
Anxiety, Internet Addiction and Depression in Emerging Adults: A Mediational Perspective

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Original Article

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Keywords

Anxiety, depression, internet addiction, mediation, emerging adults.

Abstract

The major aim of the present study was to find out the relationship among anxiety, internet addiction and depression in a sample of emerging adults. More specifically, the study was intended to find out the mediating role of internet addiction in the relationship of anxiety and depression. The study followed a correlational research design where the participants were approached using purposive sampling. Participants were recruited from a public sector university of Multan city. Their ages ranged between 18 to 25 years of age with $M = 21.38$ and $SD = 1.90$. Beck Anxiety Inventory, Internet Addiction Test and Beck Depression inventory were used to measure anxiety, internet addiction and depression respectively. The data was analyzed through SPSS and Model 4 of Process Macro by Hayes. The results confirmed that anxiety not only is a direct positive predictor of depression but is also linked through internet addiction. The study has important implications for behavioral addiction researchers and practitioners, and generally for clinical psychologists and psychiatrists. In the end, limitations and suggestions for future research have also been discussed.

Introduction

The recent era of pandemic can be marked as an era of uncertainty and change. Due to severe attack and sudden wave-change of COVID-19, the masses have witnessed truly unpredictable changes and chaos. During this period, almost 130 countries restricted the normal day-to-day activities at varying levels, and almost 3 billion people around the globe were asked to not to leave their homes and 1.25 million deaths were attributed to the virus (Lin, 2020; OECD, 2020). Along with many other changes, such orders resulted in shift of everyday activities from physical to online mode. People tended to shop online, visit doctors online, work online, study online and play online. Although previously, use of internet was an option, in these days, it increased dramatically in this era. According to a study, the prevalence rate of internet addiction was 24.4% in Taiwan during March 2020 (Lin, 2020). Internet addiction was reported to have increased almost 2.5% ending up in a prevalence of 8.6% in youth of Japan (Oka et al., 2021). These suggest that COVID-19 has substantially affected the level of internet addiction particularly in youth. The present study evaluates how mental health issues including

depression and anxiety affect or are affected by internet addiction. Moreover, the researchers want to study the role of internet addiction in mental health issues of depression and anxiety.

Mental Health Issues in Emerging Adults in COVID-19

The uncertainty, unpredictability, health and life related chaos and other factors associated with COVID-19 have resulted in many health and wellbeing related issues particularly for the youth. Youth is an age range that is highly susceptible to mental health issues. The developed amygdala and the developing prefrontal cortex make them more vulnerable to think more emotionally and less rationally (Santrock, 2011). This may lead them to have mental health issues including stress, anxiety, depression, personality related disorders and many more. The pandemic has even left the youth with more mental health issues. They are more likely to develop depression, anxiety, stress, and use of alcohol and other psychoactive drugs than ever before (Jones et al., 2021). Other mental health issues such as suicidal ideation and suicidal attempts, depressive mood and problematic lifestyle habits are even worse outcomes of COVID-19 witnessed in youth (Lee et al., in Press). Other mental health issues such as grief, helplessness, shame, anxiety, stress, substance abuse, panic attacks, fear, anger, worry, loneliness and stigma might also be attributed towards the devastating outcomes of COVID-19 (Mukhtar, 2020).

Anxiety and Internet Addiction

Anxiety is among the most common mental health issues. The uncomfortable and worry feelings accompanied by nervousness about the danger about current or future events are termed as anxiety (Bouras & Holt, 2007). It is characterized by the personal feelings of uneasiness, future-oriented uncertain and intrusive thoughts and mental and physical reactions that are uncontrollable and non-adaptive (Xi, 2020). Youth is a period of life when there is a higher risk of developing anxiety. They may feel body changes, and or may feel anxious towards these changes; They may be anxious about how their body looks and feels, they may have doubts about social acceptance; and finally, they have conflicts on their independence (American Academy of Child and Adolescent Psychiatry, 2022). In order to cope with this anxiety, the adolescents and early adults may turn towards different coping strategies including both positive and negative ones. One of these coping strategies is the use of the internet. Use of the internet may contribute many positive outcomes for youth such as fulfilling their social needs, providing them a sense of connectedness and belongingness with being less inhibited and intimidated (Shepherd & Edelmann, 2001; Stritzke et al., 2004; Shepherd et al., 2005).

