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Exploring the Relationship Between Mindfulness, Cognitive Flexibility, and Perceived Stress Among Adults

Aiman Aftab (Corresponding Author)

BS Applied Psychology, Department of Psychology, National University of
Modern Languages, Islamabad, Pakistan

aimanaftab419@gmail.com

Syeda Mahrukh Waqar

MS Clinical Psychology, Department of Psychology, National University of
Modern Languages, Islamabad, Pakistan

mahrukh.waqar@live.com

Ayesha Yashfeen

BS Applied Psychology, Department of Psychology, National University of
Modern Languages, Islamabad, Pakistan

ayeshayashfeen4@gmail.com

Abstract

Stress is a common issue that affects physical health, emotional stability, and cognitive performance. Mindfulness, defined as non-judgmental present-moment awareness, plays a key role in lowering perceived stress and improving well-being. With an emphasis on gender differences, this study investigates the relationships among perceived stress, cognitive flexibility, and mindfulness. The Cognitive Flexibility Scale (CFS-12), Perceived Stress Scale (PSS-10), and Five Facet Mindfulness Questionnaire (FFMQ-39) were used in a cross-sectional study of 336 adults aged 18 years and older. Independent-samples t-tests examined gender differences, and Pearson correlation coefficients evaluated associations among mindfulness, cognitive flexibility, and perceived stress. Results showed a significant negative correlation between perceived stress and mindfulness ($r = -0.233$, $p < 0.01$), with mindfulness linked to reduced stress levels. Cognitive flexibility correlated positively with mindfulness ($r = 0.164$, $p < 0.01$) and weakly with perceived stress ($r = 0.150$, $p < 0.01$). Females reported higher perceived stress ($M = 26.49$, $SD = 7.08$) than males ($M = 24.65$, $SD = 5.42$), $t(333) = -2.667$, $p = 0.008$. Cognitive flexibility and mindfulness did not differ significantly by gender. Regression results further showed that mindfulness was a significant negative predictor of perceived stress ($\beta = -.23$, $p < .001$) and a significant positive predictor of cognitive flexibility ($\beta = .16$, $p = .003$). The findings highlight the importance of mindfulness and cognitive flexibility in reducing perceived stress and suggest that gender-specific approaches may enhance stress-management interventions.

Keywords: *Mindfulness, Cognitive Flexibility, Perceived Stress, Gender Differences, Psychological Well-being.*

Introduction

Stress has become a persistent and widespread burden in modern society, where professional, educational, and personal demands continue to increase. High levels of perceived stress are linked to various negative outcomes, including impairments in cognitive functioning, emotional stability, and physical health. According to Lazarus and Folkman (1984), perceived stress refers to the degree to which individuals appraise situations in their lives as stressful. Because stress influences many aspects of functioning, identifying effective coping mechanisms has become essential.

Mindfulness has gained increasing attention in contemporary psychological interventions for its potential to alleviate stress. It involves developing non-judgmental awareness of the present moment, enabling individuals to observe their thoughts, feelings, and bodily sensations with openness and acceptance (Kabat-Zinn, 1994). Research demonstrates that mindfulness-based interventions reduce stress, improve emotional regulation, and enhance psychological well-being (Shapiro et al., 2006). However, the precise cognitive mechanisms underlying these effects are not yet fully understood. One possible mechanism is cognitive flexibility, defined as the ability to adapt one's thoughts and behaviors to changing circumstances or new information (Dennis & Vander Wal, 2010).

Cognitive flexibility enables individuals to reassess stressors, reframe challenges, and adopt adaptive coping strategies. Individuals with greater cognitive flexibility tend to manage stress more effectively by altering their perspectives and behaviors. Studies indicate that mindfulness may enhance cognitive flexibility, which in turn supports stress reduction (Moore & Malinowski, 2009). Thus, cognitive flexibility may serve as a mediating process explaining how mindfulness contributes to lower perceived stress.

These relationships can also be understood through the Transactional Model of Stress and Coping proposed by Lazarus and Folkman (1984). According to this model, stress arises not only from external demands but from how individuals appraise and interpret those demands. Mindfulness may influence the primary appraisal process by helping individuals perceive stressful situations more neutrally, while cognitive flexibility supports the secondary appraisal process by enabling them to adjust their coping strategies when challenges arise. Together, these psychological processes can lower perceived stress by improving emotional regulation and adaptive coping.

