Personality traits, social support, and psychological distress as predictors of internet addiction among emerging adults

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ABSTRACT

Objectives: To examine the relationship between internet addiction (IA), personality traits, interpersonal support, and psychological distress among male and female adolescents and young adults in Pakistan; and to assess whether IA mediates the relationship between interpersonal support and psychological distress.

Methods: This cross-sectional survey was conducted among 300 university students (150 males, 150 females), aged 15–30 years, from four Islamabad-based institutions. Standardized tools were used: Internet Addiction Test (IAT), Big Five Inventory (BFI-44), Interpersonal Support Evaluation List-12 (ISEL-12), and a 10-item Psychological Distress Scale. Data were analyzed using SPSS, employing descriptive statistics, Pearson correlations, hierarchical regressions, and mediation analysis.

Results: IA showed significant negative correlations with agreeableness, conscientiousness, extraversion, and openness to change, and a significant positive correlation with psychological distress. Neuroticism was positively associated with psychological distress (r=.45, p <.01) but did not correlate significantly with IA. Hierarchical regression analysis identified agreeableness (β = −0.17, p=.005) as a negative predictor and psychological distress (β=0.19, p=.005) as a positive predictor of IA. Mediation analysis showed IA partially mediated the relationship between interpersonal support and psychological distress (β=−0.04; 95% CI [−0.08, −0.006]). Gender comparisons revealed that males reported significantly higher IA scores (p=.001), while females scored higher on neuroticism and openness to change. Effect sizes indicate moderate gender differences in these domains.

Conclusion: The findings highlight the interplay between personality traits, social support, and psychological well-being in predicting IA. Interventions aimed at enhancing interpersonal support and addressing psychological distress may mitigate IA risk, particularly in male university students.

Keywords: Internet Addiction Disorder (MeSH); Psychological Distress (MeSH); Social Support (MeSH); Personality Traits (MeSH).

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INTRODUCTION

Psychological distress is a key factor contributing to various psychiatric and psychological disorders. In recent years, with the growing accessibility of the internet, particularly during the COVID-19 pandemic, adolescents and young adults have become increasingly vulnerable to internet addiction (IA).[1] IA is a behavioral disorder marked by a compulsive, poorly controlled urge to use the internet, leading to emotional instability, impaired functioning, and disrupted social and family relationships.[2] Concerns regarding the psychological consequences of excessive internet use began to surface in the mid-1990s, as the popularity of the World Wide Web grew rapidly.[3]

IA is now recognized as a form of behavioral addiction that can interfere with daily functioning. Research highlights its strong association with psychological distress and impaired interpersonal relationships[4] While the internet remains a powerful tool for communication, education, and entertainment, its excessive use, especially in virtual socialization, can erode real-life interpersonal bonds.[5] This is particularly relevant for adolescents and university students, who rely heavily on the internet for academic and social engagement.[6]

Among the factors associated with IA, personality traits have emerged as significant predictors. The Five-Factor Model (Big Five) describes five key domains of personality: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness.[7] Studies indicate that people with neurotic personality traits and heightened anxiety regarding online social interactions are more prone to developing IA. Their emotional instability and increased sensitivity to interpersonal social stress in virtual settings increase their vulnerability to compulsive internet use.[8] Moreover, traits such as openness to experience, conscientiousness, and extraversion have also been linked to higher risk, while agreeableness appears to be protective.[9] Evidence further suggests that individuals with severe IA are more likely to exhibit high levels of neuroticism, lower extraversion, impaired family functioning, and greater exposure to stressful life events compared to non-addicted peers. Those with mild addiction also tend to have increased neuroticism and face more challenges related to health and daily adaptation.[3] Adolescents with difficulties in interpersonal relationships-such as aggression, mistrust, or social withdrawal-may turn to excessive internet use as a substitute for real-life interaction.[10] Furthermore, poor mental health has been linked with higher rates of IA, reinforcing a vicious cycle of emotional distress and virtual overdependence.[11]

Despite extensive international literature on IA, there remains a notable gap in understanding its psychological and social determinants within the cultural context of Pakistan. Only a

limited number of studies have explored the complex interplay between personality traits, interpersonal support, and psychological distress among university students in the country.[12-14] Emerging academic observations indicate a growing prevalence of problematic internet use in this population, raising concerns about its potential impact on mental health and interpersonal functioning.

