
INTERNET ADDICTION AS AN OUTCOME OF FEAR OF MISSING OUT AND BELONGINGNESS NEEDS AMONG UNIVERSITY STUDENTS: INTERNALIZING PROBLEMS AS A MEDIATOR

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ABSTRACT

With the rise of technology in today's modern world, the Internet offers educational benefits but also results in addictive behaviors among university students. The present study examines the predictive role of fear of missing out and belongingness needs and the mediating role of internalizing problems in internet addiction among university students. The researchers collected data from 300 university students using a demographic questionnaire, the Fear of Missing Out Scale, the Need to Belong Scale, the Depression, Anxiety, and Stress Scale, and the Chen Internet Addiction Scale. Two separate models were tested. Findings show that high fear of missing out and unmet belongingness needs predicted internalizing problems (i.e., depression, anxiety, & stress) and internet addiction among university students. Internet addiction increased by 32% with the interaction of predictor and mediator in both models. Universities can use these results to design prevention and intervention programs targeting students' well-being and academic success.

KEYWORDS

Belongingness, fear of missing out, internet addiction, internalizing problems, university students

INTRODUCTION

Internet addiction is defined as “*an excessive, compulsive, and uncontrollable use of the Internet that causes significant distress and impairments in daily functioning*” (Young & Abreu, 2011, p. 4). The convenience and pleasure derived from internet use can result in individuals becoming addicted to online activities to satiate demands. Such behaviors pose new difficulties to societies around the world. It is widely regarded as a severe disorder as substance addiction because of the similarity in neural impairment and dysfunctions that each category of addiction causes (Cash et al., 2012). Internet addiction also encompasses a variety of addictions mediated by electronic media. Shopping, virtual sex, games, social network services (SNS), cell phones, online gambling, cyber-relationships, and file downloading are examples of these addictions (Mihajlov & Vejmelka, 2017). Previous literature has plenty of studies about the positive and negative outcomes of the Internet; there are a few studies on its predictors, such as how relatedness needs lead to excessive Internet use and abuse. Two such constructs are fear of missing out and belongingness, due to which people in general, and university students in particular, urge to stay connected with their surroundings via internet use. Research has verified the link between FoMO and belongingness needs.

LITERATURE REVIEW**Fear of Missing Out and Internet Addiction**

It is an innate human need to build social relationships and seek pleasurable social experiences. Though FoMO is not limited to social media use, Przybylski et al. (2013) first used this term to delineate a concern that others may be socially satisfying while one is missing out. Later, Zhang et al. (2020, p. 1620) defined FoMO as “*a fear of missing an experience that can help an individual maintain or enhance their private/public self.*” They extrapolated two dimensions of private (personal) and public (social) FoMO as individuals sense social and personal exclusion that can contribute to their personal or social goals (Zhang et al., 2020). The private self is about how an individual wants to develop and preserve one's identity upon missing a social event. It develops through daydreams, meditation, and self-reflection. The social self refers to how others perceive an individual when s/he misses a social opportunity. Such feelings include but are not limited to fear, anxiety, sadness, hopelessness, disappointment, and regret (Zhang et al., 2020). In the light of the self-determination theory, Deci and Ryan (1985) postulated that human beings have an innate motive to socially connect with people around them to avoid feelings of missing out on what others are doing (Przybylski et al., 2013).

The onset of internet and social media addiction is reported to occur in the late 20s or early 30s age group. University students more often use smartphone devices because of their portability and affordability. They are compelled to use the Internet for fear of not missing out on knowledge about their surroundings and people. Przybylski et al. (2013) first examined the correlates of FoMO among first-year university students. Gezgin et al. (2018) discovered that those aged 21 reported the highest amount of FOMO. The Compensatory Internet Use (CIUT) theory posits that an individual uses the Internet to combat stressful life experiences and seek pleasure (Kardefelt-Winther, 2014). In other words, low need-satisfaction with relatedness leads to FoMO and social media engagement so students can connect with others and deepen social ties.