Guided by this framework, the present study explores how mindfulness and cognitive flexibility interact in predicting perceived stress among adults and examines whether these relationships differ by gender.

Mindfulness and cognitive flexibility are conceptually interconnected. Mindfulness enhances attention regulation and present-moment awareness, which support flexible cognitive responses. In turn, cognitive flexibility allows individuals to shift mental perspectives, enabling them to appraise stressors more constructively (Bishop et al., 2004; Brown & Ryan, 2003; Cheng, 2003). Together, these processes promote adaptive functioning and resilience. Individuals high in mindfulness often demonstrate improved cognitive flexibility, resulting in better stress tolerance and emotional regulation (Moore & Malinowski, 2009; Murphy et al., 2012). Therefore, mindfulness indirectly reduces perceived stress by fostering cognitive flexibility (Ozcan, 2019).

Mindfulness involves fully experiencing thoughts and emotions without over-engagement or avoidance. It requires continuous, nonjudgmental observation of internal and external stimuli (Baer, 2003). Dimidjian and Linehan (2003) identified three essential facets of mindfulness: observing with awareness, describing experiences, and engaging in the present moment nonjudgmentally. Practicing mindfulness helps individuals remain aware of their experiences without reacting impulsively, which promotes composure under stress. Although mindfulness clearly reduces stress, researchers continue to explore its underlying psychological mechanisms. As Hanh (1975) poetically noted, mindfulness enables individuals to reclaim their scattered minds and experience life with unity and clarity.

Cognitive flexibility complements this process by allowing individuals to adapt their thinking and behavior to dynamic contexts. It refers to the mental ability to shift between tasks, perspectives, or strategies, enabling effective problem-solving and adaptive functioning (Scott, 1962; Miyake et al., 2000). In everyday life, cognitive flexibility manifests in multitasking, switching communication styles, and adjusting to unpredictable social or professional situations. Individuals high in cognitive flexibility tend to perceive stressful situations as manageable challenges rather than threats, which reduces emotional distress. This adaptability may explain why mindfulness practitioners often display superior cognitive flexibility.

Perceived stress, in contrast, represents the subjective interpretation of stressors rather than their objective presence (Cohen et al., 1983). It reflects how individuals evaluate their capacity to cope with life's demands. Because perceived stress strongly predicts mental health outcomes such as anxiety and depression, identifying factors that reduce it is essential (Shah et al., 2010). Mindfulness and cognitive flexibility are promising protective factors. Mindfulness promotes acceptance and emotional balance, while cognitive flexibility fosters adaptive problem-solving and perspective-taking.

Empirical evidence supports these links. Mindfulness interventions significantly reduce perceived stress and enhance resilience (Bartlett et

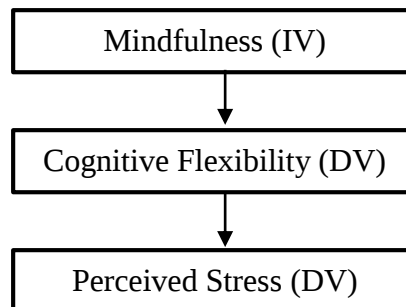
al., 2019; Bostock et al., 2019). Cognitive flexibility similarly predicts adaptive coping and lower emotional distress (Dennis & Vander Wal, 2010). When combined, mindfulness and cognitive flexibility form a powerful framework for stress regulation, enabling individuals to reinterpret challenges, regulate emotions, and maintain psychological stability.

The present study explores the interrelationships among mindfulness, cognitive flexibility, and perceived stress in adults, with particular attention to gender differences. Understanding these relationships can inform the development of more effective stress-management interventions. Specifically, this research seeks to determine whether mindfulness reduces stress through the enhancement of cognitive flexibility and whether gender differences influence these dynamics. Findings may provide valuable insights for designing mindfulness-based programs that promote flexibility, resilience, and mental well-being.

Building on previous evidence, the present study not only examined correlations among mindfulness, cognitive flexibility, and perceived stress but also explored how mindfulness predicts perceived stress and cognitive flexibility. By using regression analysis, the study aimed to clarify how mindfulness contributes to reducing stress and enhancing cognitive adaptability.