The study is informed by two theoretical frameworks. Diathesis-Stress Model[15] posits that psychological vulnerabilities, such as certain personality traits, interacting with environmental stressors, like low social support, to precipitate behavioral disorders including IA. In parallel, the Uses and Gratifications Theory[16] explains how individuals actively engage with media, including the internet, to fulfill needs related to identity, emotional relief, and social connection.[9] Together, these models offer a comprehensive understanding of both internal predispositions and external influences shaping internet use behavior.

Given the increasing reliance on digital media among adolescents and young adults in Pakistan, this study was planned to examine the relationship between IA, personality traits, interpersonal support, and psychological distress. It further explores whether IA mediates the association between interpersonal support and psychological distress and assesses gender differences across these variables.

METHODS

This cross-sectional study was conducted from September 2022 to February 2023 on 300 university students (150 males and 150 females), aged 15 to 30 years, recruited from four universities, including International Islamic University Islamabad, Air University Islamabad, Quaid-i-Azam University, and COMSATS University Islamabad, Pakistan. Ethical approval for the study was obtained from the Institutional Ethical Committee of the International Islamic University, Islamabad (Letter No. IIUI/ORIC/Bioethics/110, dated February 11, 2022).

This study employed a cross-sectional survey design to test the following hypotheses:

Hypotheses: H1: There is a positive relationship between neuroticism and IA and a negative relationship between extraversion, agreeableness, conscientiousness and IA.

H2: Neuroticism and psychological distress positively predict IA.

H3: Extraversion, agreeableness, openness to change, conscientiousness and interpersonal support negatively predict IA.

H4: IA mediates the relationship between interpersonal support and psychological distress.

H5: Males will be higher on IA in compassion to females.

Sample: Data were collected from 300 university students recruited from four institutions in Islamabad: International Islamic University, Air University, Quaid-e-Azam University, and COMSATS University. The sample comprised 150 males and 150 females, aged between 15 to 30 years (Mean = 25.22, SD = 0.35), with education levels ranging from intermediate to Msc. The sample size was estimated using the OpenEpi calculator, with a 95% confidence interval and 50% power of the test.[17] Participants provided informed consent, and confidentiality of their responses was assured. Data collection was conducted online using the following standardized instruments:

I. Internet Addiction Test (IAT): IA was assessed using the 20-item IAT developed by Kimberly Young (1998).[18] This 6-point Likert scale classifies internet use into three categories:

- Mild addiction: scores 31–49
- Moderate addiction: scores 50–79
- Severe addiction: scores 80–100[19]

II. Big five inventory (BFI-44): Personality traits were measured using the 44-item Big Five Inventory (BFI), which evaluates five dimensions: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism.[20] Responses were recorded on a 5-point Likert scale ranging from 1 (strongly

disagree) to 5 (strongly agree).

III. Interpersonal support evaluation list-12 (ISEL-12): Perceived social support was assessed using the 12-item version of the Interpersonal Support Evaluation List.[21] This version includes three subscales and uses a 4-point Likert scale (0= definitely false to 3=definitely true), with total scores ranging from 0 to 36.

IV. Psychological distress scale:[22] Psychological distress was measured using a 10-item scale assessing depression and anxiety symptoms.[22] Each item is rated on a 5-point Likert scale. The scale has demonstrated high internal consistency (Cronbach's α= 0.93).

RESULTS

The results of the study include descriptive statistics, intercorrelations among the variables, and hierarchical regression analyses examining personality traits, psychological distress, and interpersonal support as predictors of IA among adolescents and young adults. Gender differences within the sample were also assessed. All analyses were conducted using SPSS software.

