CYBER STRAIN: EXPLORING ADVERSE MENTAL HEALTH EFFECTS OF THE PROBLEMATIC INTERNET USAGE AMONG UNIVERSITY STUDENTS

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KEYWORDS	ABSTRACT
	Social Networking Technologies have become an integral part of daily life, particularly among adolescents. However, the positive aspects have been overshadowed by negative ones. The recent studies indicate that university students, mainly during COVID-19, frequently utilize internet technologies excessively, leading to adverse effects on their mental health. Since there is little empirical research on this topic in rural Pakistan, so little is known about it. This study aims to determine association amid problematic internet use and mental health issues among students. Using a cross-sectional design, quantitative data were obtained by using self-administered questionnaire. Population of this study consisted of 367 students from three universities located in the southern in Southern Khyber Pakhtunkhwa Pakistan. The data was analysed inferential statistics. Results revealed a positive link between problematic internet usage and mental health issues, whereas this link was mediated by the meta-cognition and life-events. This was first research of its kind on mental health of the adolescents in southern Khyber Pakhtunkhwa, Pakistan. Its findings represent an important contribution to current body of knowledge. The individual, institutional and policy implications of the results are substantial.
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INTRODUCTION

Modern information and communication technologies, mostly social networking technology, have become essential part of our daily life. Social networking technologies have transformed how we perceive ourselves and connect with the world around us (Vallor, 2020). Social media sites, professional networking sites, chat rooms, blogging, and online gaming are examples of social networking technologies (Garg & Pahuja, 2020). The social networking technologies are immensely appealing, and their use has spread throughout the population, particularly among

adolescents. Adolescents utilize social networking technologies to build their social identities, find work, and learn crucial knowledge through social navigation. An intriguing aspect of social networking technologies is that they can be accessed by electronic devices such as the computers, mobile phones, and tablets, among others, making them available virtually anywhere (Can & Alatas, 2019). Thus, social networking technologies offer various benefits like entertainment, social engagement, business facilitation, skill development, and simplicity of use. However, the beneficial qualities of the social networking technologies are overshadowed by their negative sides.

Recent research studies like those conducted by Nesi (2020), Ghai, Magis-Weinberg, Stoilova, Livingstone and Orben (2022) and Shannon, Bush, Villeneuve, Hellemans and Guimond (2022) have recently expressed worry about the negative mental health implications of inappropriate usage of social networking technologies among adolescents. Adolescents attending university or college are particularly susceptible since they have limitless and ubiquitous access to internet, media devices, and computers on campus. Besides, they are among first generations to have grown up with a wide range of social networking technologies. Young students are expected to utilize such technology for the research and education; nevertheless, excessive usage of social networking technology might expose them to adverse mental health impacts (Alismaiel, Faura, & Al-Rahmi, 2022). Internet and social media usage dramatically increased among students after advent of COVID-19 pandemic (Mengistu, Habtamu, Kassaw, Madoro, Molla, Wudneh & Duko, 2023). The excessive use of online social media can lead to number of mental diseases in university students, like depression, generalized anxiety disorder, social dysfunction, reduced self-esteem & obsessional compulsive disorder among others (Wang, Wang, Yan, Si, Zhan & Tian, 2021).

Other research findings indicated that Social Networking Technology users experience social isolation, racism and sleep disorders (Mushtaque, Khan, Zahra, Fatima, Ejaz, Lak & Raza, 2022). Thus, it is now established that problematic use of social networking technologies has negative mental health consequences on adolescents and is a substantial public health issue in various countries, mainly in Asia and Pakistan (Arif, Qaisar & Kanwal, 2022). Pakistan is a populated country, with more than 50% of population being under the age of 25 (Statista, 2023). A recent report revealed worrisome information. In 2020, there were over 120 million mobile users in Pakistan, with 33% of customers using mobile to access social networking sites. The majority of mobile members were between the ages of 24 and 30, and they spent an average of 40 minutes each day on social networking sites (Asghar, Barbera, Rasool, Seitamaa, & Mohelská, 2023). Adolescents utilize social networking technologies to build their social identities, find work and learn crucial knowledge through social navigation. High usage of computer technologies helped in increasing computer literacy in Pakistan (Khan, Khan, & Anwar, 2023). High problematic internet usage among students in Pakistan after COVID-19 disease has alarming mental health effects.

