

The Mediating Role of Maladaptive Perfectionism in the Association Between Problematic Instagram Use and Suicidal Ideation Among Medical Students

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Abstract

Objective

Medical students face constant pressure to meet high academic standards, making them vulnerable to perfectionistic concerns and mental health disturbances. Problematic social media use, particularly Instagram, may exacerbate these vulnerabilities. This study examines whether maladaptive perfectionism mediates the relationship between problematic Instagram use and suicidal ideation in medical students.

Methods

This descriptive-correlational study used structural equation modeling (SEM). The sample included 362 medical students from Hamadan University of Medical Sciences (2024–2025 academic year), selected via convenience sampling. Participants completed standardized measures of problematic Instagram use, maladaptive perfectionism (Tehran Multidimensional Perfectionism Scale), and suicidal ideation (Beck Scale for Suicidal Ideation). Due to non-normal multivariate distributions, bootstrap resampling (5,000 resamples) with 95% confidence intervals was employed.

Results

The final model showed excellent fit ($\chi^2/df = 0.927$, CFI = 0.999, RMSEA = 0.0001). Problematic Instagram use had a significant direct effect on suicidal ideation ($\beta = -0.15$, $p = 0.018$). Maladaptive perfectionism also had a strong positive direct effect ($\beta = 0.75$, $p < 0.001$). The indirect effect of problematic Instagram use on suicidal ideation through maladaptive perfectionism was significant ($\beta = 0.09$, $p = 0.012$, 95% CI [0.007, 0.149]), indicating partial mediation.

Conclusion

Maladaptive perfectionism partially mediates the relationship between problematic Instagram use and suicidal ideation. Problematic Instagram use not only directly predicts higher levels of suicidal ideation but also exerts an indirect effect through increased maladaptive perfectionistic tendencies. These findings underscore the importance of designing interventions that simultaneously target both maladaptive perfectionism and problematic social media use among medical students.

Introduction

Today, the existence of the information explosion era is evident to all (1). At the end of the 20th century, due to enormous scientific-technological transformations, the world underwent significant changes that influenced all areas of human life, including political, economic, and social issues (2). Under the

influence of these developments, the world took on a new form, and with the emergence of novel communication networks and the impact of this technological revolution on all dimensions of human life, a new society emerged, termed by some scholars as the information society (3). These modern technologies and innovations have created a profound transformation in the realm of communication and knowledge transfer. In the current era, individuals can access required information from various sources in the shortest possible time through internet access (4). With the expansion of diverse social networks, the manner in which individuals use these media as part of digital resources has gained particular importance. Social networks, as powerful tools for information transmission worldwide, have enabled people to benefit directly from the latest sciences and technologies in various fields and influence people's lives in different ways, with Instagram being one of the most significant of these networks (5).

Instagram, launched in October 2010, has become one of the most prominent social media platforms globally by offering a wide range of features, including Stories, Live streaming, Reels, and advanced content editing tools. As of 2025, the platform has approximately 3 billion monthly active users worldwide. In Iran, despite internet restrictions and the blocking of several international platforms, Instagram remains one of the most widely used social media applications. Recent data indicate that Iran had approximately 48 million social media user identities in late 2025, equivalent to 51.8% of the total population. Instagram continues to rank as a leading platform in the country, particularly among young adults. (6). Anxiety, depression, low self-esteem, and loneliness are among the most common reported consequences associated with problematic use of social networks, which requires further investigation (7).

Problematic Instagram Use refers to an excessive and uncontrolled pattern of utilizing this platform, characterized by symptoms such as persistent mental preoccupation, tolerance (the need to increase usage time to achieve previous satisfaction), withdrawal symptoms (discomfort in case of lack of access), and impairment in daily functioning (8). This phenomenon has attracted considerable attention from mental health researchers in recent years, as growing evidence indicates its association with negative psychological outcomes. Image-based platforms like Instagram, due to their emphasis on idealized representations of life, appearance, and success, can pave the way for upward social comparisons and increase users' psychological vulnerability (9).

One of the most significant negative consequences associated with social network use, particularly among youth and students, is suicidal ideation. Suicidal ideation encompasses a spectrum ranging from vague thoughts about the possibility of ending one's life to planning for completed suicide, and represents one factor that may seriously endanger adolescents and young adults (10). Suicide is the fourth leading cause of death among young people aged 15–29 years (11) and is considered one of the psychiatric emergencies and important issues in the psycho-social domain, which has been increasing due to the growing complexity of interactions in most societies. Based on analyses conducted between 2001 and 2014, the suicide rate in Iran was estimated at approximately 8 per 100,000 population (12). The World Health Organization and the International Association for Suicide Prevention have designated

September 10th as World Suicide Prevention Day, highlighting the global importance of this mental health concern. As one of the leading causes of preventable mortality worldwide, suicide claims more than 800,000 lives annually (13).

