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Internet Addiction and Perceived Self-Efficacy Among University Students

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Abstract
Much concern has been raised of late regarding factors predicting vulnerability to addictive behaviors in general and most recently those related to the newly emerging area of risk of excessive and addictive patterns of use on the internet, including social media and gaming. The current study was designed to investigate the relationship between levels of addictive patterns of internet usage (as related to social media) and perceived self-efficacy among university-aged students in Palestine (a country with some of the highest levels of internet addiction). The sample consisted of 505 university students, selected randomly across area of study. Results indicated a high negative relationship between excessive internet use/addictive patterns of use and perceived self-efficacy. Findings conversely showed no significant differences in internet addiction and perceived self-efficacy dependent on area of study, gender, age or academic level. These conclusions illuminate concerns related to factors of vulnerability as well as possible negative effects of excessive internet use and self-efficacy, especially in the highly sensitive group of university students where behavioral patterns may lead to lifelong habits and/or interfere with developmental and educational tasks and demands. In addition, as self-efficacy is known to be a risk factor in both symptoms of depression and suicidal ideation, further research into this relationship may be critical in devising interventions to both reduce internet addiction and increase self-efficacy during the critical life period of late adolescence.

Keywords Addiction · Internet addiction · Self-efficacy · Late adolescence risk factors

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Introduction

The Internet is a tool that is evolving into an essential part of everyday life all over the world, and its use has increased exponentially in the past decade, especially among young people (McLaughlin and Whitty 2007). Despite the obvious benefits of using internet technology, psychologists and educators have long been concerned about the potential negative impacts of excessive internet/social media use and the related physical and psychological problems which may result (Odaci and Celik 2016). The concept of "internet addiction" has been explored when discussing the risks of excessive internet use patterns. Internet addiction would be defined as a disorder when the internet use pattern is not only excessive but is related to bio-neurological complications, psychological symptoms, and social-relational disturbances. Excessive internet use at the level of addiction continues despite negative consequences, as in other addictive disorders. Internet addiction could emerge as an international concern based on global accessibility and diverse norms of the frequency and intensity of its use, especially in young adulthood where time and energy spent online can have significant negative effects on academics, social relationships, finances, and occupational development (Akin and Iskender 2010). However, not all experts agree that excessive internet use can be equated to an addictive disorder such as alcohol or drug use. In excessive internet use, there are no corresponding physical symptoms of tolerance, withdrawal, or the need for a biological detoxification. Internet addiction is more similar to the already validated behavioral addictions found in gambling, sexual, eating, and gaming disorders, which have been labelled as excessive or obsessive (Kim 2008). Internet use disorder includes a progressive pattern of use, discomfort or distress when use is not possible, and continued use despite negative consequences resulting from use. In light of the formulation of unique and excessive patterns of internet use as an addiction, further exploration is being done to identify the precursors and results of the disordered patterns of use such as self-efficacy, as is explored in the current study (Odaci 2013).

Literature Review

According to the relevant literature (Chiu 2014; Gant and Shaw 2002; Pesigan and Shu 2016), internet use is highest between the ages of 16 and 24, suggesting that high school and university students, who are at a critical stage of their social and emotional development, are the group at highest risk for internet dependence. Internet access for individuals in this age range is generally free, easy, and continually available. University-aged students, especially those living away from home for the first time, are less likely to be monitored and supervised by parents, which may affect the content of use, boundaries/restrictions of use, and the overall amount of time spent using the Internet. These students are more vulnerable to the negative effects of excessive use than their older and younger counterparts, as excessive use may negatively impact grades and social relationships and lead to feelings of distress/lack of emotional well-being (Odaci 2011).

Internet usage may have significant effects on aspects of the social landscape of an individual, especially during developmentally critical time periods of adolescence and early adulthood, such as an increase in negative social comparison, reduction of real social activities, and an increase in symptoms of both depression and anxiety – including social withdrawal in

vulnerable sub-populations. However, it is difficult in this exploration to distinguish personal risk factors and characteristic predispositions for internet addiction and identify negative psychological effects of excessive internet use (Odaci 2011). The dilemma becomes distinguishing the sequence of events and interplay in the acquisition of addiction to identify which characteristics cause the disordered pattern of use vs. which precede current use? (Coombs 2004)

For youth in geopolitically at-risk environments, such as Palestine, the situation is far more complex. Youth residing in the occupied territories of Palestine have high levels of environmental stressors (e.g., militarization, poverty, lack of employment opportunities, cultural pressures, etc.) and fewer positive social outlets due to the restrictions on movement between communities, a lack of recreational facilities, and cultural standards of gender separation. In this situation, the easily accessible and unrestricted opportunities for stress-reducing social contact of social media could lead easily to excessive and maladaptive use in the face of heightened stressors and few alternative avenues for socialization (Mahamid and Berte 2018a, 2018b).

