, T., & Permadi, W. (2017). Does Mobile Phone Radiation Affect Sperm Quality ? January. https://doi.org/10.4236/oalib.1103711.

Tang, S., & Kum, C. (2018). Depression and impulsivity mediating the relationship between social anxiety and internet addiction. International Journal ofPsychology & Behavior Analysis.

Urhan, B. & Karcı, H. (2021). Online Game Addiction and Gen Z: A Comparative Study on Turkish and Romanian High School Students. Journal of selcuk communication 2, 14(2), 549–575. doi.org/10.18094/ JOSC.811992 .

Wan Yaacob, W., Zakaria, N. & Mat Aji, Z. (2021). Identification of factors contributing to the online game addiction among adolescents. Journal of Information and Communication technology, 20(4), 565-597. https://doi.org/10.32890/ jict2021.20.4

Yao, Y., Chen, P., Li, C., Hare, T., Li, S., &Zhang, J. (2017). Combined reality therapy and mindfulness meditation decrease intertemporal decisional impulsivity in young adults with internet gaming disorder. Comput Hum Behav 2017;68:210 6.

Zala, D., & Misra, S. (2022). Addiction to Online Video Games among First Year Medical Students of a College located in Western India. Health line, 13(1), 79–82. https://doi.org/10.51957/healthline_258_2 021.