Figure 1

Conceptual Framework showing the relationship among Mindfulness, Cognitive Flexibility, and Perceived Stress.



Literature Review

Goldberg, Hoyt, Del Re, and Flückiger (2013) investigated the role that mindfulness practice quality plays in improving psychological outcomes. They introduced the Practice Quality–Mindfulness (PQ-M) measure, focusing on response and attention, and recruited 99 participants from an eight-week Mindfulness-Based Stress Reduction (MBSR) program. Reductions in stress, anxiety, and sadness were significantly correlated with increases in practice quality ($B = 2.22$, $p < 0.05$). Participants with lower baseline mindfulness showed larger increases in practice quality, highlighting the importance of practice quality over frequency or duration in mindfulness therapies.

To assess the viability of a culturally adopted mindfulness-based intervention (MTC) for stress reduction among Pakistani university students, Sarfraz, Siddiqui, Galante, and Sikander (2023) conducted a pilot randomized controlled experiment. Participants received eight weekly online mindfulness sessions focusing on compassion and body awareness. Quantitative results showed significant increases in mindfulness, decreased stress, and improved psychological well-being. Despite a high attrition rate, the intervention was well-received, demonstrating the promise of online mindfulness programs in low-resource settings.

Martin and Anderson (1998) examined the Cognitive Flexibility Scale (CFS) and found cognitive flexibility strongly correlated with assertiveness and responsiveness, showing that flexible individuals adapt communication strategies effectively. They also compared self-reported flexibility with ratings from close friends, finding moderate but significant agreement ($r = 0.35$, $p < 0.05$), supporting the validity of the scale. Additional research showed that cognitive flexibility improves self-assurance and adaptation across communication contexts.

The Perceived Stress Scale (PSS) developed by Cohen, Kamarck, and Mermelstein (1983) measures perceived stress through components such as overload and unpredictability. Validation studies found the PSS significantly correlated with life-event impacts, health symptoms, and depression, confirming its reliability and predictive validity. Its sensitivity to short-term stress changes and applicability across populations made it a standard tool for assessing perceived stress.

Stress among Pakistani students is notably high due to academic pressure and social expectations. Shah et al. (2010) reported higher perceived stress among female medical students, citing workload and psychosocial factors as major contributors.

Moore (2012) explored the link between flow disposition, mindfulness, and cognitive flexibility, finding both mindfulness and flexibility as significant predictors of flow. Zou et al. (2020) found that MBSR training improved cognitive flexibility, mediated by non-reactivity. Demirtas and Yildiz (2019) reported that low flexibility and high uncertainty intolerance increased perceived stress, with flexibility acting as a mediator between hopelessness and stress.

Guassi Moreira et al. (2020) found that reappraisal tendency, but not reappraisal capacity, was related to lower perceived stress, suggesting subjective self-perceptions of reappraisal predict stress more accurately than objective measures. Wu et al. (2022) also reported that both mindfulness and cognitive flexibility negatively correlated with perceived stress and mediated the link between stress and distress tolerance, emphasizing their joint role in emotional resilience.

Workplace mindfulness studies show consistent benefits. Hülshager et al. (2013) found mindfulness reduced emotional exhaustion and improved

job satisfaction. Beer et al. (2020) reported that mindfulness training lowered occupational and personal stress among social workers, while Poulin et al. (2008) demonstrated reduced burnout among human service professionals.

Good et al. (2016) showed that mindfulness enhances adaptive emotional responses under stress. Moore and Malinowski (2009) found that mindfulness meditation promotes flexible, open thinking, while Zeidan et al. (2010) observed that short-term mindfulness interventions improved cognitive flexibility and perspective shifting. Lu et al. (2014) confirmed that mindfulness increased flexibility and emotional control among students, and Jha et al. (2010) found mindfulness training improved adaptability in military personnel.