The results of the study are organized across four domains: descriptive statistics and correlations, hierarchical regression analysis, mediation analysis, and gender differences.

Descriptive statistics and correlations: The study instruments demonstrated acceptable reliability, with Cronbach's alpha values ranging from 0.47 (conscientiousness) to 0.85 (internet addiction) [Table I]. IA showed significant negative correlations with agreeableness ($r = -.22$), conscientiousness ($r = -.11$), extraversion ($r = -.09$), and openness to change ($r = -.05$). Neuroticism was not significantly associated with IA. Interpersonal support was positively correlated with agreeableness ($r = .34$), extraversion ($r = .30$), conscientiousness ($r = .16$), and openness ($r = .20$), but negatively with neuroticism ($r = -.19$) and internet addiction ($r = -.16$), indicating that greater social support was linked to lower IA.

Table I: Descriptive statistics, reliability, and correlations among study variables (n=300)

S.No	Scales	M (SD)	α	I	II	III	IV	V	VI	VII	VIII
I	Extraversion	3.15 (.60)	.50	-	.23**	.25**	-.20**	.16**	30**	-.09	-.24**
II	Agreeableness	3.69 (.57)	.56	-	-	.15**	-.16**	.21**	34**	-.22**	-.17**
III	Conscientiousness	3.29 (.54)	.47	-	-	-	-.21**	.13**	16**	-.11	-.22**
IV	Neuroticism	3.14 (.77)	.70	-	-	-	-	.15**	19**	-.13**	-.45**
V	Openness to change	3.53 (.54)	.54	-	-	-	-	-	20**	-.05	-.15**
VI	Interpersonal Support	1.86 (.50)	.72	-	-	-	-	-	-	-.16**	-.28**
VII	Internet Addiction	2.26 (.77)	.85	-	-	-	-	-	-	-	-.22**
VIII	Psychological Distress	2.49 (.70)	.82	-	-	-	-	-	-	-	-

***p<.001; **p<.01; *p<.05

Table II: Hierarchical regression analysis predicting internet addiction from personality traits, psychological distress, and interpersonal support (n=300)

Predictors		Internet Addiction				P
		B	SE	β	t	
Step I	Constant	3.48	.50	-	6.95	.000
	Extraversion	-.03	.08	-.02	-.34	.738
	Agreeableness	-.27	.08	-.20	-3.33	.001
	Conscientiousness	-.10	.09	-.07	-1.11	.269
	Neuroticism	.21	.6	.17	.85	.005
	Openness	.00	.09	.00	.01	.989
Step II	Constant	3.05	.52	-	5.83	.000
	Extraversion	.02	.08	.01	.23	.816
	Agreeableness	-.23	08	-.17	-2.80	.005
	Conscientiousness	-.6	09	-.05	-.76	.451
	Neuroticism	-.02	.06	-.15	-.33	.008
	Openness	-.03	.09	-.02	-.34	.083
	Psychological Distress	.21	.07	.19	2.83	.005
	Interpersonal Support	.17	.10	-.04	-.69	.006

For step 1: R^2= .096; F (5,294)=3.67, p<003 For step 2: R^2= .089; F (7, 292)=4.06, p<.001

Hierarchical regression analysis: Two regression models were tested to assess predictors of IA (Table II).

In Model 1, personality traits accounted for 10% of the variance in internet addiction (R^2=0.096, p< .003). Agreeableness emerged as a significant negative predictor (β=-0.20, p=.001), while other traits such as extraversion, conscientiousness, and openness were not significant. Neuroticism showed a weak but significant positive association with internet addiction (β=0.17, p= .005). Model 2 incorporated psychological distress and interpersonal support, explaining 18% of the variance (R^2=0.183, p<.001). Psychological distress was a significant positive predictor of internet addiction (β= 0.19, p=.005), while interpersonal support was a significant negative predictor (β= -0.04, p=.006). Notably, agreeableness remained a significant predictor, reinforcing its protective role.

Mediation analysis: Mediation analysis was conducted to examine whether IA mediated the relationship between interpersonal support and psychological distress.