In 2017, Palestine was ranked the eighth on the list of Arab countries related to the percentage of the population using social networking sites, which was measured as 37% (Concepts, 2017). The number of Palestinians using Facebook was calculated in 2019 as 2,346,000 of 5,010,040 million individuals in the West Bank and Gaza Strip (Napoleoncat 2019).

An explorative study, conducted at An-Najah National University (ANNU), demonstrated that more than 47% of students were engaging in addictive patterns of internet use, with social media being the highest ranked category of student internet activity and use for academic tasks or business opportunities falling much lower (Mahamid and Berte 2018a, 2018b).

There are a variety of models proposed to explain the mechanisms that may initially cause an addictive use pattern and then maintain it over time and throughout personal negative impact. Chung et al. (2011) suggest that internet use (specifically gaming) is a way of escaping from both environmental obligations and negative self-reflection. The model supported Baumeister's (1991) "escape from self" theory, implying that individuals with internet addiction are avoiding inner conflicts, negative self-evaluation, and consequent negative emotions, as internet games provide immediate satisfaction at a frequency impossible to recreate in the real world and involve with limited and specific skill sets that improve with practice more effectively than the complex behaviors needed for social, academic, and vocational success.

Bandura (2001), using cognitive-behavioral theory, defines internet addiction as a challenge with self-regulation that may affect all media consumers, including those whose media consumption patterns are generally considered normal. In this model, "symptoms" of addiction are defined as indicators of deficient self-regulation that are found at differing levels among the general population (Eastin et al. 2003).

Cognitive-behavioral models of pathological internet use (PIU) focus on the maladaptive cognitions in individuals that lead to addictive patterns of use. An individual with PIU may believe they are incapable of forming a relationship or attaining a career, leading them to search for success in a virtual world which is less complicated, unilateral, and provides immediate and continual feedback. The initial cognitions are the primary and basic cause of the internet addiction and if not addressed will lead to further and/or diversified addictive behaviors (Davis 2001).

Cognitive distortions about the self lead to self-doubt, low self-efficacy, and negative self-appraisal. The individual who has a negative view of themselves may use technology to

achieve positive social responses in a non-threatening way. Unfortunately, internet success may lead to further distortions such as "I am only good on the Internet," or "I am a failure when I am offline" (Young 2004).

Individuals who are more socially anxious may choose to isolate themselves to avoid anticipated social judgment and eventual rejection and, as a result, may find challenges in establishing positive relationships with others. These individuals may be vulnerable to internet addiction. Initially, increasing social interaction via the Internet may be immediately reinforcing but can become an obstacle as the electronic world becomes a preferred venue for socialization since it requires less risk (Ha et al. 2007).

Considered within the context of social-cognitive theory, self-efficacy is an individual's belief that he/she possesses the skills necessary to perform a task or attain an objective (Bandura 2002). Self-efficacy affects how an individual feels, thinks, and motivates themselves and is a significant determinant of behaviors (Schunk and Pajares 2002).

Self-efficacy affects the role people generally assume socially, and in the face of a particular task, self-efficacy determines how much effort they make, how long they withstand obstacles and frustration, the level of resistance they demonstrate in the face of difficulties, as well as the resulting emotional stress and levels of depression levels they encounter when dealing with environmental demands. According to this theory, individuals avoid tasks that exceed their self-perceived abilities (Bandura 2002). Therefore, an individual who believes they lack the ability to successfully complete a particular task (such as establishing a personal relationship) will exhibit avoidant behavior and instead engage in a well-practiced low-risk internet behavior (such as focusing on a "virtual" friend they can never meet) (Odaci and Celik 2016).