Numerous studies have investigated the relationship between social media use and suicidal ideation. For instance, research has shown that excessive Instagram use is significantly associated with increased suicidal ideation among young people (14). However, this relationship is not simple and linear; various mediating variables may play a role in explaining it. One of the most important of these variables is maladaptive perfectionism.

Maladaptive perfectionism is a personality construct characterized by features such as obsessive striving for flawlessness, setting excessively high-performance standards, a tendency toward overly critical self-evaluation, accompanied by constant concern about others' judgments and feelings of failure when unrealistic standards are not met (15). Burns (1980) defined this construct as follows: individuals who maintain high standards, persistently and obsessively strive toward impossible goals, and measure their self-worth in terms of productivity and accomplishment. According to Ellis (1962), individuals' emotional disturbances stem from their "musturbation," and perfectionism, which encompasses irrational beliefs, leads to anxiety and failure to accept reality. In Young's schema theory (1999), maladaptive perfectionism is one of the subcomponents of the dysfunctional schema of unrelenting standards and hypercriticalness.

Image-based social networks like Instagram, by presenting edited and idealized content, can potentially exacerbate maladaptive perfectionism in users (16). Continuous exposure to idealized images of others' lives, appearance, and success can create unrealistic standards in users and lead them toward negative self-evaluation. This process, in turn, can predispose individuals to suicidal ideation. Research has demonstrated that maladaptive perfectionism is associated with increased vulnerability to stress, feelings of failure and hopelessness, and ultimately suicidal ideation (17). In other words, individuals who set unrealistic standards for themselves are at greater risk of suicidal ideation when facing inevitable life failures.

Medical students, due to the competitive nature of their field of study, high educational pressures, elevated expectations from professors and family, and the constant need for academic success, constitute a population vulnerable to both maladaptive perfectionism and mental health problems (18). These students continually face evaluative situations and maintain high standards for their performance. On the other hand, their widespread use of social networks, particularly Instagram, may exacerbate this vulnerability. Nevertheless, limited research has simultaneously examined the relationship between problematic Instagram use and suicidal ideation with the mediating role of maladaptive perfectionism in this specific population.

Based on a comprehensive review of previous research, it becomes evident that no integrated study has yet examined the relationships between problematic Instagram use and suicidal ideation with the mediating role of maladaptive perfectionism within a coherent structural model, particularly among the

medical student population. This is despite the fact that the primary mission of education in medical sciences universities is to nurture capable, competent individuals with mental health; such that they possess the necessary knowledge and skills to maintain and improve people's health status and can correctly identify clients' health problems and make appropriate decisions. Therefore, the present study represents an important step toward presenting a comprehensive structural model in this field and aims to investigate whether maladaptive perfectionism mediates the relationship between problematic Instagram use and suicidal ideation among medical students.

Methods

Study Design

The present study employed a descriptive-correlational design, utilizing Structural Equation Modeling (SEM) to test the structural relationships between variables. This methodological approach allows researchers to examine complex relationships between latent and observed variables simultaneously.

Population, Sample, and Sampling Method

The statistical population comprised all general medicine students (Doctor of Medicine - MD) enrolled at Hamadan University of Medical Sciences during the 2024–2025 academic year ($N = 3,278$). Based on Morgan's table, a minimum of 345 participants was required. To enhance statistical power, 380 questionnaires were distributed, and 362 completed questionnaires were returned (response rate = 95.2%).

Due to logistical constraints (geographical dispersion of students across different faculties, varying clinical schedules, and examination periods), convenience sampling was employed. To minimize selection bias, questionnaires were distributed across all academic years (from first to final year) and on different days and times. Only students enrolled in the general medicine program were included. Inclusion criteria were: (a) enrollment in the Doctor of Medicine (MD) program, (b) completion of at least one academic semester, and (c) provided informed consent.