Martin and Rubin (1995) demonstrated that individuals with high cognitive flexibility reframe stressful situations to lessen emotional impact. Johnco et al. (2014) emphasized that flexibility fosters creative, adaptive responses to stressors, while Dennis and Vander Wal (2010) linked flexible coping strategies with lower stress levels. Cognitive flexibility strengthens resilience by enabling adaptation to change (Southwick et al., 2005), whereas chronic stress can impair flexibility, causing repetitive negative thoughts (Dajani & Uddin, 2015). Kashdan and Rottenberg (2010) noted that flexible thinkers perceive greater control, reducing perceived stress and enhancing well-being.

Collectively, these studies underscore the importance of mindfulness and cognitive flexibility in reducing perceived stress. Mindfulness facilitates emotional regulation, while flexibility supports adaptive coping and reappraisal. Their integration forms a strong psychological framework for stress management. However, gaps remain regarding gender differences and adult populations, justifying the present study, which examines the interrelationships among mindfulness, cognitive flexibility, and perceived stress among adults.

Method

Participants

The sample consisted of 336 adults, including both males and females, aged between 18 and 45 years ($M = 26.31$, $SD = 5.48$). Participants were recruited through convenience sampling from different regions of Pakistan. Inclusion criteria required participants to be fluent in English and have access to the internet to complete the online questionnaire. Individuals with any diagnosed psychiatric condition or current psychological treatment were excluded to minimize confounding variables.

The sample comprised 127 males (37.8%) and 209 females (62.2%). Most participants were university students (63.4%), while the remainder included employed and self-employed individuals. The gender distribution allowed for comparisons across male and female participants in perceived stress, mindfulness, and cognitive flexibility levels.

Instruments

Demographic Information Form

Participants provided demographic details, including age, gender, educational status, and occupation, through a self-developed demographic form.

Perceived Stress Scale (PSS-10; Cohen et al., 1983)

The Perceived Stress Scale measures the degree to which individuals perceive situations in their lives as stressful. The 10-item version (PSS-10) uses a 5-point Likert scale ranging from 0 (never) to 4 (very often). Higher scores indicate greater perceived stress. The PSS-10 has shown high internal consistency ($\alpha = .84$) and test-retest reliability ($r = .85$). In the current study, the Cronbach's alpha reliability was .80, indicating satisfactory internal consistency.

Cognitive Flexibility Scale (CFS; Martin & Rubin, 1995)

The Cognitive Flexibility Scale assesses an individual's ability to adapt to new or changing situations. It consists of 12 items rated on a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). Higher scores indicate greater cognitive flexibility. The original authors reported high internal reliability ($\alpha = .83$). In this study, the scale also demonstrated strong reliability with $\alpha = .82$.

Five Facet Mindfulness Questionnaire (FFMQ-39; Baer et al., 2006)

The FFMQ-39 is a comprehensive measure of mindfulness that assesses five facets: observing, describing, acting with awareness, nonjudging of inner experience, and nonreactivity to inner experience. The questionnaire includes 39 items rated on a 5-point Likert scale (1 = never or very rarely true, 5 = very often or always true). Higher scores represent greater mindfulness. The instrument has shown good internal consistency across subscales ($\alpha = .75$ to $.91$). In the present study, overall internal reliability was $\alpha = .88$.

Procedure

Data were collected through an online survey distributed via social media platforms such as WhatsApp, Facebook, and email. Before participation, respondents were informed about the purpose of the study, ensured of confidentiality, and asked to provide informed consent. Participation was voluntary, and no monetary compensation was provided.

After giving consent, participants completed the demographic form followed by the PSS-10, CFS, and FFMQ-39 questionnaires. The total completion time was approximately 10–15 minutes. Data were screened for incomplete responses and outliers before analysis.

Ethical Considerations

Ethical approval for this study was obtained from the Departmental Research Committee of the Department of Psychology, National University of Modern Languages, Islamabad. Participants were informed that their participation was voluntary and that they could withdraw at

any time without penalty. Anonymity and confidentiality were maintained throughout the research process. All responses were used solely for academic purposes.

Data Analysis

Statistical analysis was conducted using IBM SPSS Statistics Version 26. Descriptive statistics, including means and standard deviations, were calculated for all variables. Pearson product-moment correlations were used to examine relationships between mindfulness, cognitive flexibility, and perceived stress. Independent-samples t-tests were conducted to assess gender differences. In addition, multiple regression analyses were conducted to determine how mindfulness predicts perceived stress and cognitive flexibility. All tests were two-tailed with a significance level of $p < .05$.