The most common type of internet addiction is internet gaming addiction (Kishi et al., 2009). Online games can also be a source of recreation, refreshment and thus, a temporary escape from the anxiety the youth experiences. Social anxiety has often been attributed towards the excessive use of internet gaming (see for example Shepherd & Edelmann, 2001; Nasution et al., 2019) however, other forms of anxiety or general anxiety are often neglected in this regard. Internet addiction has been found to be a safeguard against social anxiety since it provides a means of socializing without feeling it distressing and can find a sense of social control and find social benefits through internet use such as gaming (Shepherd & Edelmann, 2001). Although previously the correlation between anxiety and internet addiction and its types is established (Carras et al., 2020; Kim et al., 2016) however, little is known about the role of anxiety in predicting internet addiction. The researchers in this field (Huang et al., 2022) have suggested conducting more research in outlining if the symptoms of anxiety raise the risk of internet addiction and related disorders (such as IGD).

Internet Addiction and Depression

Like all other addictions, internet addiction provides a source of temporary relief from stressors and anxiety provoking thoughts. However, it is associated with many negative outcomes. For example, loneliness, decreased life satisfaction, impaired social competence, increased impulsivity, poor

academic achievement, increased aggression and many more (Gentile, 2009; Griffith et al., 2012; Lemmens et al., 2009). Many of these issues such as loneliness, decreased life satisfaction and poor academic performance are often seen in depression. Therefore, internet addiction may pave way to increased depression and has often been found as a correlate of depression. Mentzoni et al. (2010), for instance concluded that internet gaming addiction is a positive correlate of depression however, this positive correlation disappears as soon as the gamer stops the gaming (Brunborg et al., 2014). Stockdale and Coyne (2018) also found that internet addicts particularly those who have gaming addiction have impaired cognitive functioning, poor mental health and more emotional difficulties. These mental health issues may put the addicts at higher risk of developing symptoms of depression.

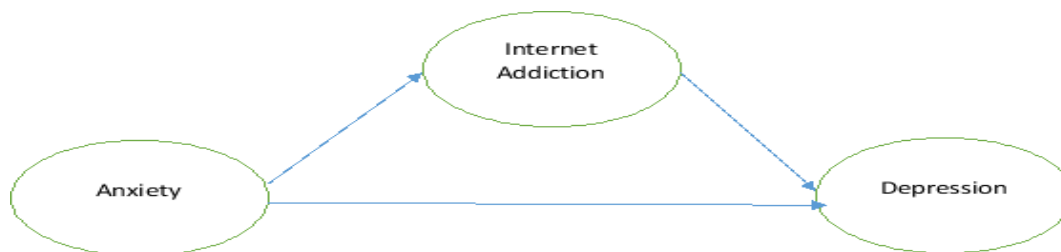
Anxiety, Internet Addiction and Depression

The relationship of anxiety and depression are well documented in literature. These two disorders are comorbid in such intensity that the individuals having anxiety disorders such as social anxiety disorders have 20% to 70% chances that they will develop a depressive disorder sooner or later in the life (Dunner, 2001; Ned & Kelin, 2020). During the course of development, anxiety disorders precede depressive disorders as the onset age of anxiety disorders is preadolescence as well as early adolescence; whereas, depression emerges later during adolescence or early and middle and adulthood hence leaving emerging adulthood as a risk-factor of depressive disorders (Beesdo, Knappe, & Pine, 2009; Kessler & Wang, 2008; Ohayon & Schatzberg, 2010). However, the linking mechanism is still unclear. One possible reason behind the relationship of the two can be attributed to internet addiction. Although the three have been found related with one another in one way or the other, there is little consensus on the nature of the relationship of the three. Taechoyotin et al. (2020) for instance made an endeavor to study the relationship of the three and found strong relationships between the three but could not conclude the causal relationship among the three.

We propose that in order to cope with anxiety, the individuals turn towards internet addiction as a source of escape. This is in line with traditional escape hypothesis of addiction which suggests that addiction may result in escape of reality and thus escapism may be an initial motive of addiction, or it results in reinforcing the addictive behavior as addict may get out of the anxiety of reality (Jouhki & Oksanen, 2022). This perception of the anxious may lead him to become involved in internet addiction. However, internet addiction is associated with mental health issues particularly depression. Internet addiction particularly IGD is linked with lowered density of grey matter in the left dorsolateral prefrontal cortex, and this lowered density of grey matter has been attributed towards the mental health issues such as depressive symptoms. Moreover, it is associated with reduced right nucleus accumbens which is also associated with lifetime depression (Choi et al., 2017). Therefore, we hypothesize that

H1: Internet addiction will mediate the relationship of anxiety and depression in emerging adults.

Figure 1 Conceptual Framework of the Study



The figure 1 portrays the conceptual framework of the study which summarizes that anxiety predicts depression through internet addiction.