Instruments

Problematic Instagram Use Scale

The Problematic Instagram Use Scale was developed by Calvo-Francés in 2016 (19). This 12-item instrument is the most recent self-report scale in this field. Items are rated on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Calvo-Francés reported Cronbach's alpha coefficients of 0.91 for females and 0.89 for males, with a split-half reliability coefficient of 0.86 for both genders. In the Iranian context, Mottaghi et al. (2016) reported a Cronbach's alpha of 0.91 for this scale (20).

Suicidal Ideation Scale

The Beck Scale for Suicidal Ideation (BSSI) is a 19-item self-report instrument developed by Beck et al. (1988) to identify and measure the severity of attitudes, behaviors, and plans for suicide during the past week (21). Items are rated on a three-point scale ranging from 0 to 2, with total scores ranging from 0 to 38. The BSSI includes five screening items; if responses indicate active or passive suicidal desire, respondents complete the remaining 14 items. The scale has demonstrated high reliability, with Cronbach's alpha coefficients ranging from 0.87 to 0.97 and test-retest reliability of 0.54 (22).

Tehran Multidimensional Perfectionism Scale: The Tehran Multidimensional Perfectionism Scale (TMPS) is a 30-item instrument developed by Besharat (23) based on previous perfectionism scales (Frost et al., 1990; Hewitt & Flett, 1991) (24–25). This scale assesses three dimensions of perfectionism: self-oriented perfectionism, other-oriented perfectionism, and socially prescribed perfectionism. Items are rated on a five-point Likert scale ranging from 1 to 5. Minimum and maximum scores for each subscale range from 10 to 50. Cronbach's alpha coefficients for self-oriented, other-oriented, and socially prescribed perfectionism subscales, calculated in a sample of 500 university students, were 0.91, 0.90, and 0.81 respectively, indicating good internal consistency (26).

Procedure

After obtaining necessary approvals from the university ethics committee, questionnaires were distributed in paper-and-pencil format across various faculties of Hamadan University of Medical Sciences. Participants were informed about the study objectives, voluntary participation, confidentiality of responses, and their right to withdraw at any time. Written informed consent was obtained from all participants prior to data collection. Completing the questionnaires took approximately 20–25 minutes.

Data Analysis

Data were analyzed using descriptive and inferential statistics. Descriptive statistics, including means and standard deviations, were calculated for all study variables. Prior to inferential analysis, assumptions of normality were assessed. Due to the violation of multivariate normality, the bootstrap resampling method (5,000 resamples) with 95% bias-corrected confidence intervals was employed for parameter estimation and examination of direct and indirect effects. Pearson correlation coefficients were calculated to examine bivariate relationships between variables. Structural Equation Modeling (SEM) was conducted using AMOS version 23 software to test the proposed mediation model. Model fit was evaluated using multiple indices: chi-square to degrees of freedom ratio (χ^2/df), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Comparative Fit Index (CFI), Normed Fit Index (NFI), Incremental Fit Index (IFI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). All statistical analyses were performed using SPSS version 26.

Results

Table 1
Descriptive Statistics of Study Variables

Variable	Mean	SD	Skewness	Kurtosis
Problematic Instagram Use	32.45	8.21	-0.551	-0.258
Maladaptive Perfectionism (Total)	78.63	12.54	0.298	-0.204
- Self-Oriented Perfectionism	28.91	6.23	-0.204	-0.440
- Other-Oriented Perfectionism	24.87	5.96	0.389	-0.144
- Socially Prescribed Perfectionism	24.85	5.87	0.298	-0.204
Suicidal Ideation (Total)	12.76	5.43	0.202	-0.529
- Death Wish	4.82	2.01	-0.582	-1.241
- Suicidal Preparedness	4.01	1.87	0.202	-0.529
- Actual Suicidal Intent	3.93	2.55	2.924	8.748

As shown in Table 1, the mean score for problematic Instagram use was 32.45 (SD = 8.21). Maladaptive perfectionism had a mean total score of 78.63 (SD = 12.54), with self-oriented perfectionism showing the highest mean among subscales (M = 28.91, SD = 6.23). Suicidal ideation yielded a mean total score of 12.76 (SD = 5.43), with the death wish subscale as the most prominent dimension (M = 4.82, SD = 2.01). Skewness and kurtosis values for most variables were within the acceptable range of ± 2 , supporting univariate normality. However, the "actual suicidal intent" subscale showed elevated skewness (2.924) and kurtosis (8.748), justifying the use of bootstrap resampling (5,000 resamples) for inferential analyses

Table 2
Correlation Matrix Among Study Variables

Variable	1	2	3	4	5
1. Problematic Instagram Use	1				
2. Self-Oriented Perfectionism	0.094	1			
3. Other-Oriented Perfectionism	0.093	0.413**	1		
4. Socially Prescribed Perfectionism	-0.101	0.152*	0.195**	1	
5. Suicidal Ideation	-0.060	0.011	-0.143*	-0.012	1
Note: *p < 0.05; **p < 0.01 (two-tailed). Based on bootstrap resampling with 5,000 samples.					