Results

Table 1

Demographic Characteristics of the Participants

Characteristics	<i>n</i>	(%)
Gender		
Male	165	49
Female	169	50
Prefer not to say	2	0.6
Marital Status		
Single	193	57.3
Married	130	38.6
Other	13	3.9
Employment Status		
Student	122	36.2
Fulltime Employed	81	24
Part-time Employed	74	22
Unemployed	44	13
Self-employed	14	4.2
Retired	1	0.3
Education Level		
Bachelor's Degree	169	50.1
Associate Degree	92	27.3
Masters	48	14.2
Above	27	8
Living Arrangement		
Nuclear	178	52.8
Joint	158	46.9
Stress Level		
Low	58	17.2
Moderate	129	38.3
High	108	32
Very High	41	12.2
Any pre-mental health condition		
Yes	17	5
No	309	91.7
Prefer not to say	10	3

n = Frequency, % = percentage

Among 336 participants, 165 were male (49%), 169 female (50.1%), and two (0.6%) preferred not to disclose gender. Most were single ($n = 193$, 57.3%), 130 were married (38.6%), and 13 (3.9%) identified as other. Regarding education, 169 (50.1%) held a bachelor's degree, 92 (27.3%) an associate degree, 48 (14.2%) a master's degree, and 27 (8%) a qualification above master's level. Employment status included 122 students (36.2%), 81 full-time employees (24%), 74 part-time (22%), 44 unemployed (13%), 14 self-employed (4.2%), and one retired (0.3%). Living arrangements indicated 178 (52.8%) lived in nuclear families and 158 (46.9%) in joint families. Stress levels varied: 58 (17.3%) reported low, 120 (35.7%) moderate, and the remaining participants reported high stress. Forty-one (12.2%) had pre-existing mental health conditions; 290 (86.3%) did not, and five (1.5%) preferred not to disclose.

Table 2

Psychometric Properties of the Study Variables (N = 219)

Scales	<i>M</i>	<i>SD</i>	Range	Cronbach's α
Five Facet Mindfulness Questionnaire	116.66	8.1	86-149	0.880
Observing	24.24	4.61	8-40	0.6
Describing	24.49	3.33	9-35	0.10
Acting with awareness	23.14	5.17	8-40	0.7
Non-judging of inner experience	23.03	5.01	8-40	0.7
Non-reactivity of inner experience	21.8	4.26	7-35	0.6
Cognitive Flexibility	42.95	5.39	32-60	0.731
Perceived Stress Scale	25.61	6.39	12-50	0.693
Perceived Helplessness	19.31	3.71	6-30	0.516
Lack of self-efficacy	16.29	4.21	0-20	0.538

M = Mean, SD = Standard Deviation

The Five Facet Mindfulness Questionnaire (FFMQ) showed a mean of 116.66 ($SD = 8.1$) with excellent reliability ($\alpha = .880$). Subscales yielded the following: Observing ($M = 24.24$, $SD = 4.61$, $\alpha = .60$), Describing ($M = 24.49$, $SD = 3.33$, $\alpha = .10$), Acting with Awareness ($M = 23.14$, $SD = 5.17$, $\alpha = .70$), Non-Judging of Inner Experience ($M = 23.03$, $SD = 5.01$, $\alpha = .70$), and Non-Reactivity of Inner Experience ($M = 21.8$, $SD = 4.26$, $\alpha = .60$). Cognitive Flexibility ($M = 42.95$, $SD = 5.39$) demonstrated good reliability ($\alpha = .731$). The Perceived Stress Scale ($M = 25.61$, $SD = 6.39$) showed acceptable reliability ($\alpha = .693$). Subscales Perceived Helplessness ($M = 19.31$, $SD = 3.71$, $\alpha = .516$) and Lack of Self-Efficacy ($M = 16.29$, $SD = 4.21$, $\alpha = .538$) had lower reliability.

