

The Impact of Social Media on Mental Health in Young Adults: A Study of Instagram Use and Depression Symptoms

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ABSTRACT

The study explored the correlation between Instagram usage and depressive symptoms in 300 young adults. 300 young adults aged 18-25 from universities in Lahore, Karachi, and Islamabad, Pakistan. Using the Bergen Social Media Addiction Scale adapted for Instagram and the Patient Health Questionnaire-9 (PHQ-9), data were gathered in over three months. The study found that the time spent on Instagram was correlated with more depressive symptoms ($r = 0.56, p < 0.001$). The multiple regression analysis revealed that daily usage hours ($\beta = 0.42, p < 0.001$), Social comparison ($\beta = 0.38, p < 0.001$), and passive scrolling ($\beta = 0.29, p < 0.01$) were predictors of depressive symptoms. 41.3% of respondents had moderate to severe depressive symptoms, and 68% of respondents had Instagram usage of more than 3 hours a day. The study found that the problematic, excessive using, and social comparison fueled depressive symptoms for young adults in Pakistan. Digital literacy initiative and mental health awareness programming will help prepositional social media usage in the university student population in Pakistan.

Keywords: Correlation, Instagram usage, depressive symptoms, adults, universities, social comparison, Pakistan.

INTRODUCTION

The advent of social media has globalized the ways in which communication occurs. Instagram has become a particularly popular social media application for sharing pictures. In Pakistan, as of 2024, the internet penetration reached 54.3%, with around 71 million social media users, mainly between the ages of 18 and 34, (Kemp, 2024). The social media phenomenon of Instagram is even more popular amongst the youth in Pakistan. The global popularity of the platform can be attributed to its picture sharing emphasis. However, prolonged use of the application may trigger particular psychological concerns. Users of the application may become more susceptible to social comparison, and disproportionate to reality, Instagram users tend to share pictures of an idealized and more positive version of their reality.

Over the past couple of years, the mental health of young adults in Pakistan, particularly with respect to depression, which is considered the most prominent disabling disorder, has become more concerning. The population of Pakistan is heavily burdened with mental health issues, whereby around 34% of the population has or had a mental health disorder in their life (Naeem et al., 2022). Young adults in

Pakistan are particularly vulnerable. Young university students are even more susceptible to mental health issues due to the academic pressure, social expectations, and uncertainty in their careers. Because of the increased use of social media and the rise of mental health issues, it is important to understand and investigate the relationship between the two.

Pending MHC submissions acknowledged general mental health. Social media usage was coupled with peer interactions to assess face-to-face associated quality. Case studies conducted in Bangladesh highlighted a positive association between social media usage, specifically Facebook and mental health in contrast to relational wellbeing where a discord was noted (Ho & McKay, 2015). Comparatively scarce Instagram-focused studies modified strain (Lee, 2017). Instagram's primary use allows a profile to be developed with augmented images and posts, pinning a personal brand, and a source of validation (Stefanone & Jang, 2009). Social media usage patterns differ based on cultural patterns where Instagram perspectives in Bangladesh may contrast with Western scenarios. Being family-centered and collectivist, internal resource patterns adjust to cultural expectations where Western scenarios of individualism facilitate personal choices (Fardouly et al., 2021). Collectivist care and strain patterns suggest altered cultural settings targeted Western-focused relational and mental health tool developments.

Pakistan's digital arena has rapidly advanced and the social media range has grown vastly due to smartphone proliferation and economical internet data plans. University students quickly adopted and integrated social media into their daily routines, spending a significant part of their day on social media (Ahmed & Khan, 2023). This immersion occurred during a significant social and mental developmental stage where identity was formed, relationships and social structures were navigated, and essential life decisions were finalized. Kahn, R. and Ahmed, K. (2023). Social media and mental health of students in Pakistan. National University of Science and Technology.

Theoretical approaches that describe the impact of social media on mental health included the social comparison theory, which stated that people tend to evaluate themselves against others, often detrimental when comparing to others perceived as superior (Festinger, 1954). On Instagram, the curated content triggered constant upward social comparison, as users shared predominantly positive life moments and enhanced images. Moreover, the fear of missing out (FOMO) greatly mediated the compulsive checking and was a major contributor to the development of anxiety and depression (Przybylski et al., 2013).