As shown in Table 2, the correlation between problematic Instagram use and suicidal ideation was weak and non-significant ($r = -0.060$, $p = 0.079$), suggesting that the relationship between these two variables is not direct. Among perfectionism dimensions, self-oriented perfectionism showed a moderate positive correlation with other-oriented perfectionism ($r = 0.413$, $p < 0.01$) and a small positive correlation with community-oriented perfectionism ($r = 0.152$, $p < 0.05$). Other-oriented perfectionism was also positively correlated with community-oriented perfectionism ($r = 0.195$, $p < 0.01$). Regarding associations with suicidal ideation, only other-oriented perfectionism demonstrated a significant negative correlation ($r = -0.143$, $p < 0.05$). All correlation coefficients remained below the multicollinearity threshold of 0.85, indicating no concern for collinearity in the subsequent structural equation modeling.

Table 3
Model Fit Indices for Final Structural Model

Fit Index	Abbreviation	Criterion	Obtained Value
Chi-square/df	CMIN/df	< 3	0.927
Goodness of Fit Index	GFI	> 0.90	0.991
Adjusted GFI	AGFI	> 0.85	0.970
Comparative Fit Index	CFI	> 0.90	0.999
Normed Fit Index	NFI	> 0.90	0.977
Incremental Fit Index	IFI	> 0.90	0.999
Root Mean Square Error of Approximation	RMSEA	< 0.08	0.0001
Standardized Root Mean Square Residual	SRMR	< 0.08	0.043

As displayed in Table 3, the final structural model demonstrated excellent fit to the empirical data. The chi-square to degrees of freedom ratio (CMIN/df = 0.927) was below the recommended threshold of 3. The GFI (0.991), CFI (0.999), and NFI (0.977) all exceeded the 0.90 cutoff. The RMSEA (0.0001) was well below 0.08, and the SRMR (0.043) was within the acceptable range. These indices collectively support the validity of the hypothesized model.

Table 4
Direct, Indirect, and Total Effects, Standardized Coefficients (Bootstrap 95%CI)

Effect Type	Path	β	SE	95% CI Lower	95% CI Upper	p-value
Direct	Instagram Use → Suicidal Ideation	-0.150	0.028	-0.128	-0.016	0.018
Direct	Perfectionism → Suicidal Ideation	0.748	0.439	0.406	5.250	< 0.001
Direct	Instagram Use → Perfectionism	0.068	0.084	0.000	0.200	0.237
Indirect	Instagram Use → Perfectionism → Suicidal Ideation	0.090	0.036	0.007	0.149	0.012
Total	Instagram Use → Suicidal Ideation	-0.060	0.038	-0.147	-0.006	0.079
Note: Bootstrap resampling with 5,000 samples. CI = Confidence Interval. SE = Standard Error						
β = standardized coefficients						

Table 4 summarizes the direct, indirect, and total effects derived from the final structural model using bootstrap resampling (5,000 iterations) with 95% bias-corrected confidence intervals. The direct effect of problematic Instagram use on suicidal ideation was negative and significant ($\beta = -0.150$, $SE = 0.028$, $p = 0.018$; 95% CI [-0.128, -0.016]), indicating that Instagram use independently predicts suicidal thoughts among medical students. Maladaptive perfectionism also exerted a significant positive direct effect on suicidal ideation ($\beta = 0.748$, $SE = 0.439$, $p < 0.001$; 95% CI [0.406, 5.250]), demonstrating that perfectionistic concerns are a strong independent predictor of suicide risk. The direct path from problematic Instagram use to maladaptive perfectionism was positive but non-significant ($\beta = 0.068$, $SE = 0.084$, $p = 0.237$; 95% CI [0.000, 0.200]), suggesting that Instagram use may contribute to perfectionism only in combination with other factors.

The indirect effect of problematic Instagram use on suicidal ideation through maladaptive perfectionism was also significant ($\beta = 0.090$, $SE = 0.036$, $p = 0.012$; 95% CI [0.007, 0.149]), as the confidence interval did not include zero. Since both the direct and indirect effects were statistically significant, this pattern is consistent with partial mediation, whereby maladaptive perfectionism partially accounts for the relationship between problematic Instagram use and suicidal ideation, while Instagram use retains an independent direct effect on suicidal thoughts.