Self-efficacy is a representation of an individual's confidence that they will achieve a positive outcome for their efforts, both in specific areas and as a general expectation of success. These beliefs may inform and dictate a person's choice of activities and the amount of effort expended during performance (Benight and Bandura 2004). Bandura's (2002) social cognitive theory upholds that people's level of motivation, affective states, and actions are based more on what they believe about their abilities than on what is objectively true.

Bandura (2001) claims that efficacy beliefs are the foundation of human "agency," defined as that which enables individuals to exercise control over the nature and quality of their life. Social cognitive theory is rooted in the view that individuals are agents continually engaged in their own development and who make life "occur" by their own actions. As such, self-efficacy beliefs are revealed in the way people respond to an external scenario; those who believe they will succeed expend more energy and interest, which in fact increases the likelihood of a positive result of their actions (Boehmer et al. 2005).

People with consistent and generalized high self-efficacy are inclined to adopt positive problem-focused coping strategies and are better at managing both their behavior and emotional state. Therefore, they appear to be less affected by stressful events. By contrast, people with low self-efficacy are inclined to apply negative coping strategies and engage in negative self-talk, therefore increasing reactivity to stressful events (Bandura 2002; Luszczynska et al. 2005; Schwarzer and Warner 2013). Social self-efficacy is related to "effective" social behavior and has been shown to exert a crucial influence on the likelihood of people self-regulating internet usage (Sari and Aydin 2015). Low social self-efficacy has been shown to be significantly correlated to social anxiety, loneliness, and social dissatisfaction (Andreou et al. 2013; Betz and Smith 2002). In contrast, high self-efficacy has been consistently related to high self-esteem, social and vocational success, as well as positive life satisfaction (Betz and Hermann 2004; Betz and Schifano 2000; Betz and Smith 2002).

A number of studies have investigated the relationship between internet addiction and self-efficacy. For instance, Kim and Davis (2009) showed that low self-efficacy and anxiety were positively related to internet addition. In investigating academic self-efficacy and academic procrastination as predictors of problematic internet use among university students, Odaci (2011) found a significant negative correlation between academic self-efficacy and problematic internet use.

Lee et al. (2001) estimated the prevalence of internet addiction in Korean middle and high school students, who are known to experience excessive academic loading compared to foreign students, and compared demographic factors, internet-use patterns, trait anxiety, depression, and self-efficacy between addicted group and non-addicted groups. Findings indicated that the internet-addicted group demonstrated higher levels of anxiety and depression and lower levels of self-efficacy than those of the non-addicted group.

Irena et al. (2010) conducted a cross-sectional analysis which revealed that time spent browsing the web is positively related to loneliness and negatively related to self-efficacy. However, it is impossible to discern the directionality of this relationship.

In a 2014 study, Chiu indicated that academic stress had negative predictive power for social and learning self-efficacies, interpersonal relationship stress had negative predictive power for social self-efficacy, and social self-efficacy had positive predictive power for smart phone addiction (in another words, those with better self-perceived social skills were more likely to exhibit excessive phone use).

Conversely, in relation to phone use, there has been a variety of findings that show the opposite. For instance, Bianchi and Phillips (2005) found that low self-esteem positively predicted excessive mobile phone use, while Ha et al. (2008) reported a positive correlation between mobile phone addiction, depressive symptoms, higher interpersonal anxiety, and lower self-efficacy, whereas, Walsh et al. (2011) revealed that self-identity predicted young people's phone addiction. In Hong et al. (2012) study, social extraversion related positively to phone addiction, whereas self-esteem had negative effects on mobile phone addiction. Furthermore, high anxiety was found to significantly predict smartphone addiction (Esen and Gundogdu 2010).

Sari and Aydin (2015) examined the role of self-efficacy in adolescent internet addiction. The findings demonstrated that general self-esteem, social self-efficacy, family-home self-esteem, and total self-esteem were significantly and negatively correlated with internet addiction.

In testing the relationship between internet addiction and other psychological problems, Yao and Zhong (2014) showed that excessive and unhealthy internet use increased feelings of loneliness over time, and low self-efficacy had a moderate and positive bivariate relationship with internet addiction.

Halley et al. (2014) tested the effect of internet addiction among 131 Portuguese school children and adolescents. Results demonstrated that internet addiction could be predicted using a model encompassing three variables: weekly internet usage, negative self-efficacy, and classroom behaviors.