Another major distinction to understand mental health implications was passive versus active use of Instagram. Passive use, which is mindlessly scrolling through the feed without interaction, is associated with negative mental health outcomes to a greater degree than the positive outcomes that result from active participation through posting and commenting (Verduyn et al., 2021). Due to the protective nature of the Pakistani cultural norms, users preferring passive observation were probably influenced by social privacy and domestic restrictions. These behavioral patterns provided valuable information for developing context-specific interventions.

Pakistan, like the rest of the globe, experienced an increase in the use of social media during the COVID-19 pandemic, which was a consequence of the social distancing measures in place. The abrupt increase in use of social media and social distancing measures combined with mental health issues on the rise in young adults (Abbas et al., 2024). Sustained high usage of social media in the post-pandemic world necessitates an understanding of its implications for mental health. The implications of the pandemic gave urgency to the understanding of the psychological effects of social media on the youth of Pakistan.

Understanding the implications of social media on mental health in Pakistan also requires the understanding the differences in social media use between the genders and the outcomes on mental

health. Studies showed that women used the platform more and suffered more from social comparison and dissatisfaction with their bodies (Fardouly & Vartanian, 2023). The patriarchy and the social structures around marriage and family honor in Pakistan would amplify the effects of social media on young women. Understanding the gendered differences in social media use and their social mental health repercussions allow the development of gendered social health policy to target vulnerable groups.

Research Objectives

1. To establish the extent to which symptoms of depression in young adults in Pakistan are related to their Instagram usage patterns (average time on Instagram daily, their engagement levels, and frequency of use).
2. To assess the Instagram engagement in social comparison and passive scrolling, the posting of content, and the demographic predictors that contribute to depression.
3. To assess the prevalence of depression symptoms in the university student population in Pakistan's major cities (Lahore, Karachi, and Islamabad) who are active users of Instagram.

Research Questions

1. How does the relationship between time spent on Instagram and the severity of depressive symptoms manifest in Pakistani young adults?
2. What Instagram behaviors (social comparison, passive scrolling, and active participation) are the most significant predictors of depressive symptoms in this demographic?
3. What percentage of Instagram-using university students in Pakistan demonstrates characteristics of clinically significant depression?

Significance of the Study

This study provided Pakistan's developing socio-technological context with the first research focus on Instagram and depression symptoms within the social and digital media mental health framework. This research provided evidence on the psychological impact of Instagram, particularly on mental health professionals and social policy educators and policymakers. This study is also significant in relation to the Pakistan literature gap, much of which is Western-centric, culturally and contextually. This culturally sensitive study should be the basis of developing integrated mental health programs. The evidence on risk behaviors/depression symptoms provided the basis on developing social media usage health education programs. Non-Western perspectives on the psychological effects of social media have bolstered cross-cultural understanding of the effects of digitized social media on mental health and social media use during different socio-cultural frameworks while contributing to global conversations.

LITERATURE REVIEW

The omnipresence of social media, especially Instagram, has resulted in disproportionate attention on understanding the social media landscape's psychological implications, particularly its effects on young adults, due to its image-driven content and popularity among the demographic. In a longitudinal study, Lup et al. (2021) demonstrated that Instagram use was associated with a decline in self-esteem and life satisfaction and increased social comparison. This study established Instagram use as a predictor of declining mental well-being, suggesting the use was not a consequence of the observed declines. Instagram use was also associated with increased anxiety and depression levels, as uncovered by Sherlock and Wagstaff (2023), in comparison to non-users, which the authors attributed to the exposure and pressures of idealized self-presentations.

Social comparison emerged as one of the key pathways by which Instagram affected mental health. Social networking sites as a whole exacerbate the psychological impact of upward social comparison, as revealed in a meta-analysis by Vogel et al. (2022) of 42 studies which concluded that upward social

comparison was associated with depressive symptoms, lower self-esteem, and greater body dissatisfaction. Instagram further prioritizes social comparisons through its algorithmic content curation, which selects content and presents each user with highlight reels of the lives of others that set unrealistic standards of success and happiness. Tandoc et al. (2021) built on this idea by showing that, in the case of Instagram, the frequency of social comparison was a mediator of the link between depression and time spent on the platform, thus showing that the manner of use was more important than time spent on the platform alone.