Table 5
Standardized Regression Weights of Final Model

Path	Standardized β	SE	Bootstrap 95% CI	p-value (Bootstrap)
Instagram Use → Perfectionism	0.068	0.084	[0.000, 0.200]	0.237
Perfectionism → Suicidal Ideation	0.748	0.439	[0.406, 5.250]	< 0.001
Instagram Use → Suicidal Ideation	-0.150	0.028	[-0.128, -0.016]	0.018

Note *Bootstrap resampling with 5,000 iterations. Bias-corrected 95% confidence intervals are reported. Standard errors (SE) and p-values are based on bootstrap estimates

As shown in Table 5, the path from problematic Instagram use to maladaptive perfectionism was positive but non-significant ($\beta = 0.068$, bootstrap $p = 0.237$, 95% CI [0.000, 0.200]), indicating that Instagram use alone does not reliably predict perfectionism in this sample. The path from maladaptive perfectionism to suicidal ideation was strong, positive, and statistically significant ($\beta = 0.748$, bootstrap $p < 0.001$, 95% CI [0.406, 5.250]), confirming that perfectionism is a robust predictor of suicide risk. The direct path from problematic Instagram use to suicidal ideation was also significant ($\beta = -0.150$, bootstrap $p = 0.018$, 95% CI [-0.128, -0.016]), indicating that Instagram use independently predicts suicidal ideation. Given that both the direct and indirect effects are significant, this pattern is consistent with partial mediation, whereby maladaptive perfectionism partially mediates the relationship between problematic Instagram use and suicidal ideation. The final structural model with standardized coefficients is presented in Fig. 1.

Discussion

The present study aimed to investigate the mediating role of maladaptive perfectionism in the relationship between problematic Instagram use and suicidal ideation among medical students. The findings revealed that while problematic Instagram use does not directly predict suicidal thoughts, it exerts its influence indirectly through the mechanism of maladaptive perfectionism. This partial mediation model offers valuable insights into the complex psychological processes underlying the relationship between social media engagement and mental health outcomes in this vulnerable population. This section discusses the theoretical and practical implications of these findings in light of previous research.

The structural model demonstrated excellent fit to the empirical data based on established criteria (27, 28, 29, 30). Following recommended procedures for mediation analysis (31, 32, 33), bootstrap resampling was employed to test indirect effects.

Descriptive Findings

The descriptive results paint a concerning picture of the psychological state of medical students in this study. The moderate to high levels of perfectionism, particularly in the self-oriented dimension, reflect the internalization of rigorous academic standards that characterize medical education. Medical students constantly operate in environments that reward flawless performance and penalize mistakes, which can gradually shape a perfectionistic mindset where self-worth becomes contingent upon achievement (34, 35). This finding aligns with previous research documenting elevated perfectionism among medical students compared to the general population, suggesting that the medical training environment may selectively attract or cultivate perfectionistic tendencies (35).

Perhaps most alarmingly, over two-thirds of participants were classified as having high suicide risk based on their suicidal ideation scores. This prevalence rate substantially exceeds those reported in many previous studies and signals a mental health crisis within medical education that demands immediate attention (35). The prominence of "desire for death" as the most elevated subscale is particularly noteworthy, as it suggests a passive wish for escape rather than active planning, which may reflect profound exhaustion and hopelessness resulting from chronic academic stress. These findings echo the growing body of literature documenting elevated psychological distress, burnout, and suicidal thoughts among medical students worldwide, reinforcing the notion that the hidden curriculum of medical training may inadvertently compromise student well-being (34, 35).

Regarding Instagram use, the finding that the majority of students fell within the moderate addiction range reflects the pervasive integration of social media into daily life. Medical students, like their peers in other fields, use Instagram for connection, entertainment, and information seeking. However, the image-centric nature of this platform, with its emphasis on curated portrayals of success, beauty, and happiness, creates a unique psychological environment that may interact with pre-existing vulnerabilities such as perfectionism (36, 40).

The Mediating Role of Maladaptive Perfectionism:

The central finding of this study that maladaptive perfectionism partially mediates the relationship between problematic Instagram use and suicidal ideation offers a nuanced understanding of how social media affects mental health. These findings suggest that problematic Instagram use is not merely a passive background factor, but contributes to suicidal ideation both directly and indirectly through the amplification of maladaptive perfectionistic tendencies.