Path c (total effect): showed that interpersonal support significantly predicted lower psychological distress (β=-0.39, t=-5.03, p < .001; 95% BCa CI [-0.55, -0.24]), accounting for 7% of the variance.

In Path a, interpersonal support significantly predicted lower levels of IA (β=-0.25, t=-2.74, p=.006; 95% CI [-0.43, -0.07]).

Path b, revealed that, controlling for interpersonal support, IA positively predicted psychological distress (β= 0.16, t = 3.28, p < .001; 95% CI [0.06, 0.26]).

In Path c', (direct effect), interpersonal support remained a significant negative predictor of psychological distress even after accounting for IA (β = -0.35, t = -4.54, p < .001; 95% CI [-0.51, -0.20]).

The indirect effect was also significant (β=-0.04; 95% BCa CI [-0.08, -0.006]), confirming that IA partially mediates the relationship between interpersonal support and psychological distress.

Gender differences: Table III presents gender-based mean differences across all study variables. Independent sample t-tests revealed that females scored significantly higher than males on neuroticism and openness to change, while males reported significantly higher levels of IA. No significant gender differences were found in psychological distress or interpersonal support. Effect sizes indicated moderate gender

Table III: Gender differences on big five personality traits, interpersonal support, internet addiction, and psychological distress (n=300)

Scales	Male (n=150)		Female (n=150)		t	p	95% CI		Cohen's d
	M	SD	M	SD			L	UL	
Extraversion	3.19	.56	3.11	.64	1.15	.294	-.06	.22	0.13
Agreeableness	3.59	.58	3.80	.54	3.22	.418	-.34	-.08	0.37
Conscientiousness	3.32	.53	3.25	.55	1.24	.473	-.05	-.20	0.14
Neuroticism	2.93	.68	3.34	.81	4.78	-.011	-.58	-.24	0.55
Openness to change	3.45	.57	3.61	.49	2.64	.050	-.28	-.04	0.30
Interpersonal Support	1.80	.45	1.93	.52	2.31	.116	-.24	-.02	0.26
Internet Addiction	2.42	.66	2.09	.84	3.86	.001	.16	.51	0.44
Psychological Distress	2.42	.65	2,56	.72	1.78	.274	-.30	.01	0.20

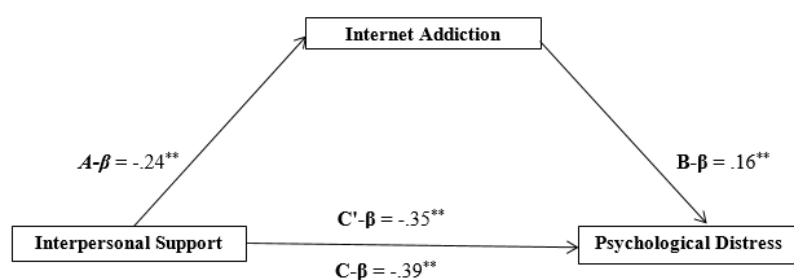Note. CI = Confidence Interval; LL = Lower Limit; UL = Upper Limit; Internet Add = Internet Addiction;

Figure 1: Role of internet addiction as a mediator between interpersonal support and psychological distress

differences in neuroticism (Cohen's d=0.55), IA (Cohen's d=0.44), and openness (Cohen's d=0.30), supporting the hypothesis that males are more prone to IA than females.

DISCUSSION

In this study we primarily tested the associations between personality traits IA and psychological distress through Pearson correlation and hierarchical regression analysis. The findings of other research have shown that the five major personality traits play a significant role in emerging adult addiction to the internet. We found neuroticism as positively related to IA (Table I). This is in line with previous research indicating that people higher on neuroticism are also higher on also risky internet usage.[23] Thus, neurotic individuals appear to experience high levels of distress and interpersonal conflict. They can't cope adequately with the stress and therefore are at a greater risk of developing addictions whilst using internet for example one such research found strong associations between

neuroticism and Instagram addiction.[24] We found non-significant differences between extraversion and IA, as people with extraversion personality trait frequently socialize and form groups and friendships with other people. Furthermore, as extravert individuals engage more in outgoing activities, making friendly simple, happy, sociable, optimistic, enthusiastic, engaging and talkative. In these organized environments they build for themselves they feel less stressed and are less prone to developing IA.[25]