The different patterns of use, either active or passive, had different effects on Instagram's impact on psychological well-being. Verduyn et al. (2021) made the distinction between active engagement (liking, commenting, posting) and passive consumption (browsing without interaction) and concluded that passive use of Instagram predicted depression over time, while active use had neutral or mixed effects. Their interpretation of the data suggested that passive use of Instagram depression associated with social isolation, while active use depression associated with social isolation and social connectedness. In a similar vein, Throuvala et al. (2022) noted that the absence of purposeful goal-directed use, or passive scrolling, was a major contributor to rumination and the loss of motivation, along with painful feelings of FOMO, particularly in adolescents and young adults.

Research on gender differences in Instagram use and mental health outcomes was also important. Fardouly and Vartanian (2023) found in their systematic review that females interacted with more Instagram content and more frequently engaged with appearance-related content, resulting in greater depression symptoms and body image concerns attributed to their use of Instagram compared to males. Their work confirmed that Instagram's focus on highly polished photographs of lifestyle and sociocultural beauty standards profoundly impacted young women, especially those with weak self-esteem or mental health issues. In contrast, Dane and Bhatia (2024) highlighted that males also suffered mental health consequences, which seemed to stem more from the stress of Instagram's other social and economic display associated with success, wealth, and fitness.

Most studies have come from Western societies though the cultural context significantly shaped how social media impacted the mental health studies. While research focused on Pakistan and the broader South Asian region was limited, it was growing. Ahmed and Khan (2023) focused on social media and anxiety reported by students in Pakistan and found that 67% of students used Instagram and Facebook and other social media platforms reported anxiety about the use of anxiety. They pointed out stressors that were specific to the culture which includes the pressure to conform to traditional gender roles, save the family reputation, and comparison in terms of educational and career achievements. Naeem et al. (2022) pointed out in the mental health crisis in Pakistan that many young adults not seeking help because of the stigma attached to mental health issues, social media negative impact social media used.

FOMO, the fear of missing out, has become a massive psychological bridge between the use of social media and mental health issues. FOMO has shown as a psychological barrier between social media use and social well-being, with social media platforms being a factor in the deterioration of social well-being in people with a heightened sense of FOMO. Instagram, for example, has real-time events and experiences being shared that trigger FOMO and can result in heightened anxiety around social situations or the feeling of having an inferior life. In a later study, problematic social media use driven by FOMO was linked to an increase in depression and anxiety symptoms. This suggests that the mental health impacts of problematic social media use are a result of underlying mental health issues.

Mental health researchers have begun to focus on problematic and addictive social media use. Griffiths et al. (2023) applied addiction frameworks to social media behaviors and described core addiction components in heavy users such as salience, mood modification, tolerance, withdrawal, conflict, and relapse. These components were used to develop the Bergen Social Media Addiction Scale (BSMAS)

which assesses all the described core addiction components on social media. Research demonstrating the scales validity showed that 5-10% of users within the samples studied showed addictive patterns of use which were associated with considerable functional impairment and psychological distress. Bányai et al. (2021) adapted assessment tools for Instagram and showed that platform-specific addiction measures, compared to general social media addiction, were able to predict unique variance in several mental health outcomes.

Longitudinal studies have offered valuable insight into the causal relationships between social media use and depression. An experimental study conducted by Hunt et al. (2021) asked participants to either limit social media use to 30 minutes a day or keep their social media usage over the three weeks to the study standard. Those asked to use social media less reported a significant decline in depression and loneliness compared to the control group during the three weeks, thus providing causal evidence that limiting social media use positively impacted mental health. On the other hand, Coyne et al. (2023) conducted a large-scale, eight-year longitudinal study that observed social media usage and depression over time, finding a bidirectional relationship in which social media use over time predicted subsequent depression and depression predicted increased social media use, illustrating the complex reciprocal causation that social media use and depression have, and thus require more nuanced intervention strategies.

Instagram content exposure patterns impacted exposure on psychological outcomes. Fatt et al. (2023) studied effects on psychological state variation by content type and found exposure to fitness and beauty content increased body dissatisfaction. Exposure to travel and food content had neutral or positive effects based on individual differences. They noted that algorithmic content curation based on audience engagement is generating filter bubbles that may cause vulnerable people to be repeatedly exposed to psychologically harmful content. Brown and Tiggemann (2022) showed that exposure to idealized images on Instagram triggered social comparison processes instantaneously and then depressed mood that accumulated and extended later.