Method

This section concludes the methodology opted in the study. Information on study design, sample, instruments and procedure are summarized in this section:

Research Design

The major aim of the study was to find out the relationship between anxiety and depression as well as to conclude the mediating role of internet addiction in the stated variables. In order to meet this objective, the study followed a correlational research design with survey as a research strategy.

Sample

The sample of the current study comprised emerging adults (N = 310) with age range of 18 to 25 with M = 21.38 and SD = 1.90. The sample included girls (n = 209) and boys (n = 101). The participants were recruited from a public sector university of Multan city who were approached using purposive sampling technique. Only those participants were recruited in the sample who were using the internet for more than 6 hours a day outside the university on regular bases as being online more than 6 hours after university is linked with depression (Madhav et al., 2017). Since the study was correlational in nature and diagnosis or labelling was not a concern of the study, no cut-off score was made and participants were not labeled as moderate or high addicts. The detail of the demographic characteristics is as follows

Table 1
Demographic Characteristics of the Participants

Demographics	<i>f</i>	%
Gender		
Boys	101	32.6
Girls	209	67.4
Education		
Intermediate	53	17.10
BS	198	
Masters	59	19.03
Family System		
Nuclear	225	72.6
Joint	85	27.4

The Table 1 enunciates that sample comprised more girls than boys and most of them had completed their BS degree and that a higher proportion of the participants was from nuclear family system.

Instruments

In order to measure the constructs of the study Beck Anxiety Inventory, Internet Addiction Test and Beck Depression Inventory were used. The detail of these measures is as follows:

Beck Anxiety Inventory

Beck Anxiety Inventory was developed by Beck and Steer in 1993. The scale consists of 21 items which are to be responded to on a Likert scale with a range from 0 to 3 where 0 indicates rarely and 3 indicates most of the time. The scale is psychometrically sound and reliable measure as it shows good Cronbach alpha (ranging from .92 to .94) and test-retest reliability with an interval of one week i.e., .74 (Grant, 2011). Although the scale gives cut-off scores for mild, moderate and high levels of anxiety, in the present study no cut-off scores were used since it was a correlational study and diagnosis was not a matter of concern.

Internet Addiction Test

Internet Addiction Test (Young, 1998) is a psychometrically sound measure of internet addiction. It comprises 20 items which are in easy and simple English. The items are to be responded to on a Likert Scale ranging from 0 to 5. Higher score indicates higher internet addiction whereas low scores

indicate lower level of internet addiction among the respondents. The scale has excellent psychometric properties since its Cronbach alpha, as reported by Samaha et al., 2018 was .91.

Beck Depression Inventory-II

Beck Depression Anxiety is one of the most widely used measures of depression. It was constructed by Beck et al. (1996) and consists of 21 items to measure the level of depression among participants. All the items are to be responded on a Likert Scale ranging between 0 to 3 where 0 states not at all whereas 3 states severely. The scale is a reliable and valid measure of depression as its reported Cronbach alpha is 0.90 (Toledano-Toledano & Contreras-Valdez, 2018).

Procedure

The present study followed a correlational research design. After review from the departmental ethics and research committee, the topic was approved by the Board of Studies of a public sector university in Multan. In order to collect data, the researcher personally visited a public sector university. After the permission letters were signed from the respective authorities, the students were approached in their classrooms through purposive sampling. Only those students were recruited in the sample who had full time access to the internet and those who played internet games on daily bases. The participants were informed about their rights of confidentiality and voluntary participation in the research and that they will not be given any incentive for participation in the research. It took 10 to 15 minutes for the participants to respond to the questionnaires. In the end the researcher thanked the participants.

Results

In order to test the hypotheses, several statistical analyses were carried out including Pearson correlation, Cronbach Alpha, and Multiple Regression Analysis through Model 4 of Process Macro by Hayes. The results are summarized in the following section.

Table 2
 Anxiety, Internet Addiction, and Depression (N = 310)

Variables	Anxiety	Internet Addiction	Depression	M	SD	Cronbach's α
Anxiety	--	--	--	1.91	.63	.93
Internet Addiction	.30***	--	--	2.75	.92	.89
Depression	.55***	.27***	--	1.88	.60	.92

The Table demonstrates the relationship of anxiety, internet addiction, and depression in a sample of university students. The results reveal that anxiety, depression and internet addiction are positively related with one another. Moreover, as depicted in the table, all the scales have excellent Cronbach alpha and therefore are psychometrically sound and reliable measures.