According to research studies like Mushtaque et al. (2022), Raheeq, Sheikh and Faizan (2021) and Sangtiani, Mehraj and Guriro (2023) the rising use of Social Networking Technologies has resulted in a variety of mental health issues such as the anxiety, depression, social isolation, sleepiness and Facebook addiction among Pakistani students. Despite these well-documented facts, there is currently a scarcity of study in Pakistan on the negative mental health impacts of Social Networking Technologies. And, to the best of my knowledge, no previous research study

on the problematic use of social networking technologies in Pakistan southern region has been done. Thus, this is a significant research gap. Keeping this in mind, the current study's initial research question is "Are university students in the southern Khyber Pakhtunkhwa, Pakistan, suffering from problematic use of social networking sites?" If this is the case, the second study question is "How does the use of social networking sites affect the mental health of students?". Thus, based upon the foregoing introduction, this study is going to focus on the following two objectives:

1. To examine at relationship between problematic internet use & negative mental health effects among university students in southern KP, Pakistan.
2. To investigate the effect of metacognitions and adverse life events in mediating positive link between problematic internet usage and mental health problems among university students in southern KP, Pakistan.

LITERATURE REVIEW

In recent years, incidence of problematic internet use among university students has arisen as a major worry, necessitating extensive research into its possible negative impacts upon mental health (Hayixibayi, 2023). The digital age, defined by global internet access, has undeniably transformed how students interact with academic information and social relationships. Still, the negative influence of this technological innovation on psychological well-being of student population raises the concerns (Sobaih, Hasanein & Abu Elnasr, 2020). Many research studies such as those by Nesi (2020), Ghai, Magis-Weinberg, Stoilova, Livingstone, and Orben (2022), Shannon, Bush, Villeneuve, Hellemans, and Guimond (2022), Mushtaque et al (2022), Raheeq, Sheikh, and Faizan (2021) and Sangtiani, Mehraj, and Guriro (2023), have investigated thus complex link amid problematic internet usage and negative mental health outcomes, shedding light on possible dangers of excessive online interaction. This phenomenon's multidimensional nature includes a wide range of online behaviors, including but not limited to social media use, online gaming and obsessive internet surfing. As students duck themselves in digital domains, impact on their mental health becomes increasingly vital. In Pakistan, surge in internet usage has been notable, with a significant number of university students actively partaking in online activities.

Pakistan's cultural characteristics, along with the fast integration of technology into daily life, provide a unique setting for researching repercussions of problematic internet usage on mental health (Raheeq et al., 2021). In the Khyber Pakhtunkhwa region of Pakistan, the challenges and opportunities presented by internet usage among university students add a unique dimension to the broader discussion. The cultural diversity and distinct socio-economic factors in Khyber Pakhtunkhwa contribute to nuanced understanding of how problematic internet usage effects mental health outcomes. However, since less research has been conducted in this region on this topic, therefore there are rich grounds of research on this topic in KP province of Pakistan. The investigation of problematic internet usage and its impacts on mental health necessitates the use of numerous psychological theories that give frameworks for comprehending complicated interplay between human behavior, technology, and mental well-being. These theories include cognitive behavioral theory (Whealin, Ruzek, & Southwick, 2008), which focuses on identifying and changing maladaptive thought patterns and behaviors; Social Learning Theory (Akers & Jennings, 2015), which emphasizes the role of observational learning and modeling in shaping behaviors.