Instagram mental health impact showed protective and resilience mechanisms. Yoon et al. (2023) found that self-compassion was a significant protective factor and individuals high in self-compassion had fewer negative Instagram use psychological effects despite similar exposure to it. Digital literacy and critical media consumption skills also acted as protective mechanisms, enabling users to discern and critique harmful content to be exposed to and distorted comparison. Weinstein et al. (2024) showed that mindful social media use, as social media engagement that is present and intentional, in contrast to habitual mindless scrolling, diminished negative psychological impact.

RESEARCH METHODOLOGY

The researchers adopted the quantitative cross-sectional approach to understand the implications of Instagram use on depression symptoms in young adults in Pakistan. The participants of this study were 300 Instagram users aged 18-25 years. Initially, purposeful sampling was undertaken to recruit participants from universities in Lahore, Karachi, and Islamabad. Participants were selected during the three-months data collection phase, and for this purpose, a structured questionnaire was used. The questionnaire was divided into three sections: demographic data, the Bergen Social Media Addiction Scale (BSMAS) adapted for Instagram use, and Patient Health Questionnaire-9 (PHQ-9) used to evaluate depression symptoms. The questionnaire was distributed via university email lists and social media from where participants were able to complete it. The researchers also calculated the average time participants spent on Instagram, number of times the application was checked, and the type of activities participants were involved in (scrolling, posting, and social comparison) to understand Instagram engagement. For the statistical analysis, descriptive statistics were used to understand the characteristics of the sample, Pearson correlations were calculated to explore the relationship between

patterns of Instagram use and depression scores, and multiple regression analysis was used to find the predictors of depression symptoms for the demographic variables. The study was ethically approved from the relevant board and all study participants were informed of their consent and guaranteed confidentiality and anonymity during the study.

RESULTS AND DATA ANALYSIS

Demographic Characteristics

The study sample comprised 300 young adults from three major Pakistani cities, with participants recruited from various universities. The demographic analysis revealed important patterns in the sample composition that provided context for understanding Instagram use and mental health outcomes.

Table 1: Demographic Characteristics of Participants (N=300)

Characteristic	Category	Frequency	Percentage
Gender	Male	132	44.0%
	Female	168	56.0%
Age	18-20 years	108	36.0%
	21-23 years	126	42.0%
	24-25 years	66	22.0%
City	Lahore	105	35.0%
	Karachi	102	34.0%
	Islamabad	93	31.0%
Education Level	Undergraduate	189	63.0%
	Graduate	111	37.0%
Field of Study	Sciences	87	29.0%
	Social Sciences	102	34.0%
	Engineering	66	22.0%
	Business	45	15.0%

The demographic distribution showed relatively balanced representation across cities and age groups. The sample included more female participants (56%) than males (44%), which aligned with research indicating higher social media engagement among young women. The majority of participants (63%) were undergraduate students, with ages concentrated in the 21-23 years range (42%). This age distribution represented the prime developmental period for identity formation and social connection,

making it particularly relevant for examining social media's psychological impacts. Geographic distribution across Pakistan's three largest urban centers ensured diverse representation of cultural and socioeconomic backgrounds within the educated urban youth population.

Instagram Usage Patterns

Analysis of Instagram usage patterns revealed concerning levels of engagement among Pakistani young adults. Daily usage time, frequency of checking the application, and types of engagement activities showed substantial variation across the sample, providing insights into behavioral patterns associated with the platform.