Table 3

Correlation Matrix of Study Variables (N = 336)

No.	Variables	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.
I.	Observing	-									
II.	Describing	.164 **	-								
III.	Acting with awareness	-.440 **	.072	-							
IV.	Non-judgmental of inner experience	-.555 **	-.094	.589 **	-						
V.	Non-reactivity of inner experience	.535 **	.158 **	-.485 **	-.583 **	-					
VI.	Mindfulness	.296	.487 **	.469 **	.335	.227 **	-				
VII.	Cognitive Flexibility	.195 **	.111 *	-.023	-.077	.132 *	.164 **	-			
VIII.	Perceived Helplessness	.432 **	-.007	-.513 **	-.541 **	.451 **	-.18* *	.137 *	-		
IX.	Lack of Self-empathy	.107	-.017	-.260 **	-.286 **	.198 **	-.19* *	.107	.299* *	-	
X.	Perceived Stress	.321 **	-.015	-.470 **	-.502 **	.393 **	-.23* *	.150 **	.778* *	.832* *	-

* $p < 0.05$, ** $p < 0.01$

Mindfulness correlated positively with cognitive flexibility ($r = .164$, $p < .01$), indicating higher mindfulness relates to greater flexibility. The Describing subscale correlated strongly with overall mindfulness ($r = .487$, $p < .01$). Mindfulness was negatively correlated with perceived stress ($r = -.233$, $p < .01$). Acting with Awareness correlated negatively with perceived stress ($r = -.470$, $p < .01$), as did Non-Judging of Inner Experience ($r = -.502$, $p < .01$). Non-Reactivity of Inner Experience correlated positively ($r = .393$, $p < .01$), suggesting that higher reactivity contributes to increased stress. These findings highlight associations among mindfulness, cognitive flexibility, and stress, emphasizing the role of mindfulness facets in psychological well-being.

Table 4

Mean, Standard Deviations, and t-values for Male and Female Adults on Mindfulness, Cognitive Flexibility, and Perceived Stress (N = 336)

Variables	Male		Female		<i>t</i> (333)	<i>p</i>	Cohen's <i>d</i>
	<i>M</i>	<i>S.D</i>	<i>M</i>	<i>S.D</i>			
Mindfulness	116.83	8.235	116.49	7.917	.392	.695	.043
Cognitive Flexibility	42.84	5.429	43.08	5.390	-.405	.686	-.044
Perceived Stress	24.65	5.422	26.49	7.082	-2.667	.008	-.291

Independent samples *t*-tests compared males and females. No significant differences were found for mindfulness, $t(333) = 0.392$, $p = .695$, Cohen's $d = .043$, or for cognitive flexibility, $t(333) = -0.405$, $p = .686$, $d = -.044$. However, females ($M = 26.49$, $SD = 7.08$) reported higher perceived stress than males ($M = 24.65$, $SD = 5.42$), $t(333) = -2.667$, $p = .008$, $d = -.291$. Mindfulness and cognitive flexibility were similar across genders, while stress was higher among females.

Table 5

Multiple Regression Analysis on Perceived Stress by Mindfulness (N = 336)

Variables	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>	95% CI	
						<i>LL</i>	<i>UL</i>
Constant	46.7	4.95		9.45	< .001	37.01	56.46
Mindfulness	-.18	.04	-.23	-4.28	< .001	-.26	-.09

$R = .23$, $R^2 = .05$, $\Delta R^2 = .052$ ($F = 18.33^{**}$)

$^{**}p < .001$

Regression analysis showed that mindfulness significantly predicted perceived stress, $\beta = -.23$, $t = -4.28$, $p < .001$. The model explained 5.2% of the variance in perceived stress ($R^2 = .052$, $F(1, 334) = 18.33$, $p < .001$). Mindfulness negatively predicted stress, and the relation is statistically significant.

Table 6

Multiple Regression Analysis on Cognitive Flexibility by Mindfulness (N = 336)

Variables	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>	95% CI	
						<i>LL</i>	<i>UL</i>
Constant	30.11	4.23		7.12	< .001	21.79	38.43
Mindfulness	.11	.04	.16	3.04	.003	.039	.181

$$R = .16, R^2 = .03, \Delta R^2 = .027 (F = 9.27^{**})$$

***p < .001*

Mindfulness significantly predicted cognitive flexibility in a positive direction, $\beta = .16$, $t = 3.04$, $p = .003$. The model explained 2.7% of the variance ($R^2 = .027$, $F(1, 334) = 9.27$, $p = .003$). Mindfulness significantly predicted Cognitive Flexibility in a positive direction ($\beta = .16$, $p = .003$).