A non-significant relationship of IA to conscientiousness, and openness to experience also exists indicating that adolescents who score high on conscientiousness and are open to experience also give high priority to educational and academic achievements, have strong planning and self-control skills and thus have adequate understanding of the overuse of the Internet. Therefore, they are less inclined to indulge in the world of the internet and suffer from addiction.[24] Past research also suggests that

agreeableness, conscientiousness and self-liking are negatively related to Instagram IA.[22]

Results of the study approved the hypothesis that the significant negative relationship between interpersonal support and IA. This finding is in line with pat research indicating that interpersonal relationships are negatively affected by IA.[26] Nevertheless, current internet functions provide further online connections, in particular some social networks such as Facebook that allow individuals to develop new relationships with acquaintances, as well as maintain close relationships with friends. Hence this takes us to the concerns about whether the internet is harmful to one's interpersonal relationship, or if it might strengthen one's interpersonal relationship, instead. Nonetheless social online networking, browsing porn-websites and watching video contribute to weak interpersonal relationships as a result of higher IA. Thus, results show that adults who are excessively using the Internet had some problems in their daily lives, such as interpersonal problems, behavioral problems, physical problems, psychological problems, and work problems.[27,28] Results from the other studies supported this study findings that social support may increase positive psychological skills and decrease addiction to the Internet. Moreover, on a cognitive level, the self-cognition of college students who have received sufficient social support will be more stable and consistent, making them less motivated to escape from

reality and indulge in the heavy internet usage.[29] Thus, in preventing and recovering from IA the approach of providing positive assistance rather than controlling or scolding adolescents is important.[27] Therefore, improving interpersonal communication skills may prevent addiction to the internet in adolescents.

Our mediation analysis revealed that IA acts as a mediator between interpersonal support and psychological distress. This indicates that, the risk for IA increases individual's vulnerability to experience negative well-being including greater psychological distress and symptoms of depression. Such an addiction in turn results in decreased social support and greater experience of loneliness. Therefore, we suggest clinicians, mental health practitioners and psychiatrists should pay substantial attention to internet usage of young people who are experiencing distress and depression. One of the limitations of the study is that the study focuses on university students, which may not represent the broader population of emerging adults in Pakistan. Interventions designed for these youth at risk of developing addiction and resultant depression should aim in enhancing their self-esteem, greater social approval and support, and overcoming loneliness of at-risk youth.

CONCLUSION

This study highlights the multifaceted nature of IA among emerging adults in Pakistan, demonstrating that personality traits, interpersonal support, and psychological distress significantly contribute to IA risk. Specifically, lower agreeableness and higher psychological distress emerged as key predictors of greater IA, while interpersonal support was inversely associated with both IA and psychological distress. The mediation analysis revealed that IA partially mediates the relationship between interpersonal support and psychological distress, highlighting the indirect impact of social support on mental well-being via problematic internet use. Gender differences further suggest that males are more prone to IA, whereas females report higher levels of neuroticism and openness to change. These findings emphasize the need for preventive interventions that address psychological

vulnerabilities and strengthen interpersonal support systems to mitigate IA, particularly in university populations.

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AUTHORS' CONTRIBUTION

The following authors have made substantial contributions to the manuscript as under:

BH: Conception and study design, acquisition, analysis and interpretation of data, drafting the manuscript, approval of the final version to be published

MW: Acquisition, analysis and interpretation of data, drafting of manuscript, approval of the final version to be published

NI & NE: Acquisition of data, drafting the manuscript, critical review, approval of the final version to be published

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST

Authors declared no conflict of interest, whether financial or otherwise, that could influence the integrity, objectivity, or validity of their research work.

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DATA SHARING STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request

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