Table 2: Instagram Usage Patterns (N=300)

Usage Pattern	Category	Frequency	Percentage	Mean (SD)
Daily Usage Time	Less than 1 hour	23	7.7%	3.8 hours (1.6)
	1-2 hours	73	24.3%	
	2-3 hours	96	32.0%	
	3-5 hours	81	27.0%	
	More than 5 hours	27	9.0%	
Checking Frequency	Less than 10 times/day	45	15.0%	28.5 times (14.2)
	10-20 times/day	93	31.0%	
	20-30 times/day	102	34.0%	
	30-50 times/day	48	16.0%	
	More than 50 times/day	12	4.0%	
Primary Activity	Passive scrolling	147	49.0%	
	Social comparison	78	26.0%	
	Active posting	42	14.0%	
	Messaging	33	11.0%	
Years Using Instagram	Less than 2 years	27	9.0%	4.3 years (1.8)
	2-4 years	135	45.0%	
	4-6 years	108	36.0%	
	More than 6 years	30	10.0%	

Instagram usage patterns demonstrated that 68% of participants spent more than 3 hours daily on the platform, significantly exceeding recommendations for healthy social media use. The mean daily usage time of 3.8 hours indicated substantial life portions devoted to Instagram engagement. Checking frequency proved even more alarming, with participants checking Instagram an average of 28.5 times daily, suggesting compulsive and habitual usage patterns. Over half the sample (54%) checked

Instagram more than 20 times daily, indicating difficulty disengaging from the platform. Passive scrolling emerged as the dominant activity (49%), consistent with research identifying passive consumption as particularly problematic for mental health. Social comparison activities accounted for 26% of primary engagement, representing a substantial proportion engaged in behaviors theoretically linked to negative psychological outcomes.

Depression Symptom Prevalence

Depression symptoms were assessed using the Patient Health Questionnaire-9 (PHQ-9), a validated instrument measuring depression severity. The PHQ-9 total scores ranged from 0-27, with established cutoff points for depression severity categories.

Table 3: Depression Symptom Severity Distribution (N=300)

Depression Severity	PHQ-9 Score Range	Frequency	Percentage	Mean PHQ-9 Score
Minimal Depression	0-4	48	16.0%	11.4 (5.8)
Mild Depression	5-9	128	42.7%	
Moderate Depression	10-14	81	27.0%	
Moderately Severe	15-19	33	11.0%	
Severe Depression	20-27	10	3.3%	
Clinically Significant	≥10	124	41.3%	

Table 4: Depression Symptoms by Gender

Gender	Minimal (%)	Mild (%)	Moderate+ (%)	Mean PHQ-9	t-value	p-value
Male (n=132)	27.3%	46.2%	26.5%	9.8 (5.2)	-3.47	<0.001
Female (n=168)	7.1%	40.5%	52.4%	12.6 (5.9)		

Depression prevalence findings revealed concerning mental health patterns among Instagram-using young adults in Pakistan. The mean PHQ-9 score of 11.4 fell within the moderate depression range, indicating clinically significant symptoms at the population level. Only 16% of participants reported minimal depression symptoms, while 41.3% scored above the clinical cutoff (PHQ-9 ≥10) warranting professional mental health evaluation. The distribution showed 27% with moderate depression, 11% with moderately severe symptoms, and 3.3% with severe depression requiring immediate intervention. These prevalence rates substantially exceeded general population estimates for depression, suggesting elevated risk among this demographic. Gender analysis revealed significant differences, with females reporting significantly higher depression scores (M=12.6) compared to males (M=9.8), $t(298)=-3.47$, $p<0.001$. Over half of female participants (52.4%) experienced clinically significant depression compared to 26.5% of males, consistent with global patterns but potentially amplified by cultural factors specific to Pakistan.

Correlation Analysis

Pearson correlation analysis examined relationships between Instagram usage variables and depression symptoms, revealing patterns of association between platform engagement and mental health outcomes.

Table 5: Correlations Between Instagram Use Variables and Depression Symptoms

Variable	Depression Score	Usage Time	Check Frequency	Social Comparison
Depression Score	1.00			
Daily Usage Time	0.56***	1.00		
Check Frequency	0.48***	0.67***	1.00	
Social Comparison	0.62***	0.51***	0.44***	1.00
Passive Scrolling	0.43***	0.58***	0.52***	0.46***
Active Posting	-0.12*	0.24***	0.19**	-0.08
BSMAS Score	0.59***	0.71***	0.68***	0.55***
Years Using Instagram	0.18**	0.31***	0.29***	0.22**