Finally, Esen and Gundogdu (2010) investigated the relationships between internet addiction, self-efficacy, and social support among adolescents. The findings from this study revealed that internet addiction decreased with lower peer pressure and increased self-efficacy. Furthermore, it was observed that internet addiction scores of adolescents differed with gender, with scores for girls being generally lower than those for boys.

The Study

Self-efficacy is a critical motivational state for university students, due to developmental challenges that require taking risks and exploring new roles and skills in the evolution toward adulthood. For many, this period is unique and includes the experience of living away from home for the first time, learning about what is socially acceptable among new peers and adjusting to new environments, starting study in a career of choice, and increasing academic challenges. The current study sought to explore the relationship between self-efficacy and internet use in a group of university students in Palestine, which has been found to have one of the highest internet addiction rates in the Arab world. The goal of this investigation is to better identify risk factors for individual students, as well as inform educational institutions to assist them in managing these high-risk behavioral patterns within the developmentally vulnerable population in their care.

Research Hypotheses

The study was based on the following hypotheses:

1. Self-efficacy is negatively associated with internet addiction among Palestinian university students.
2. The lower the self-efficacy, the more internet addiction Palestinian university students would have.

Research Questions

Specifically, this study was designed to answer the following questions:

1. What is the degree of internet addiction in Palestinian university students?
2. Are there general differences in internet addiction among student participants related to gender?
2. Are there general differences in self-efficacy among student participants related to gender?
4. Is there a significant correlation between internet addiction and self-efficacy?

Methodology

Participants

Participants were selected using a simple random sampling technique of ANNU students through compulsory course class lists, using every 4th student to solicit for study purposes. Five hundred five students participated, including 270 males and 235 females between the ages of 18 and 24 (M = 20.59, SD = 2.13). 23.5% of the participants were freshman, 22.8% sophomores, 16.7% juniors, 19.6% seniors, and the remainders were in their fifth year or beyond. More than 30 % were of low socioeconomic status, 55% were of middle socioeconomic status, and the remainders were of high socioeconomic status. Participation was voluntary. The population was selected from those who agreed to answer the questionnaire. The sample was

approximately 3% of current ANNU students; 650 questionnaires were distributed and 505 were completed and analyzed. The study was submitted for review by An-Najah Institutional Review Board (IRB) and received approval before data collection was initiated.

Data Collection

The Internet Addiction Test (IAT), created by Kimberly Young (2012), was used to measure the level of addictive internet behaviors. It consists of 20 items that measure mild, moderate, and severe levels of internet addiction. Examinees responded to each statement with a number from 1 to 5 on a Likert scale continuum, indicating the extent to which they engage in a particular behavior. The IAT views internet addiction as an impulse-control disorder, where the term "internet" refers to all types of online activity. Mahamid and Berte (2018a, 2018b) validated the scale in a Palestinian context by using construct and content validity, the scale ended with 19 items to test internet addiction, and Cronbach's alpha coefficients also indicated high internal consistency for the total scale (0.87).

The scale includes information on demographics, internet usage, and perceived negative effects of internet use on personal performance. The scale measures internet use according to the following criteria:

1. Controlled Use (20–49 points): Average online use may include periods of excessive internet use, but use is generally within expected quantity and without negative social, vocational, economic or academic consequences.
2. Occasional to Frequent Problem Use (50–79 points): Occasional negative impact of internet use or frequent excessive use without impact.
3. Significant Problematic Use (80–100 points): Internet use causing significant problems or life challenges, including distress when unable to use and continued use despite negative impact.

The perceived self-efficacy test, developed by Abu Ghazal and Alawneh (2010), was used to measure the level of perceived self-efficacy. It consists of 40 items that measure perceived self-efficacy among university students. Examinees responded to each statement with a number from 1 to 5 on a Likert scale continuum, indicating the extent to which they endorse that particular belief. A committee of 10 experts in psychology reviewed the items of the scale for content validity and comprehensiveness. The researchers used a score of 80% agreement between experts for the inclusion of each item. Accordingly, minor modifications were made on the basis of feedback from the committee members. In order to test reliability of the scale, Cronbach's alpha formula used among a sample of 60 university students independent of the study sample (reliability sample); Cronbach's alpha coefficients indicated high level of reliability for the total scale (0.82).