Emerging adulthood is marked by instability in different facets of life. Previous research with college/university students has identified a direct association of FoMO with excessive Internet and social media use when students are in the developmental stage of emerging adulthood (Elhai et al., 2016). Other studies found that FoMO is linked with nomophobia, which is a fear of losing smartphone and social connectivity (Gezgin et al., 2018); problematic smartphone use (Göksun, 2019); social media use (Alabri, 2022); and overall internet addiction (Hadiyah et al., 2022). Another study found that higher levels of FoMO are associated with higher levels of internet addiction and were, in turn, associated with poor psychological symptoms among Turkish undergraduate students (Metin-Orta, 2020). Another Turkish Study found a significant mediating effect of interaction anxiety on the association between FoMO and smartphone addiction among university students (Buyukbaryakta, 2020). Notwithstanding, FoMO predicts compulsive Internet use that, in turn, significantly triggers social media fatigue, during which addicted users experience anxiety disorder and depression in using social media sites and staying online (Dhir et al., 2018).

Belongingness Need and Internet Addiction

The belongingness needs refer to human intrinsic motivation and the emotional need to affiliate with and be accepted by group members (Deci & Ryan, 2000). It can also lead to changes in behaviors, beliefs, and attitudes as people strive to conform to the standards and norms of the groups. The inability to meet belongingness needs results in isolation, loneliness, and rejection (Deci & Ryan, 2000). Belongingness is also explained through Maslow's needs hierarchy theory, implying that human beings have a motive to affiliate with social groups and to be valued when physiological and safety needs are satisfied. Goodenow (1993) defined belonging in educational environments as "*students' sense of being accepted, valued, included, and encouraged by others (teacher and peers) in the academic classroom setting and feeling oneself to be an important part of the life and activity of the class.*" *More than simple perceived liking or warmth, it also involves support and respect for personal autonomy and the student as an individual*" (p. 25). While belongingness is defined in several ways, scholars

consider it critical for students' academic motivation, success, and overall well-being (Goodenow, 1993).

Internet use provides such a rewarding experience that students feel obligated to glimpse videos, comments, updates, and posts to prevent losing out on any information. They feel isolated from the social world, and their need for belonging is thwarted without internet use (Begley, 2017). A study found that social media use was associated with a sense of belongingness, online self-presentation, and social support. Moreover, self-presentation and perceived social support were mediators in association between social media use and belongingness (Pang, 2020). Babayigit et al. (2022) reported that smartphone addiction is negatively linked with belongingness and positively linked with perceived stress in university students. Given that students plausibly use the Internet as a source of information for positive and negative goals, high and low Internet usage have varied impacts on college belongingness and mental health. Satici et al. (2023) reported that belongingness and problematic internet use have a significant negative connection, and belongingness was found to strongly predict problematic internet use. Problematic internet use indirectly affects the association between belongingness and the mental well-being of university students.

Internalizing Problems and Internet Addiction

Internalizing problems can be defined as negative emotions (such as sadness, guilt, and worry) directed toward oneself to cope with stressful situations and circumstances (Salavera et al., 2019). They can cause an individual to mentally withdraw from his/her surroundings and feel responsible for unpleasant external situations. They occur because people have trouble coping with negative emotions or stressful situations, lack social skills, and manage their feelings poorly (Salavera et al., 2019). Several studies have examined the association between internet addiction and internalizing mental health issues. De Leo and Wulfert (2013) investigated college students' problematic internet use to internalizing (depression & social anxiety) and externalizing (substance use & other dangerous behaviors) problems. Results show that internet use is more strongly associated with internalizing than externalizing problems. Another study found a strong positive association between internet addiction and multiple psychopathologies, such as anxiety, depression, and suicidal ideation (Akgönül et al., 2015). Ostovar (2016) reported internet addiction as a significant positive predictor of anxiety, stress, depression, and loneliness in Iranian adolescents and early adults. Longitudinal studies have also reported an over-time association between the two variables. Banyai et al. (2017) supported the longitudinal association between internet addiction and negative mental health outcomes such as stress, anxiety, and depression. They also added that internet addiction was negatively associated with well-being over time because students anxiously waited for people to like and comment on their postings (Bányai et al., 2017).