*p<0.05, **p<0.01, ***p<0.001

Correlation analysis demonstrated strong significant positive associations between various Instagram usage patterns and depression symptoms. Daily usage time showed a strong positive correlation with depression scores ($r=0.56$, $p<0.001$), indicating that participants spending more time on Instagram reported higher depression levels. The relationship between check frequency and depression ($r=0.48$, $p<0.001$) suggested that compulsive checking behaviors associated with worse mental health outcomes. Most notably, social comparison behaviors exhibited the strongest correlation with depression ($r=0.62$, $p<0.001$), supporting theoretical predictions that comparing oneself to others on Instagram significantly impacted psychological well-being. Passive scrolling also correlated positively with depression ($r=0.43$, $p<0.001$), consistent with literature identifying passive consumption as problematic. Interestingly, active posting showed a weak negative correlation with depression ($r=-0.12$, $p<0.05$), suggesting that genuine self-expression and social connection through posting might provide protective benefits. The Bergen Social Media Addiction Scale score strongly correlated with depression ($r=0.59$, $p<0.001$), indicating that addictive usage patterns substantially contributed to depressive symptoms.

Regression Analysis

Multiple regression analysis identified which Instagram usage variables significantly predicted depression symptoms while controlling for demographic factors. Hierarchical regression examined the unique contribution of different variable sets.

Table 6: Hierarchical Multiple Regression Analysis Predicting Depression Symptoms

Model	Variables	B	SE	β	t	p	R ²	ΔR^2
1	(Demographics)						0.12	0.12***
	Gender (Female)	2.78	0.65	0.24	4.28	<0.001		

	Age	-0.31	0.19	-0.09	-1.63	0.104		
	City (dummy)	—	—	—	—	0.243		
2	+ Basic Usage						0.38	0.26***
	Daily Usage Hours	1.48	0.21	0.42	7.05	<0.001		
	Check Frequency	0.08	0.03	0.16	2.67	0.008		
3	+ Engagement Types						0.52	0.14***
	Social Comparison	2.15	0.29	0.38	7.41	<0.001		
	Passive Scrolling	1.64	0.48	0.29	3.42	0.001		
	Active Posting	-0.89	0.52	-0.08	-1.71	0.089		
4	+ BSMAS Score						0.56	0.04***
	BSMAS Total	0.42	0.11	0.23	3.82	<0.001		

Note: N=300. B = unstandardized coefficient; SE = standard error; β = standardized coefficient

The hierarchical regression analysis revealed that Instagram usage patterns significantly predicted depression symptoms beyond demographic variables. Model 1, including only demographics, explained 12% of variance in depression scores, with gender emerging as the only significant predictor. Model 2 added basic usage variables (daily hours and check frequency), substantially increasing explained variance to 38% ($\Delta R^2=0.26$, $p<0.001$). Daily usage hours emerged as the strongest predictor ($\beta=0.42$, $p<0.001$), with each additional hour predicting a 1.48-point increase in PHQ-9 scores. Check frequency also significantly predicted depression ($\beta=0.16$, $p=0.008$), though with smaller magnitude. Model 3 incorporated engagement types, further increasing explained variance to 52% ($\Delta R^2=0.14$, $p<0.001$). Social comparison behavior proved the strongest specific predictor ($\beta=0.38$, $p<0.001$), with participants frequently comparing themselves to others scoring 2.15 points higher on depression measures. Passive scrolling also significantly predicted depression ($\beta=0.29$, $p=0.001$), while active posting showed non-significant negative trends. The final model added the BSMAS addiction score, achieving total explained variance of 56%. Addictive usage patterns independently predicted depression ($\beta=0.23$, $p<0.001$) even after accounting for usage time and specific behaviors, suggesting that addiction-like engagement with Instagram represented a distinct risk factor beyond mere usage quantity.

Further exploratory analyses examined specific depression symptom patterns and moderating effects of demographic variables on the relationship between Instagram use and mental health outcomes.