Research Procedures

The research was conducted in 2018 and lasted for 5 months. After obtaining the needed clearances from the (IRB) at An-Najah National University, the sample was selected through

compulsory course class lists, using every 4th student to solicit for study purposes. One of the authors visited students in classes and explained the aims of the research, with a focus on the voluntary nature of participation; 650 questionnaires were distributed and 505 were completed and analyzed.

Statistical Analysis

Means, standard deviations, and percentages were used to test the degree of internet addiction in university students, whereas an independent samples T-test was used to test the differences in self-efficacy and internet addiction due to gender. Person's correlation coefficient was also conducted to test the relationship between internet addiction and perceived self-efficacy among participants, and a regression analysis was performed to test the causal relationship between self-efficacy and internet addiction among university students.

Results

Internet Addiction Test (IAT)

1. Results of the first question: What is the degree of internet addiction in Palestinian university students? To answer this question, means, standard divisions, and percentages were used. Participants' mean responses were in the range of online usage on items 3, 4, 7, 8, 9, 12, 14, 17, 18, and 19. Responses were in the range of frequent problems on items 1, 2, 5, 6, 10, 11, 13, 15, and 16. The total score of the Internet Addiction Test was in the level of frequent problem usage. Table 1 shows the detailed answers on internet usage.

A total of 505 out of 650 participants returned valid questionnaires, resulting in a response rate of 78%. When asked about average internet usage, approximately 49% of the respondents scored in the range of mild (internet usage may include periods of excessive use, but it's generally without negative social, vocational, economic, or academic consequences), 45.2% scored within the range of moderate (experiencing occasional or frequent problems because of the internet), and 5.8% fell into the category of severe/addicted (internet usage causes significant problems in the life of the user).

2. Results of the second question: Are there general differences in internet addiction among student participants related to gender? To answer this question, IAT scores were analyzed by gender in an independent samples T-test. Results show significant differences between males and females with the total score of males use being significantly higher than females. Details are shown in Table 2.

Perceived Self-Efficacy Test

3. Results of the third question: Are there general differences in self-efficacy among student participants related to gender? To answer this question, perceived self-efficacy scores were analyzed by gender in an independent samples T-test. Results show no significant differences between males and females. Details are shown in Table 3.

4. Results of the fourth question: Is there a significant correlation between internet addiction and self-efficacy? To answer this question, the relationship between internet usage and

Table 1 Means, standard deviations, percentage, and degree of participants on Internet Addiction Test

No	Item	M	SD	Percentage%	Degree
1	How often do you find that you stay online longer than you intended?	3.43	1.26	68	Frequent problem
2	How often do you neglect household chores to spend more time online?	2.60	1.24	52	Frequent problem
3	How often do you form new relationships with fellow online users?	2.25	1.30	45	Online usage
4	How often do others in your life complain to you about the amount of time you spend online?	2.44	1.40	48	Online usage
5	How often do your grades or school works suffer because of the amount of time you spend online?	2.68	1.39	53	Frequent problem
6	How often do you check your email before something else that you need to do?	2.83	1.51	56	Frequent problem
7	How often does your job performance or productivity suffer because of the Internet?	2.46	1.30	49	Online usage
8	How often do you become defensive or secretive when anyone asks you what you do online?	1.99	1.23	39	Online usage
9	How often do you block out disturbing thoughts about your life with soothing thoughts of the Internet?	2.08	1.30	41	Online usage
10	How often do you find yourself anticipating when you will go online again?	2.70	1.31	54	Frequent problem
11	How often do you fear that life without the Internet would be boring, empty, and joyless?	2.70	1.44	54	Frequent problem
12	How often do you snap, yell, or act annoyed if someone bothers you while you are online?	2.47	1.28	49	Online usage
13	How often do you lose sleep due to late-night log-ins?	3.20	1.39	64	Frequent problem
14	How often do you feel preoccupied with the Internet when offline or fantasize about being online?	2.11	1.26	42	Online usage
15	How often do you find yourself saying “just a few more minutes” when online?	3.52	1.35	70	Frequent problem
16	How often do you try to cut down the amount of time you spend online?	2.92	1.40	58	Frequent problem
17	How often do you try to hide how long you’ve been online?	2.00	1.31	40	Online usage
18	How often do you choose to spend more time online over going out with others?	1.86	1.20	37	Online usage
19	How often do you feel depressed, moody, or nervous when you are offline, which goes away once you are back online?	1.80	1.11	36	Online usage
	Total score	2.52	1.31	50	Frequent problem

Table 2 Independent samples T-test on internet addiction according to gender

Variable	Mean	SD	T. Value	DF	Sig
Male	2.76	0.70	4.52	503	0.000***
Female	2.52	0.68			

****p* < 0.001

perceived self-efficacy was calculated by using Pearson's correlation coefficient; results show a significant negative correlation between internet usage and perceived self-efficacy. Details are shown in Table 4.