The psychodynamic theory (Caputo & Tomai, 2020) that delves into unconscious motivations and conflicts that drive behavior; and reward deficiency syndrome (Gondré-Lewis, Bassey, & Blum, 2020), which sees addiction, including internet addiction, as a complex interplay of the genetic, neurobiological, and environmental factors. Based on the above-mentioned theoretical background, and other findings, the research framework of the current study has been made, as seen in the Figure 1. The figure shows that on the left side of the diagram are the dimensions of problematic internet usage, which include tolerance to use net all times, preoccupation due to internet use, and hide use of internet. In the middle of the diagram is the mediating factors, which include the meta cognitions, and adverse life events. Actually, these mediating factors increase the effect of problematic internet usage. In the last part, right side of diagram is the outcome variable of adverse effects of the internet usage. It means that problematic usage of the internet causes the mental health problems including depression, anxiety, and the social dysfunction among the university students. Such mental health problems may ultimately affect the academic and social lives of students; however, this kind of investigation is out of the scope of present study. From the above given framework, the following two hypotheses have been formulated:

H1: The problematic internet usage will be positively associated with mental health problems of the students.
H2: The factors of meta-cognitions and adverse life events will mediate relationship between problematic internet usage and mental health problems of the students.

RESEARCH METHODOLOGY
A cross-sectional research design was used in current study. The cross-sectional research is basically descriptive study that examines data at particular point in time (Cooper & Schindler, 2014).

Population
This is a population-based study (Lieb, 2013) and data was collected online from all those who willingly filled out online questionnaire. The population of students include enrolled students from USTB Bannu, KKKUK Karak, as well as the Kohat University of Science and Technology, Kohat.

Data Collection Procedure & Scales
Data was collected online by sharing the link of online questionnaire in the social media groups and pages of the selected university in the southern region, thus, the scales of the questionnaire include:
   a) The tolerance was measured by two items of social media disorder scale (Eijnden, 2016) and 3-items of facebook addiction scale (Andreassen, Torsheim, Brunborg & Pallesen, 2012).
   b) Preoccupation was measured by 5-items of facebook addiction scale (Andreassen et al., 2012).
   c) The hiding was thus measured by five items of the social media disorder scale (Eijnden, 2016).
   d) Meta-cognition was measured by 5-items of Meta-cognitions Questionnaire (Wells & Hatton, 2005).
   e) Adverse Life Events was measured by five items of Life Events scale (Gray, Litz, Hsu, & Lombardo, 2004).

f) Anxiety, depression and social dysfunction was measured by GHQ-12 scale (Goldberg & Williams, 1988).

Figure 1
Research Framework of Study
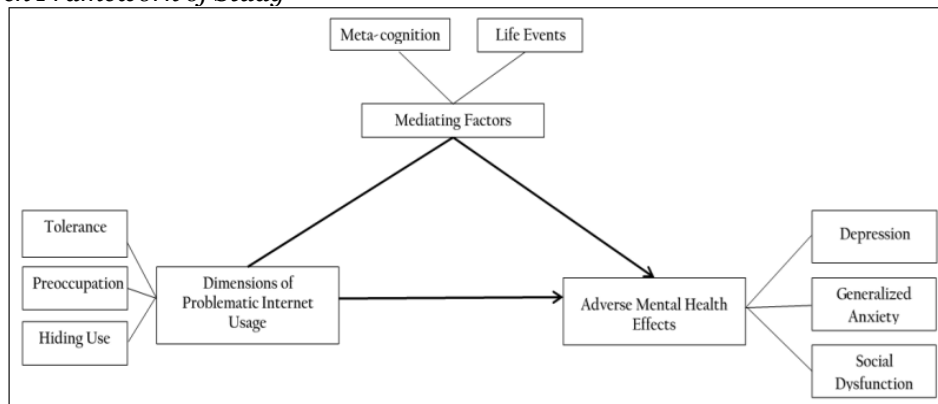
Data Analysis
Data was analyzed by using hierarchical linear multiple regression analysis (Hair, Black, Babin, Anderson, & Tatham, 2016). Whereas mediation analysis was performed by following steps of Barron (Baron & Kenny, 1986). The data was entered into model in two successive steps, in such a way that in first step the relationship between independent and dependent variables was found, while in second step, the mediating role of meta cognitions and adverse life events was examined.