Discussion

The growing demands of modern society continue to make stress a major mental health concern. Although mindfulness has been extensively studied for its role in reducing stress through self-awareness and emotional regulation, the relationship between cognitive flexibility and perceived stress remains less understood. This study investigated how mindfulness, cognitive flexibility, and perceived stress interact and how these associations vary by gender among 336 adults.

Results showed a significant negative correlation between mindfulness and perceived stress, confirming mindfulness as a strong predictor of stress reduction. Subscales such as Acting with Awareness and Non-judging of Inner Experience further emphasized the importance of present-moment attention and nonjudgmental acceptance. Cognitive flexibility was positively related to mindfulness but showed only a weak, positive correlation with perceived stress, suggesting that flexibility alone does not necessarily lower stress levels. Mindfulness appears to reduce stress through self-awareness and emotional control, while cognitive flexibility may influence how stress is perceived, for example, through reframing or problem-solving.

Gender analysis revealed that females reported higher perceived stress than males, though no gender differences emerged for mindfulness or cognitive flexibility. This supports prior research showing that women experience higher stress due to social, biological, and role-related factors. These findings underscore the need for gender-sensitive stress management strategies.

Regression analysis further supported these relationships. Mindfulness significantly predicted perceived stress in a negative direction ($\beta = -.23$, $p < .001$), accounting for 5.2% of the variance. This finding confirms that mindfulness independently contributes to reducing perceived stress levels, beyond other possible influences. Individuals with higher mindfulness reported lower perceived stress, highlighting mindfulness as a key psychological buffer against stress. Similarly, mindfulness significantly predicted cognitive flexibility in a positive direction ($\beta = .16$, $p = .003$), explaining 2.7% of the variance. This result suggests that individuals who are more mindful also tend to display higher levels of adaptability and openness to change. Together, these analyses strengthen the understanding that mindfulness not only lowers stress directly but

also fosters the development of flexible thinking that may further assist in stress regulation.

Overall, the findings of this study emphasize the importance of mindfulness and cognitive flexibility in managing perceived stress. Mindfulness enables individuals to observe stressful experiences with openness and acceptance, while cognitive flexibility allows them to reinterpret and manage these experiences more adaptively. Together, they create a balanced approach toward emotional regulation and resilience. These findings align with theoretical models such as the Transactional Model of Stress and Coping (Lazarus & Folkman, 1984), which highlight appraisal and coping as key factors in stress perception. By influencing both appraisal and coping processes, mindfulness and cognitive flexibility serve as essential psychological resources for reducing perceived stress.

Limitations

This study relied on self-reported data, which may involve memory or social desirability biases. Its cross-sectional design limits causal conclusions. Some subscales, such as Describing and Perceived Helplessness, showed lower reliability, which may have affected accuracy. The sample primarily included educated individuals, restricting generalizability to broader or less literate populations. Cultural, socioeconomic, and clinical variations were not examined, which may further influence stress and flexibility.

Suggestions

Future research should employ experimental or longitudinal designs to establish causality between mindfulness, cognitive flexibility, and perceived stress. Enhancing the psychometric strength of subscales with lower reliability is recommended. Broader and more diverse samples, including different socioeconomic and cultural groups, should be considered. Intervention-based research, such as mindfulness training or flexible thinking workshops, may help clarify how these constructs interact over time. Studies involving clinical populations could also guide tailored therapeutic approaches.

Conclusion

This study highlights the complex interplay among mindfulness, cognitive flexibility, and perceived stress. The regression results further confirmed that mindfulness plays a significant role in lowering perceived stress and improving cognitive flexibility. Mindfulness significantly lowers stress through awareness, self-regulation, and nonjudgmental acceptance, while cognitive flexibility has a weaker, indirect influence. Without mindfulness, flexibility alone may not reduce stress effectively. Gender findings further suggest that women experience greater stress levels, emphasizing the need for inclusive interventions. Combining mindfulness practices with cognitive flexibility strategies may offer a

more comprehensive approach to improving mental health and resilience in today's high-stress environments.

Conflict of Interest Statement

The authors declare that there is no conflict of interest regarding the publication of this paper.

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