Several theoretical frameworks help explain this mediation mechanism. From a social comparison perspective, Instagram provides an endless stream of idealized images depicting others' achievements, appearances, and lifestyles. For individuals with perfectionistic tendencies, these images are not merely casual content but become benchmarks against which they measure their own worth (36, 37). The gap between one's perceived reality and the idealized representations on Instagram can generate feelings of inadequacy, failure, and self-criticism core features of maladaptive perfectionism. Over time, this process may erode self-esteem and foster hopelessness, ultimately contributing to suicidal ideation.

This interpretation aligns with the work of Lup and colleagues, who found that Instagram use is associated with depressive symptoms primarily through the mechanism of social comparison (36). The present study extends this line of inquiry by identifying maladaptive perfectionism as a specific cognitive-affective pathway through which social comparison exerts its detrimental effects. Students who hold themselves to impossibly high standards are more likely to feel that they fall short when viewing the seemingly perfect lives of others, leading to self-condemnation and despair.

Cognitive theories of perfectionism provide additional insight into this process. According to Hewitt and Flett's model, maladaptive perfectionism involves a discrepancy between one's standards and perceived performance, accompanied by harsh self-evaluation and concerns about others' judgments (37). Instagram may heighten this discrepancy by constantly presenting evidence of others' successes while obscuring the struggles, failures, and ordinary moments that constitute authentic human experience. The platform thus becomes a mirror that reflects an unattainable ideal, reinforcing perfectionists' belief that they are never good enough.

The finding that maladaptive perfectionism strongly predicted suicidal ideation is consistent with an extensive body of research linking perfectionism to suicide risk (38, 39). Perfectionistic individuals often experience intense shame and self-criticism when they perceive themselves as failing to meet their standards. These emotional experiences can become unbearable, leading to thoughts of escape through death. The perfectionism-suicide link may be particularly pronounced in medical students, whose identity and self-worth are closely tied to academic performance and who face constant evaluation from faculty, peers, and themselves (34, 35, 39).

The Indirect Pathway from Instagram Use to Suicidal Ideation:

The significant indirect effect of problematic Instagram use on suicidal ideation through maladaptive perfectionism suggests that Instagram may function as a perfectionism-amplifying environment. This interpretation is supported by qualitative research indicating that social media platforms encourage users to present idealized versions of themselves, creating a culture of performance and impression management (40, 43). For medical students already predisposed to perfectionism, this culture may intensify their drive to appear flawless and their fear of being exposed as inadequate.

The mechanisms through which Instagram amplifies perfectionism are multifaceted. First, the platform's algorithmic design prioritizes engaging content, which often means highly curated, emotionally charged, or extreme representations. Users are thus exposed to a skewed sample of human experience that overrepresents success and happiness while underrepresenting struggle and ordinariness (40, 41). Second, features such as likes, comments, and follower counts provide quantifiable feedback that can become metrics of self-worth for perfectionistic individuals. Third, the permanent and searchable nature of Instagram content means that past "failures" or imperfect posts can haunt users, reinforcing their belief that they must maintain flawless presentation at all times.

These dynamics may be particularly potent for medical students, who are navigating a critical period of identity formation while facing unprecedented academic demands. The combination of developmental vulnerability, environmental stress, and exposure to perfectionism-amplifying media may create a perfect storm that erodes mental health (34, 35, 44).

Comparison with Previous Studies:

The findings of this study both align with and extend previous research in several important ways. The partial mediation model is consistent with studies suggesting that the relationship between social media use and mental health outcomes is often indirect and depends on individual difference variables (41, 42, 44). For example, research has shown that the association between Facebook use and depression is mediated by social comparison and envy (41, 42), while the link between Instagram use and body image concerns is mediated by internalization of appearance ideals (43).

The present study uniquely identifies maladaptive perfectionism as a mediator, contributing to a more nuanced understanding of why some individuals are more vulnerable to the negative effects of social media than others. This finding resonates with the differential susceptibility framework, which posits that media effects are moderated by individual characteristics (44). Medical students with perfectionistic tendencies may be precisely those most susceptible to the harmful aspects of Instagram, while their less perfectionistic peers may use the platform without experiencing adverse effects.