Receiving fewer likes, views, and comments from contacts causes stress (Begley, 2017). Other mental health concerns include nomophobia (Gezgin et al., 2018), phubbing or snubbing others via smartphones (Al-Saggaf & O'Donnell, 2019), and increased procrastination (Li et al., 2020). College students with severe mobile phone addiction who used their phones for more than 4 hours every day were more likely to develop symptoms of anxiety, depression, loneliness, hopelessness, social anxiety, etc. (Mei et al., 2022). Satici et al. (2021) indicated that depression, anxiety, and stress partially mediated the impact of smartphones on relationship satisfaction.

The Current Study

Previous studies have shown that many psychological variables cause internet addiction, but studies related to fear of missing out, belongingness needs, and internalizing problems are quite limited among university students. The current study's goal is to gain a better insight into the psychological mechanisms that lead to the negative effects of internet addiction owing to fear of missing out and belongingness needs. This study will not only emphasize the role of FOMO and the belongingness needs of internet addiction for the given population, but it will also strengthen previous research on the subject. The findings will provide insight into how unmet relatedness needs and internalizing problems contribute to developing internet addiction. University administrators, instructors, and students' parents can use these data to meet students' relationship needs, psychological well-being, and Internet use.

RESEARCH OBJECTIVES

1. To examine whether fear of missing out and belongingness needs predict internet addiction among university students.
2. To study the mediating role of internalizing problems in the association with fear of missing out, belongingness needs, and internet addiction among university students.

RESEARCH HYPOTHESES

1. Fear of missing out and belongingness needs to positively predict internalizing problems among university students.
2. Fear of missing out and belongingness needs positively predict internet addiction among university students.
3. Internalizing problems mediate the association of fear of missing out, and belongingness needs with internet addiction among university students.

RESEARCH METHODOLOGY

The current study design is a quantitative, cross-sectional survey. This study was conducted on university students in the Haripur district. A convenient nonprobability sampling technique has been used to gather data from the sample of (N=300)

undergraduate university students. The sample comprised 50% (n=150) girls and 50% (n=150) boys. Both male and female adult students of the university within the age range of 18 to 26 years and currently enrolled in undergraduate programs are included in the study.

Adult university students above 26 years enrolled at the undergraduate level are excluded from the study. Table 1 shows that most students (53.3%) are 19-21 years old, and 62.3% live in a nuclear family setting. About 65% of students study in the 5-8 semesters, and 81% have a 3-4 CGPA. It also shows that 33.3% of participants use the Internet for 2-5 hours daily.

Table 1: Frequencies and Percentages as Demographic Characteristics of Participants (n=300)

Demographics	n	%
Gender		
Boys	150	50.0
Girls	150	50.0
Age Range		
19-21	160	53.3
22-24	140	46.7
Semester		
Junior (1-4)	105	35.0
Senior (5-8)	195	65.0
CGPA		
1-2	4	1.3
2-3	53	17.7
3-4	243	81.0
Family System		
Nuclear	187	62.3
Joint	113	37.7
Internet Usage Hours		
<2	38	12.7
2-5	100	33.3
5-8	86	28.7
8-11	47	15.7
>11	29	9.7

Note. N = number of participants.

DATA ANALYSIS AND RESULTS
Fear of Missing Out Scale (FoMO) Scale

Mazlum and Atalay (2022) developed a 17-item FoMO scale to assess the degree of fear of missing out among Turkish university students. It has two factors: the nine items measure the private factor, and the eight measure the social factor. These items are responded to on a five-point Likert scale ranging from “completely agree” (5) to “completely disagree” (1). The FoMO scale does not have any negatively worded items. A total score ranges between 17-85, with a higher score indicating a higher fear of missing out.