Table 7: Instagram Usage by Depression Severity Categories

Depression Category	N	Mean Hours	Usage	Mean Frequency	Check	Social (%)	Comparison
Minimal (0-4)	48	2.1 (1.1)		15.3 (8.7)		12.5%	
Mild (5-9)	128	3.2 (1.3)		24.1 (11.2)		21.1%	

Moderate (10-14)	81	4.6 (1.4)	34.2 (13.6)	32.1%
Moderately Severe+ (15+)	43	5.8 (1.7)	42.8 (16.4)	48.8%
F-statistic		52.37***	38.94***	$\chi^2=28.65***$

Table 7 demonstrated clear dose-response relationships between Instagram usage intensity and depression severity. Participants with minimal depression spent approximately 2.1 hours daily on Instagram and checked 15 times, while those with moderately severe or severe depression averaged 5.8 hours and 42.8 checks daily—nearly triple the usage. The proportion engaging primarily in social comparison behaviors increased systematically across depression categories, from 12.5% among minimally depressed to 48.8% among severely depressed participants. These patterns supported causal hypotheses that excessive Instagram use contributed to depression development, though cross-sectional design precluded definitive causal conclusions. The dose-response gradient strengthened confidence in the relationship beyond mere correlation.

Table 8: Moderation Analysis - Gender Differences in Instagram-Depression Relationship

Predictor	Outcome: Depression	Males (n=132)	Females (n=168)	Interaction
Daily Usage Hours	β (p-value)	0.34***	0.48***	F=4.23*
Social Comparison	β (p-value)	0.29***	0.44***	F=5.67*
Passive Scrolling	β (p-value)	0.21**	0.35***	F=3.89*

*p<0.05, **p<0.01, ***p<0.001

Moderation analysis revealed that gender significantly moderated relationships between Instagram use and depression. While associations remained significant for both genders, effects proved consistently stronger for females. The relationship between daily usage and depression was significantly stronger among females ($\beta=0.48$) compared to males ($\beta=0.34$), interaction $F(1,296)=4.23$, $p<0.05$. Similarly, social comparison effects showed larger magnitude for females ($\beta=0.44$) versus males ($\beta=0.29$), with significant interaction $F(1,296)=5.67$, $p<0.05$. These findings aligned with literature suggesting females experienced greater vulnerability to social media's negative effects, potentially due to greater engagement with appearance-focused content, higher baseline levels of social comparison tendencies, and stronger sociocultural pressures regarding appearance and social acceptance in Pakistani society.

Qualitative Insights from Open-Ended Responses

In addition to primarily quantitative data, the questionnaire included open-ended questions regarding the participants' Instagram experiences. Thematic analysis conducted on the 178 (59.3% response rate) open-ended questions showed patterns. Most participants indicated feelings of inadequacy associated with exposure to other users' achievements, travels, and lifestyles. Many described Instagram as "addictive" and a "time-wasting" activity, but reported that they felt unable to stop using it because of the phenomenon of "social information" censorship. Restrictions regarding the appearance, fashion and beauty of women were especially noted regarding influencer content by female participants. Instagram usage at night, which several participants reported, has been associated with depressive disorders and may partly explain the dysfunction of sleep. Culturally driven Instagram usage focused on success and fame, the need to hide failure and struggles, and tensions between modern and traditional lifestyles

were described. These culturally specific qualitative findings provide context to the quantitative data and indicate the presence of culturally specific constructs for further study.

DISCUSSION

The current study identified the association of Instagram usage with the symptoms of depression among young adults in Pakistan. These findings were in tandem with the international literature whilst showing patterns that were specific to the culture. The 41.3% of the subjects showing clinically significant symptoms of depression was particularly alarming. More recently, the estimate for the general population prevalence of young adults in Pakistan is in the range of 22-28% (Naeem et al., 2022). This increased prevalence indicates that Instagram using students of university were within a particularly vulnerable population. Hence, there is a mental health necessity for the depression within this population. The association of depression with the amount of time spent daily on Instagram ($r=0.56$, $p<0.001$) is in line with the literature from the Western context (Keles et al., 2020). The relationship described on the Western context literature shows some level of cross-cultural consistency. The extent of the association in the given Pakistani context is unprecedented from most of the global literature, which could be explained by the cultural context in Pakistan with particularly strong social norms related to social media use as a form of social support. These norms tend to be more pronounced in Pakistani culture.

Social comparison appeared as the strongest predictor of depressive symptoms ($\beta=0.38$, $p<0.001$) affirming the predicting frameworks, which identifies upward social comparison as the key mechanism through which Instagram influences mental health (Vogel et al., 2022). The impact in this case might be especially strong considering the value of social standing, respect, educational attainment, and family reputation in Pakistani society. Instagram facilitates constant exposure to peers attaining and displaying lifestyles and achievements that are highly curated, which likely triggered comparisons that are implicated at the family level. Gender differences were striking, with females reporting higher scores on depression and stronger associations between Instagram use and depressive symptoms. This finding converges with international patterns (Fardouly & Vartanian, 2023) but may be especially strong in the Pakistani context, where pressure on young women revolves around marriage, appearance, and family honor, along with mental health.