The significant direct effect of problematic Instagram use on suicidal ideation, alongside the significant indirect effect through maladaptive perfectionism, suggests that both pathways warrant clinical attention. Interventions addressing maladaptive perfectionism remain important, but should be complemented by strategies that directly target problematic social media use, as Instagram appears to independently contribute to suicide risk in this population. This finding aligns with a growing recognition in mental health research that focusing on transdiagnostic processes such as perfectionism, emotion regulation, or cognitive biases may yield greater public health benefits than targeting specific behaviors or disorders (45, 47).

Implications for Practice:

These findings have several important implications for mental health practice within medical education settings. First, they highlight the need for routine screening for perfectionism and suicidal ideation among medical students. Given the high prevalence of suicide risk observed in this study, early identification of at-risk students is essential for timely intervention. Screening programs should assess not only overt symptoms of distress but also personality characteristics such as perfectionism that may confer vulnerability (35, 39).

Second, interventions targeting maladaptive perfectionism may be particularly beneficial for medical students who engage heavily with social media. Cognitive-behavioral approaches that help students challenge unrealistic standards, develop self-compassion, and separate self-worth from achievement have shown promise in reducing perfectionism and its associated distress (46, 47). These interventions

could be adapted to address perfectionism in the context of social media use, helping students critically evaluate the idealized content they encounter and resist the impulse to engage in harmful social comparisons.

Third, medical schools should consider broader structural and cultural changes to reduce the environmental pressures that foster perfectionism. This might include emphasizing learning and growth over flawless performance, providing more supportive feedback, normalizing struggles and failures as part of the learning process, and reducing unnecessary competition among students (48). Creating a learning environment that values well-being alongside achievement may help prevent the development of maladaptive perfectionism in the first place.

Fourth, psychoeducation about the nature of social media and its potential psychological effects should be integrated into medical school curricula. Helping students understand that Instagram presents a curated and unrealistic version of reality may reduce its power to trigger harmful social comparisons (40). Teaching students to use social media mindfully—for example, by curating their feeds to include diverse and authentic content, limiting passive consumption, and taking breaks when needed may help mitigate its negative effects (49, 50).

Limitations and Future Directions:

Several limitations should be considered. First, the cross-sectional design precludes causal inferences; longitudinal studies are needed. Second, convenience sampling and single-center design limit generalizability; future research should employ probability sampling across multiple medical schools. Third, the sample was restricted exclusively to general medicine (MD) students; findings may not generalize to other medical sciences disciplines (e.g., nursing, pharmacy, dentistry) or to non-medical populations. Fourth, self-report measures may introduce social desirability bias; future studies could use objective Instagram tracking and clinical interviews. Fifth, we focused solely on maladaptive perfectionism; other mediators should be examined. Despite these limitations, the study's strengths include a large sample, excellent model fit, and rigorous bootstrap analysis.

Conclusion

In conclusion, this study demonstrates that maladaptive perfectionism partially mediates the relationship between problematic Instagram use and suicidal ideation among medical students. While Instagram both directly and indirectly predicts suicidal ideation, the indirect pathway operates through the amplification of maladaptive perfectionistic tendencies, which in turn significantly increase the risk of suicidal ideation. These findings underscore the importance of considering individual difference variables when examining the mental health effects of social media and highlight the need for perfectionism-focused interventions in medical education settings. By addressing the perfectionism-amplifying features of both the medical training environment and social media platforms, educators and mental health professionals may help reduce the alarming rates of suicide risk observed among medical students.

Declarations

Ethics approval and consent to participate

Ethical approval:

This study was conducted in full accordance with the ethical principles for research involving human participants as outlined in the Declaration of Helsinki. Prior to data collection, ethical approval was obtained from the Research Ethics Committee of the Hamadan Branch, Islamic Azad University (Ethical Approval Code: IR.IAU.H.REC.1404.028).

Consent to participate:

All participants were provided with comprehensive information regarding the purpose of the study, the voluntary nature of their participation, and their right to withdraw at any time without any consequences. Written informed consent was obtained from all participants before they completed the questionnaires. Participants were assured of the confidentiality and anonymity of their responses, and all data were anonymized prior to analysis to protect participant identity. Given the sensitive nature of the topic (suicidal ideation), information about mental health support services was made available to all participants, and researchers remained available to address any concerns or distress that might have arisen during data collection.

Consent for publication

Not Applicable.

Conflict of Interest

The authors declare that they have no conflicts of interest in connection with this research. This study was conducted independently, and there were no financial, commercial, or personal relationships that could potentially influence the research design, data collection, analysis, interpretation, or publication of findings. No external funding was received for this research, and all authors maintained full independence in all aspects of the study.