Need to Belong Scale (NTBS)

Leary et al. (2013) developed a 10-item scale to measure acceptance and belongingness needs among adults. Respondents choose from strongly disagree (1) to strongly agree (5), where a low score indicates a low need for belongingness. The total scale score range is 10-50.

Depression, Anxiety, and Stress Scale (DASS- 21)

Lovibond and Lovibond (1995) developed the Depression, Anxiety, and Stress Scale (DASS-21) with 21 items to examine three factors of depression, anxiety, and stress. Each factor consists of 7 items and is responded to on a four-point Likert scale from 0-3. Respectively, the response options include "did not apply to me at," "applied to me to some degree, or some of the time," "applied to me to a considerable degree or a good part of the time," and "applied to me very much or most of the time." The total score ranges between 0-63, with different cut-off points for depression, anxiety, and stress.

Chen Internet Addiction Scale (CIAS)

Chen et al. (2003) developed a self-report questionnaire to measure the severity of internet addiction. CIAS has 26 items across five dimensions. These dimensions are compulsive use (5 items), withdrawal (5 items), tolerance (4 items), problems in interpersonal relationships (7 items), and health/time management (5 items). The items are responded to at a four-point Likert scaling, which is "*does not match my experience at all* (1)", "*probably does not match my experience* (2)", "*probably matches my experience* (3)", and "*definitely matches my experience* (4)".

The total score ranges between 26 to 104. The higher score indicates a more severe internet addiction. A score of 64 and above refers to being an internet addict.

Demographic Information Form

The demographic information form comprised essential items related to the participants' information. It included the following variables: participant's sex, age, semester, GPA/CGPA, family system (nuclear or joint), daily internet usage in hours, and social networking sites in use.

Procedure and Ethical Considerations

The present study is conducted in the Spring of 2023. Approval of the Ethics Review Committee of the University of XYZ was sought for data collection from undergraduate students at the university. Participants were approached on campus and briefed about the purpose of the research. The willing students filled out written informed consent. They were assured of data confidentiality and withdrawal opportunities from research participation at any time according to their free will. Respondents completed all questionnaires and demographic forms on average in 20-25 minutes.

Statistical Analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 26. Initially, data were screened for missing values and outliers using histograms and normality curves. The assumption of normality was also checked through skewness and kurtosis. The alpha coefficient was computed to determine the internal consistency of the scales and subscales. Descriptive statistics, correlation, regression, and mediation analysis were performed. Study hypotheses were tested via regression and mediation models using Hayes Process Macro v4.

Results

Table 2 displays the descriptive statistics and alpha coefficient for study variables. Participants’ scores on all study variables were above average and represented moderate levels of FoMO, belongingness needs, internalizing problems, and internet addiction. Overall, university students had a mean score of 59.17 (SD = 17.68), and scores of 64 and above are classified as internet addicts. Therefore, it is interpreted that university students have moderate to high levels of internet addiction.

Table 2: Descriptive Statistics and Alpha Coefficient of the Scales (n=300)

Measures	K	M	SD	Min	Max	Skew	Kurt	α
FoMO	17	52.01	12.12	17	85	-.29	-.04	.91
Belongingness Needs	10	31.59	7.10	10	50	-.36	.34	.73
Internalizing Problems	21	23.12	13.99	0	63	.29	-.71	.93
Internet Addiction	26	59.17	17.68	26	104	.23	-.22	.95

Note: M = Mean, SD = Standard Deviation, Min = Minimum, Max = Maximum, FoMO = Fear of Missing Out.

The FoMO Scale, DASS-21, and CIAS have high internal consistency, and their alpha values are >.90. The Need to Belong Scale has a good alpha coefficient value

($\alpha=.73$) for Pakistani university students. The skew and kurtosis values also lie within the range of normality and indicate a normal distribution of the data.