FINDINGS OF STUDY
The findings of study are offered in following order: first, associations amid three independent variables, namely tolerance, preoccupation, hiding usage, and mental health difficulties were investigated. The role of metacognitions and life experiences as mediators was then investigated. Table shows that independent variables of tolerance, preoccupation, hiding usage has brought 14% variation in dependent variable of mental health issues, significant at F= 8.084, p=0.000 level.

Table 1
Regression Model Summary for First Hypothesis

R	R^2	Change Statistics			
		R^2 Change	F-Change	df1	Significance
0.229	0.153	0.143	8.084	03	0.000

Table 2 shows the Standardized Beta Coefficients for the three independent variables. It is clear from table that all three independent variables were significantly and positively associated with dependent variable of mental health problems. First hypothesis, i.e., "The problematic internet usage will be positively associated with mental health problems of the students" is successfully accepted.

Table 2
Regression Analysis results (coefficient) for First Hypothesis

Regression Models		Standardized Beta Coefficients	t-test values	Significance Level
Model 1	Alpha Coefficient	0.391	8.846	0.000
	Tolerance	0.171	1.390	0.065
	Preoccupation	0.197	1.584	0.014
	Hiding Usage	0.124	1.188	0.029

Note: Dependent variable is Mental Health Issues

Table 3 shows results for second hypothesis. Table 3 shows that in first step, the independent variables of tolerance, preoccupation, hiding usage has brought 14% variation in dependent variable of mental health issues, significant at F= 8.084, p=0.000 level. In second step, once mediating variable of metacognitions was added then brought 11% variation in the dependent variable of mental health issues, significant at F= 7.997, p=0.000 level. While in third step, the other mediating variable of adverse life events had brought 08% variation in the dependent variable of mental health issues, significant at F= 5.127, p=0.023 level and thus offered vital information.

Table 3
Regression Model Summary for second Hypothesis

R	R Square	Change Statistics			
		R2 Change	F-Change	df1	Significance
0.229	0.153	0.143	8.084	3	0.000
0.307	0.124	0.112	7.997	2	0.000
0.107	0.094	0.092	5.127	1	0.023

Table 4 shows the Standardized Beta Coefficients for the three independent variables. It is clear from table that all three independent variables were significantly and positively associated with dependent variable of mental health problems. However, when in the second step mediating variable of meta-cognitions was added then the Standardized Beta Coefficients were reduced, but remained significant. In the third step, once the second mediator of adverse life events was added into the model the Standardized Beta Coefficients for the three independent variables were further reduced but remain significant. It means that both mediators have mediated the link between the independent and dependent variables. In this way, the second hypothesis, i.e., "The factors of the meta-cognitions & adverse life events will mediate the relationship between the problematic internet usage and mental health problems of the students" was successfully accepted.

Table 4
Regression Analysis Results (Coefficient) for Second Hypothesis

Regression Models		Standardized Beta Coefficients	t-test values	Significance Level
Model One	(Constant)	0.391	8.846	0.000
	Tolerance	0.171	1.390	0.065
	Preoccupation	0.197	1.584	0.014

	Hiding Usage	0.124	1.188	0.029
Model Two	(Constant)	0.282	7.816	0.001
	Tolerance	0.111	1.211	0.061
	Preoccupation	0.134	1.084	0.013
	Hiding Usage	0.112	1.112	0.021
	Meta-cognition	0.109	1.101	0.041
Model Three	(Constant)	0.122	3.816	0.044
	Tolerance	0.101	1.011	0.077
	Preoccupation	0.104	1.084	0.013
	Hiding Usage	0.100	1.012	0.025
	Adverse Life Event	0.122	1.001	0.045