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Author Contribution

S.Y, S.SH.R and A.M. conceived and designed the study. S.SH.R coordinated the research process and served as the corresponding author. S.SH.R performed the statistical analysis and contributed to data interpretation. A.M. and S.Y. contributed to data collection and initial manuscript drafting. S.Y., and S.SH. R. wrote the first draft of the manuscript. All authors contributed to manuscript revision, read, and approved the final version.

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Data Availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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Figures

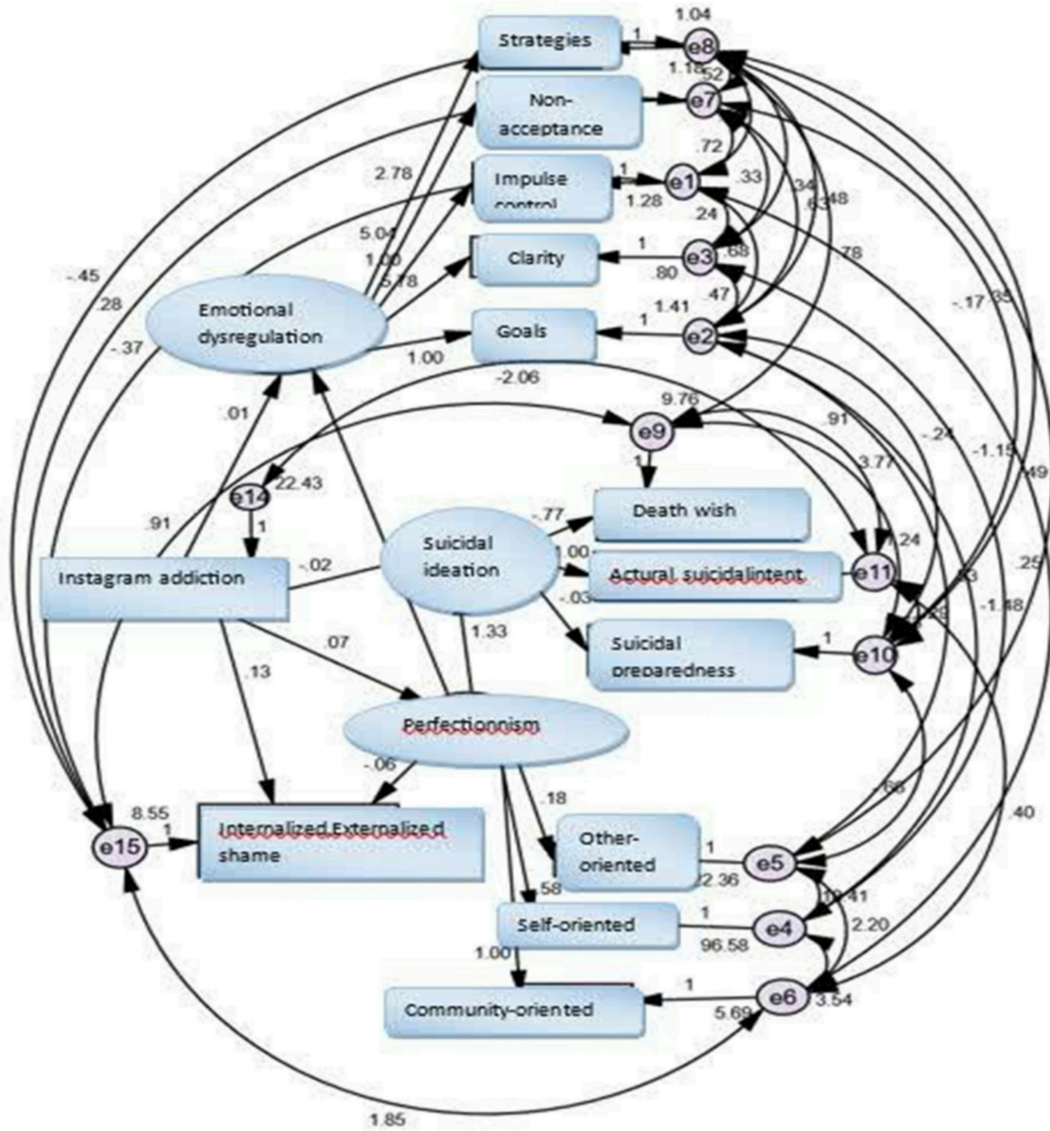


Figure 1

presents the final structural model with standardized coefficients