The regression analysis for predicting internet addiction found that perceived self-efficacy contributed in a way that was statistically significant toward explaining the variance in internet addiction (B = 0 0.31, SE = 0.06, β = − 0.28**). Details are shown in Table 5.

Discussion

The current findings support previous studies, demonstrating that excessive and problematic internet use had a significant and negative relationship to self-efficacy in a university student population in Palestine. This correlation was not influenced by either field of study or gender; however, excessive and problematic use was generally found to be higher in males. Interestingly, there was no difference in self-efficacy beliefs demonstrated between genders, despite the commonly held belief that women in Arab or Muslim countries are traditionally submissive/suffering from issues of low self-esteem. It must be noted that the sample consisted of university students and not the general population, so the results in this area may be influenced by the education and economic level of the women sampled.

It was also found that there was no significant relationship between self-efficacy and internet use when looking at a full sample of internet users, which is to say the relationship was evident only in samples with moderate and problematic internet use, thereby confirming the first hypothesis of the study that self-efficacy is negatively associated with internet addiction among university students. Low self-efficacy in adolescents and young people may contribute to problematic habits such as internet addiction. People with low self-efficacy may demonstrate a lack of communication and social skills; as a result, these individuals may resort to alternative venues for socialization that feel less threatening to them, such as social media. Previous studies have indicated a significant negative correlation between self-efficacy and internet addiction (Chiu 2014; Kim and Jeong 2011; Odaci 2011). Results of these studies show that social self-efficacy in the real world (i.e., offline) was negatively related with the degree of internet

Table 3 Independent samples T-test on perceived self-efficacy according to gender

Variable	Mean	SD	T. Value	DF	Sig
Male	2.95	0.19	4.52	503	0.53
Female	2.93	0.23			

Table 4 Person's correlation coefficient between perceived self-efficacy and internet addiction

Internet addiction	Perceived Self-Efficacy	
	R	P
Online users	– 0.10	0.141
Occasional to frequent problem use	– 0.30	0.000***
Significant problematic use	– 0.45	0.000***

****p* < 0.001

addiction, whereas social self-efficacy in the virtual world (i.e., online) indicated a positive association with internet addiction.

Results also confirm the second hypothesis of this study: the lower the self-efficacy, the more internet addiction Palestinian university students had. Self-efficacy is the self-judgment of an individual's ability to organize and perform behaviors necessary to achieve certain outcomes. The current findings align with previous studies that showed internet addiction was negatively associated with self-efficacy (Akin and Iskender 2010; Craparo et al. 2014; Odaci 2013). Results of these studies revealed that self-efficacy accounted for a significant percentage of the variance for total problematic internet usage.

The limits of the present research must be noted. First, the representation of the sample is limited by age, vocation, education level, and somewhat by economic status, as all participants were full-time students at a major university, which by definition eliminates uneducated, working, or highly impoverished individuals. Findings may be significantly different if the sample was expanded to include the general population. Further, the methodology relies completely on self-report measures of both self-efficacy and addictive behaviors. Self-efficacy is an abstract concept, which in itself is difficult to attach to an operational definition and traditionally challenging to predict actual behavior. It is unclear what level of correspondence exists between student reports and actual patterns of thought and subsequent behavioral reasons, especially given the anomalous results that both males and females had equal levels of self-efficacy. The Internet Addiction Test is also based on self-report, with response items that are obvious in demarcating problematic behaviors. Students, knowing that university personnel would be examining the results, may have been hesitant to report their internet behaviors accurately or may be in denial about the amount and effects of their individual internet use. This may explain the low level of students that self-reported high levels of problematic behaviors, despite previous research that measured Palestinian internet addiction levels as the highest in the Arab world. These factors must be taken into consideration when examining the results.