The present study has two predictors. Therefore, two models are separately tested. Model 1, as shown in Figure 1, tests the effects of FoMO on internet addiction through internalizing problems. Table 3 shows that with one standard deviation increase in FoMO among university students, internet addiction increased by .45 standard deviations ($\beta =.45, p < .05$), and internalizing problems increased by .50 standard deviations ($\beta =.50, p < .05$). The R^2 values show that FoMO explained a 20% variance in internet addiction and a 25% variance in the internalizing problems. Altogether, both predictors explained a 32% increase in internet addiction and accounted for a .56 correlation between the observed and predicted values of internet addiction.

Table 3: Direct and Indirect Effects of Fear of Missing Out, Belongingness Needs, and Internalizing Problems on Internet Addiction (n=300)

Model 1		95% CI		R	R²
Direct Effects		LL	UL		
FoMO ® Internet Addiction	.45*	.50	.80		.20
FoMO® Internalizing Problems	.50*	.46	.69		.25
Indirect Effects					
FoMO	.25*	.21	.53		
Internalizing Problems	.39*	.36	.63		
FoMO ® Internalizing Problems ® Internet Addiction				.56*	.32
Model 2					
Belongingness Needs® Internet Addiction					
Belongingness Needs® Internet Addiction	.44*	.84	1.35		.19
Belongingness Needs® Internalizing Problems					
Belongingness Needs® Internalizing Problems	.46*	.71	1.11		.21
Indirect Effect					
Belongingness Needs	.26*	.37	.90		
Internalizing Problems	.40*	.37	.64		

Belongingness Needs	.57*	.32
® Internalizing		
Problems ® Internet		
Addiction.		

*** $p < .001$. Note. CI = confidence interval.

Model 2, as shown in Table 3 and Figure 2, tests the effects of belongingness needs on internet addiction through internalizing problems. It appeared as a significant positive predictor of internet addiction ($\beta = .44, p < .05$) and internalizing problems ($\beta = .46, p < .05$) among university students. Belongingness needs explained a 19% variance in internet addiction and a 21% variance in internalizing problems. The variance explained in the mediation model was 32%, and internet addiction increased with the interaction of both variables. It implies that university students who feel a need to belong and also have internalizing problems of depression, anxiety, and stress are more likely to have frequent and severe internet addiction. The correlation ($R = .57$) between the observed and predicted values supports the significant positive role of both variables in predicting internet addiction. In sum, both FoMO and belongingness needs predicted internalizing problems and internet addiction among university students.

Figure 1: Direct Effect and Indirect Effect Model for Fear of Missing Out and Internalizing Problems on Internet Addiction

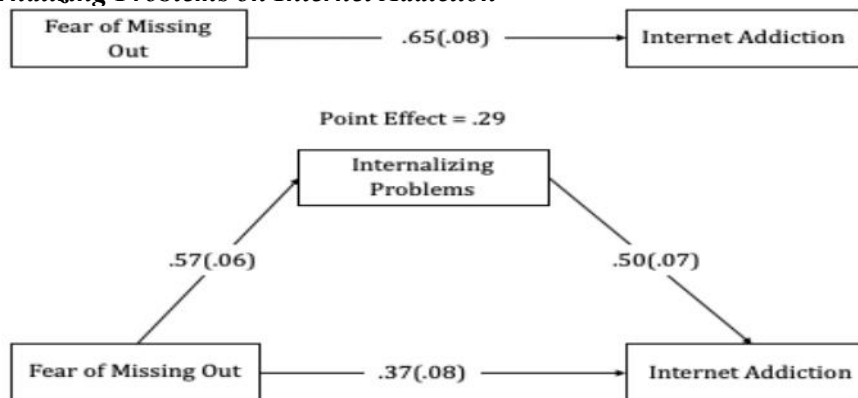


Figure 1 shows that the unstandardized beta value of FoMO was .65 (SE = .08) when it was regressed on internet addiction, which dropped with the inclusion of internalizing problems as a mediator in the model. The direct effect of FoMO ($B = .37$) and the indirect effect of FoMO through internalizing problems ($B = .29$) on internet addiction are significant. It is inferred that the internalizing problem is a significant positive mediator of the association between FoMO and internet addiction.