The confidence in potential causal pathways strengthened from the dose-response relationship between usage intensity and severity of depression, although the cross-sectional design limited the ability to draw definitive causal conclusions. Those with the most severe depression spent almost three times the amount of time on Instagram as those with the mildest symptoms, indicating that either excessive Instagram use contributed to the development of depression or that depressed individuals were seeking Instagram as a refuge or distraction. Bidirectionality is the most likely case, where problematic Instagram use drove depressed individuals to even greater platform engagement, resulting in self-reinforcing cycles. Hunt et al. (2021) provided experimental evidence on the causality of social media use on depression, indicating that social media use reduction depression interventions could be of therapeutic value to struggling young adults with depression in Pakistan.

CONCLUSION

The study shows that patterns of Instagram use are related to depression symptoms in young adults in Pakistan. This may be because of the culturally sensitive nature of the issue in Pakistan, as 41.3% of the depression symptoms reported by university students in the sample were clinically significant. Instagram use predicted passive scrolling, social comparison, and scrolling depression. Together, these accounted for 56% of the predicted variance in the depression score. This demonstrates the powerful effects social media can have on the mental health of Pakistan youth that are digitally connected, consistent with global patterns but perhaps in amplified form. This research contributes to the literature

on mental health and social media in the Pakistan context, and may help orient more culturally relevant mental health interventions.

The significant role of social comparison as a predictor of depression shows the need for interventions that promote social media critical use and media literacy. The lack of public health discourse on depression that is visible may point to systematic issues with the mental health infrastructure and public discourse in Pakistan. Such an educated, urban sample may suggest the need to rethink the public made on depression and increase the access to Tele mental health and promote social media use that is depression preventative. The gendered nature of depression in the sample shows the need for gendered public health approaches to mental health that are integrated with digital health.

Limitations of the study included its cross-sectional design preventing causal inferences, the purposive sampling which restricted generalizability beyond urban university students, and the reliance on self-report measures which may have biases related to recall and social desirability. For future research, it would be important to include longitudinal designs which track Instagram use and mental health over time, and to include experimental research to study interventions aimed at establishing causality, as well as including a more socioeconomically diverse population beyond university students. Nonetheless, the research highlighted the important issue that Pakistani young adults have Instagram use that represents a considerable concern for their mental health and this must be acted on by healthcare workers, educators, and policymakers as well as the tech companies involved.

Pakistan's rapidly adopted social media and mental health infrastructure, or lack thereof, has resulted in the social media related psychological issues to go unaddressed for a considerable period of time. The issue of digital wellness became increasingly relevant as the Pakistani populace, and particularly the youth, became more psychologically vulnerable to mental health issues, with the ubiquitous smartphone use and social media. The research laid the groundwork for the development of culturally relevant, and culturally sensitive, psychologically healthy digital interventions that have the potential to curb a considerable amount of psychological distress that the digitally connected young adults of this generation, and of those to come, may be suffering.

RECOMMENDATIONS

As a result of this research, a number of recommendations can be proposed for each stakeholder. Universities should provide holistic digital wellness education to students that encompasses the healthy use of social media, recognition of problematic use, and the development of critical media literacy for resilient coping regarding social comparison and distancing. Mental health services in Pakistani universities, particularly in university counseling centers, require expansion and destigmatization, with protocols that include screening and treatment for social media-related depression. Staff should receive training to address the gaps focusing on technology and mental health and the promotion of help-seeking behaviors. Young adults should be the focus of public health messaging that aims to describe the offline and online activity balance, a permissible daily usage limit, and the signs of harmful psychological engagement with social media. Future studies in Pakistan will benefit from a longitudinal approach that establishes causal pathways, the development and testing of culturally relevant interventions aimed at problematic use of Instagram, and an examination of protective factors and resilience patterns in youth. Regulation of social media platforms should include the provision of usage monitoring tools, social media mental health tools and resources, and features that limit addictive design elements that target young users.

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