Table 5 Regression to predict internet addiction

Predictor	B	*B*	SE	ΔR2
				0.26**
Perceived self-efficacy	0.31	− 0.28**	0.06	

***p* < 0.01

The findings however remain clear in the negative relationship between self-efficacy and problematic internet use. The question at hand remains the path and sequence of this relationship and how it can be mediated in populations that are at risk for addiction due to stage of development, level of environmental risk, and clinical presentation of depression, anxiety, and other mental health vulnerabilities.

Internet addiction, like other self-harming behavioral patterns, has been shown to be affected by three major sets of variables: individual predisposition via psychological risk factors including depression (Odaci 2013), anxiety, immature coping skills, biological predisposition to addictive behavior patterns, lack of social connectivity (Akin and Iskender 2010), and, including the current study, lack of self-efficacy (Chiu et al. 2013); environmental factors such as increased pressure, lack of alternative activities, and geopolitical conflict; and actual prevention measures taken by families, institutions, or societies to inform about dangers, reduce access to the internet, and offer treatment interventions for early stages of excessive or problematic use.

The challenges with the investigation of internet addiction are varied. Most current studies are retroactively looking at current characteristics (such as depression or self-efficacy) and current usage (Yu et al. 2015). It is impossible to ascertain if the characteristics noted are then a preemptive vulnerability, a negative consequence of excessive internet use, or a feedback loop where both existing risk factors and negative results create a continual positive or negative effect. In addition, it would almost be impossible at present to study the emergence of internet behavior as most children are exposed long before school-age, thereby making the process difficult to monitor and study.

Despite consistent scientific findings of the negative impact of excessive internet use, the general public does not yet seem to accept that there is a problem. Children at every level of society are exposed to electronic devices at a much younger age and with less and less supervision over the frequency and content of their internet use, despite the American Medical Association (AMA) directives. Adults of every developmental stage are increasingly using the internet to manage a variety of life functions, including work, finance/banking, leisure plans, social networking, shopping, getting directions while driving or walking, making food orders, games for fun, skill building, monitoring exercise, etc. The impact of modeling electronic behaviors has not yet been an area of study but can be clearly observed within families and societies where development is now defined in levels of electronic access. The number of appliances owned in a household that are connected to the internet has also increased significantly: phones, computers, televisions, tablets, smart watches, etc. There is very little data on the negative impact of long-term excessive internet use on economic standing, family stability, and physical health. In addition, there are no regulations or monitoring systems in place at a societal or governmental level investigating the question of internet addiction. In most environments, excessive use is taken as a joke or minor annoyance that gets little attention.

In summary, our work to examine, predict, and mediate internet addiction will be significantly hampered by the lack of familial, community, and governmental recognition of the serious impact of the issue and commitment to its remediation at this time and in the future.

Recommendations

In order to combat the personal and community effects of internet addiction, further research is needed to understand developmental norms for internet use, the individual and environmental

risk factors for addiction, how to identify early signs of problematic use, how to improve self-efficacy as a method to reduce internet addiction in adolescents, the physical consequences of excessive use (at both the neurological and systemic levels), and what treatment strategies are needed to regulate internet use in a world that is increasingly electronic.

For the community at large, increasing awareness of the impact of excessive internet use is needed, especially highlighting the power of social modeling on children and adolescents from both peers and adults. Actual restriction of both internet-accessible appliances and network connectivity in public and educational spaces, as well as offering alternative activities, are also areas of need.

Universities are institutions with a highly vulnerable population in regards to internet addiction and therefore have a vested interest of the subject. Compulsory workshops or classes focusing on self-efficacy, internet use, appropriate time management, and concepts of internet addiction are highly recommended for all campuses. Increasing electronic- free environments and activities would provide alternatives to internet distraction. Educating parents and families about the dangers of excessive internet usage and restricting internet appliances and networks on campus are additional suggestions.

At a societal level, larger institutional examination and governmental policy is needed to monitor and control the goals and limitations of internet use in all areas of life, as well as looking into the future and understanding clearly the economic and educational effects of the internet around the globe.

Conclusion

The current study supported previous findings demonstrating that self-efficacy was significantly and negatively related to excessive and problematic internet use. While it is clear that efforts to increase both cognitive and experiential exercises in self-efficacy would be beneficial for all children, the fact remains that excessive internet use needs to be addressed as a potential risk factor for the psychological and physical well-being of the global population.

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