Figure 2: Direct Effect and Indirect Effect of Belongingness Needs and Internalizing Problems on Internet Addiction

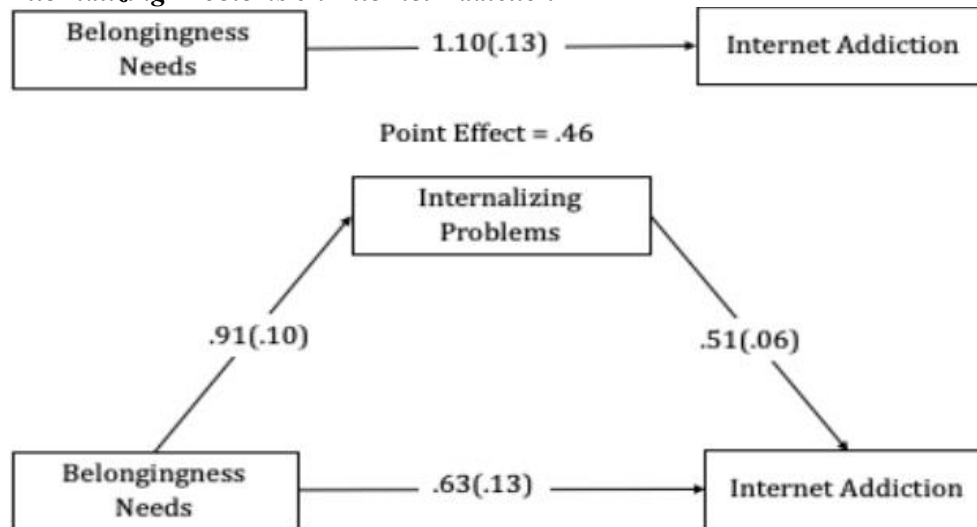


Figure 2 shows the direct and indirect effects of belongingness needs through internalizing problems of internet addiction. The direct effect ($B = .63$) and indirect effect ($B = .46$) of belongingness needs on internet addiction is significant. These findings confirm the mediating role of internalizing problems among university students on the association between FoMO and Internet addiction as well as between belongingness needs and internet addiction.

DISCUSSION

The primary purpose of this study was to discover the role of fear of missing out and the need for belongingness in predicting internet addiction among university students. It was hypothesized that university students with high FoMO and belongingness need to report higher levels of depression, anxiety, and stress that, in turn, is associated with higher levels of internet addiction among university students. As findings show, both FoMO and belongingness needs have direct positive associations with internalizing problems among university students. The high level of these two variables also predicts the high level of internet addiction among university students. FoMO and belongingness needs are also indirectly related to university students' internet addiction through internalizing problems in a positive direction. These findings broadly provide empirical support to all three hypotheses.

Human beings are inherently motivated to relate with others and develop social connections. In university education, students are not fearful of disconnection from others or missing out on important information, and they also have a high sense of

belongingness with others. They are motivated to learn, complete college education, and earn a degree that increases their goal motivation. Such students have better personal well-being and are socially and emotionally well-adjusted on campus with peers, teachers, and others. On the contrary, those with low or no sense of belonging do not relate to others on campus and do not feel happy or adjusted to a university environment. They need more motivation to stay in university to complete their degree. Our findings show that high FoMO and poor sense of belongingness cause depression, anxiety, and stress among university students. Because of the perception of a less accepting environment, social and academic challenges, and perceived discrimination, university students report having high levels of FOMO and poor belongingness needs that lead them to experience internalizing problems. These results support the first hypothesis and align with Satıcı et al. (2023) and Metin-Orta (2020).