Table 3
 Standardized Path Coefficients for Direct and Indirect Effects of Anxiety on Depression through Internet Addiction (N = 300)

Paths	Outcome Variable	Predictor Variable	B	95%CI	
				LL	UL
a	Internet Addiction	Anxiety	.44***	.28	.59
b	Depression	Internet Addiction	.08*	.02	.14
c	Depression	Anxiety	.49***	.42	.63
d	Depression	Anxiety through internet addiction	.03 ^a	.02	.09

^aThe value of upper and lower limit indicates that the relationship is significant

Table 2 summarizes the results of Model 4 carried out by Process Macro by Hayes. The results reveal that Anxiety is a significant positive predictor of internet addiction. The path b states that internet addiction significantly predicts depression. Path c states that anxiety strongly and positively predicts depression while, as the upper and lower limits suggest, it also positively predicts depression through

internet addiction. Moreover, anxiety contributes for 8% variance in internet addiction ($R^2 = .08$) whereas anxiety and internet addiction together contribute for 31% variance in the depression ($R^2 = .31$)

Discussion and Conclusion

During the pandemic years, the whole world went into an “internet mode” which although brought many positive outcomes, resulted in some negative consequences too. One such negative consequence was Internet addiction which has been a matter of attention for researchers for several decades. Most of the researchers have focused on adolescents as they are perhaps the most vulnerable population of this addiction. However, this trend is equally common in other populations which are often neglected. Present study is an endeavor to see the role of internet addiction in a sample of emerging adults.

Several researchers have concluded a strong relationship between anxiety and depression. Many theories may also explain the association of the two however, little is known about the role of internet addiction between the two. Present study has concluded that internet addiction acts as a mediator between the two. Table 3 indicates that although the direct relationship of anxiety and depression is significant, the indirect relationship through internet addiction is also significant which indicates that among many mechanisms behind the relationship of the two, internet addiction may also play a linking role. As we have earlier discussed, during this era of pandemic especially, the youth has to face many problems and stressors. As an avoidant coping strategy, they may turn towards internet addiction. This escape-avoidance role of internet addiction was confirmed by Melodia et al. (2022) who conducted a meta-analytic study and concluded that escape-and-avoidance motives can be precursors of problematic internet use. Further, this internet addiction paves the way to structural changes in the anatomy of the brain which ultimately may result in increased depression (Darnai et al., 2019). Further, if we follow the escape-avoidance hypothesis, the escape or avoidance can end up in nothing except for even worsening the situation. Carvalho (2011) asserted that the escape-avoidance behaviors (such as different forms of addictive behaviors) may momentarily reward the individual however, they may result in maintaining or even onset of depression.

To conclude, the individual with anxiety may turn towards internet addiction in order to avoid thinking about the stressors; however, they are still there; and avoiding them or escaping from them ends up in nothing except making the stressors even more stressful, and the result is increased depression.

Limitations and Suggestions

Although the study was carefully designed and carried out, there can be several limitations of the study. The first and foremost problem was the use of purposive sampling as the researchers only recruited those emerging adults who were playing online games on regular bases therefore, it was not feasible to control several other factors such as gender and family system. Further, it was correlational study but neurological studies and experimental studies may also be designed to see if there is any neurological evidence behind this relation.

Implications

The study offers important implications for researchers as well as practitioners in fields of behavioral addiction and mental health counselors. The researchers can perform neurological and experimental studies as well as study other addictions (particularly behavioral addictions) as linking mechanisms between anxiety and depression. The practitioners may work on treatment of behavioral addictions more specifically the internet addiction in order to cure the comorbidity of anxiety and depression. Parents can also be alert for depressive symptoms if they find excessive use of the internet by their children. Finally, the emerging adults can also benefit from this research by targeting their internet addiction if they find anxiety and depression related issues for themselves.

Originality

This research focuses on emerging adults, a demographic that is uniquely positioned between adolescence and full-fledged adulthood. This age group faces distinct challenges and transitions that make them particularly susceptible to mental health issues and behavioral addictions.

By adopting a mediational perspective, this study aims to explore not just the direct relationships between anxiety, internet addiction, and depression, but also the intermediary mechanisms or variables that may explain how these relationships operate. This approach can uncover deeper insights into the causal pathways and underlying processes.

Declarations

Availability of data and materials

The data that supports the findings of this study is available with the corresponding author on reasonable request.

Authors' consent for publication

All authors gave their consents to publish this manuscript.

Ethical approval

Ethical approval was obtained, Department of Applied Psychology, Bahauddin Zakariya University Multan.

Participants' consents:

Each participant gave written consent to participate.

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