Note: Dependent variable is Mental Health Issues

DISCUSSION

This study aimed at determining the association between problematic internet use and mental health issues among university students studying in the three selected universities of southern Khyber Pakhtunkhwa province of Pakistan. The results indicated that there was a positive link amid problematic internet use and mental health issues, whereas variables of meta-cognitions & adverse life events have successfully mediated this link. Findings of study are consistent with prior research on the mental health adverse impacts of the problematic internet usage among university students. Prior research were largely undertaken in Western industrialized nations, with only handful in Pakistan. Past research studies, such as those conducted by Asam, Samara and Terry (2019), Arrivillaga, Rey and Extremera, (2020) and Islam et al. (2020) revealed that problematic internet usage resulted in variety of mental health issues like behavioral disorders, depression, thoughts of committing suicide, difficulties sleeping, anxiety, and physical health problems among adolescent students. Similar results were reported by students conducted in Pakistan, for example studies by Bibi, Blackwell and Margraf (2021), Mushtaque et al. (2022) and Unsar et al. (2022) found that problematic internet usage had badly affected the mental health of adolescent in Pakistan. The current study's findings revealed the strong association between problematic internet use and mental health issues in southern Khyber Pakhtunkhwa, Pakistan.

This demonstrates that adolescents who used internet regularly had substantial mental health difficulties. To grasp these connections, we must first know the mechanism of this process. The scientists had discovered that that adolescent suffer from metal health issues after excessively using internet and social media sites since they may suffer from social isolation, and they want to escape from their real life worries (Tateno et al., 2019); they may have self-esteem problems or they may try to compare themselves to other online (Bahrainian, Alizadeh, Raeisoon, Gorji, & Khazaee, 2019); and in some cases adolescents may reduce physical activity and become lazy, sitting all day in front of computers, so leading to mental strain (Khan, Shabbir & Rajput, 2020). In present digital age, our connection to internet has grown intertwined, presenting fabulous opportunities and challenges. The developing technological landscape provides an intriguing tale of how our online habits may seriously interact with vulnerable factor of our psychological well-being. As we traverse this ever-changing terrain, academics and researchers must set out to solve mysteries of human psychology as they try to relate it to technological growths. The tale of internet usage, its mental health consequences has not yet been finished and is continually

going to being written, with each research finding adding something original to our collective knowledge.

CONCLUSION

In conclusion, results of this study show significant association between problematic internet usage and mental health problems among adolescents in the southern Khyber Pakhtunkhwa, Pakistan. The research provided empirical evidence that regular internet usage is linked with significant mental health problems, so suggesting more investigation into underlying processes of this complex link. In this ever-changing digital era, when the internet technologies presents both opportunities and challenges, a combination of disciplines is required for investigating the consequences of internet technologies in terms of their effects upon human mental well-being. We can foster a holistic understanding of how internet use affects mental health by combining insights from the field of psychology, education, computer technology design, and public policy analysis for establishing the path of informed interventions that can empower humans to use the digital landscape with responsibly by maintaining their psychological well-being. In this regard, the collaboration between the scholars, practitioners, and stakeholders will be critical in designing the more resilient and healthy digital future for the next generation as we move forward.

Implications of Study

1. The findings of study may help to raise awareness among learners and teachers about the possible negative effects of excessive internet use on mental health. This awareness can help individuals make educated decisions regarding their internet habits and seek help when necessary.
2. The educators may consider integrating digital literacy and mental health awareness programs into the curriculum to help students to navigate the online world responsibly for desired purposes.
3. The findings of this study indicated the need for the intervention techniques to address problematic internet use among teenagers. Individuals, particularly parents & educators, might benefit from the educational programs and awareness campaigns that assist them understand the potential problems connected with excessive internet usage and apply preventive actions.
4. Administrators and Policymakers may want think about incorporating internet related laws into educational institutions and society. This might include rules encouraging safe internet use, particularly among vulnerable populations such as adolescents.

Future Research Recommendations

1. This was the cross-sectional study, and data were collected at one point time. Future research can be conducted by collecting longitudinal data. Thus, it will help in identifying temporal changes in mental health issues over time.
2. This study only examined mediating variables & did not examine moderating variables. Future study should focus on assessing various moderating variables, such as individual coping mechanisms and personality traits like self-efficacy.
3. This study did not examine the impact sociodemographic and cultural variables. Future studies can investigate how cultural sociodemographic, or factors influence association between internet use and mental health.

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