FoMO and belongingness must create discomfort and cause behavioral and developmental problems among students. Students do not actively participate in academic and non-academic activities and face negative personal, social, and emotional outcomes. One such negative outcome is internet addiction among university students. Overtime repetitions of internet use cause internet addiction, and students resort to excessive internet use on smartphones, tablets, and computers. Our findings support the second hypothesis that FoMO and belongingness needs have a direct positive relationship with internet addiction among university students. Internet addiction increased by .45 standard deviations to FoMO and .44 standard deviations to belongingness needs. Previous studies confirm the direct positive association of internet addiction with FoMO (e.g., Hadiyah et al., 2022) and belongingness needs (Rashid et al., 2019). These results are also consistent with compensatory internet use theory, which conceptualizes internet use as a substitute for something that is needed but not available. Individuals with high FoMO are more likely to engage in behaviors designed to avoid FoMO.

The third hypothesis is based on the mediating role of internalizing problems in the association of FoMO, and belongingness needs with internet addiction. The results support that internalizing problems have mediated the relationship between fear of missing out and internet addiction as well as belongingness needs and internet addiction. When internalizing problems were added to these models, the regression coefficients between FoMO and internet addiction decreased from .65 to .37. The direction of the relationship remained positive, and internalizing problems adversely affected this association. Likewise, the association between belongingness needs and internet addiction dropped from 1.10 to .63. It implies that emerging adults place a high value on social relationships and interconnectedness in collectivist Pakistani culture. As the sense of belongingness is a protective factor against their involvement

in negative behaviors, university students consider it an essential need. The sources of belongingness and target agents for fear of missing out are not traced to whether students place more importance on inside or outside university relationships. Still, these findings affirm their significance for university students' social life and mental health.

FoMO and belongingness reflect relatedness needs. Satisfying these needs plays an adaptive role in an individual's health and well-being. In contrast, unmet needs lead to experiencing maladaptive and counterproductive outcomes. The present study provides empirical evidence that high levels of FoMO and poor belongingness needs significantly predict internet addiction and mental health concerns, e.g., depression, anxiety, and stress among university students. Findings also support the significant mediation effect of internalizing problems in this association. Research results can be used to implement effective strategies to boost university students' well-being and academic success. The university faculty, administrators, and counseling service staff can utilize these findings to promote self-regulated learning among students and create awareness about the problems associated with internet addiction.

RECOMMENDATIONS

An essential contribution of the present study is unveiling the adaptive or maladaptive role of motive for relatedness in predicting internalizing problems and internet addiction among students in a Pakistani university. All measures are valid and reliable with excellent internal consistency. Nevertheless, this study has certain limitations, such as using a cross-sectional design and one-time assessment, self-reported data, sampling one university, and omitting the investigation of social background variables. This study relied on convenience sampling of undergraduate students at one university, limiting the findings' generalizability to the same context. Future researchers should plan longitudinal studies to observe fluctuations in belongingness needs and overtime changes in the agents of socialization, e.g., peers, teachers, etc. The outcomes and patterns of interaction with different agents of socialization should be explored inside and outside the university. Moreover, the FoMO and belongingness needs may systematically vary due to socio-demographic differences among students, e.g., first-year, first-generation, minority, rural, disabled, and unprivileged students cannot be treated the same as others when investigating their social relatedness in university. Having multiple informants and checking congruence across self-reported and other-reported data can deepen the breadth of understanding of the phenomena under study.

Theoretical and Practical Implications

The present study broadens insight into the link between relatedness needs and mental health problems among emerging adults. Theoretically, the interrelationships among

FoMO, belongingness needs, internalizing problems, and internet addiction are empirically established, laying the ground for more research on the different dimensions of these constructs in predicting adaptive and maladaptive behaviors. Practically, the present study benefits in three ways. First, universities should regularly screen and monitor students' sense of belongingness, FoMO, and the frequency and severity of mental health concerns. Early detection of individuals prone to or suffering from negative behavior can guide counselors and clinical practitioners in offering timely help. Second, universities can use screening data to identify and behaviorally profile students with different needs and motives. Third, prevention and intervention of problem behaviors can be applied through campus involvement, creating social networks with faculty, peers, and administration, active participation in societies, counseling, mentoring, and ensuring an accepting university environment. The administrators and instructors should intervene to ensure balanced use of in-class and out-of-class mobile learning to facilitate learning and communication.

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