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The Mediating Role of Perceived Social Support and Mindfulness in the Relationship Between Psychological Hardiness and Distress Tolerance Among Students

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A B S T R A C T

Objective: This study aims to explore the mediating roles of perceived social support and mindfulness in the relationship between psychological hardiness and distress tolerance among university students.

Methods and Materials: This correlational study used structural equation modeling to examine the relationships among psychological hardiness, distress tolerance, perceived social support, and mindfulness. A sample of 332 undergraduate and graduate students was selected through convenience sampling. Data were collected using validated questionnaires, including the Psychological Hardiness Inventory, Distress Tolerance Scale, Multidimensional Scale of Perceived Social Support, and Five Facet Mindfulness Questionnaire. Statistical analyses were conducted using SPSS and AMOS software, with Maximum Likelihood estimation employed for path analysis.

Findings: Path analysis revealed significant direct and indirect relationships between psychological hardiness and distress tolerance. Psychological hardiness demonstrated a strong total effect on distress tolerance ($\beta = 0.420$, $p < 0.001$), with significant direct effects mediated by mindfulness ($\beta = 0.324$, $p < 0.001$) and perceived social support ($\beta = 0.293$, $p < 0.001$). Mindfulness significantly influenced distress tolerance ($\beta = 0.273$, $p < 0.001$), while perceived social support exhibited the strongest direct effect on distress tolerance ($\beta = 0.418$, $p < 0.001$). Indirect pathways further highlighted the mediating roles of mindfulness and perceived social support in enhancing the relationship between hardiness and distress tolerance.

Conclusion: The findings underscore the importance of both internal resources, such as mindfulness, and external resources, such as perceived social support, in fostering distress tolerance among students. These results suggest that interventions aimed at enhancing psychological hardiness should incorporate strategies to strengthen mindfulness practices and social support networks to effectively improve students' emotional coping capacities.

Keywords: *Psychological Hardiness, Distress Tolerance, Mindfulness, Perceived Social Support, Structural Equation Modeling, University Students*

1. Introduction

Understanding the relationship between psychological hardiness, perceived social support, and mindfulness in fostering distress tolerance is a pivotal concern in contemporary psychological research. Distress tolerance, defined as the ability to endure and manage emotional or psychological discomfort, plays a vital role in determining mental health outcomes (Hernandez et al., 2020). Particularly among student populations, distress tolerance is influenced by various psychological and social factors that interact dynamically (Abdi Hamal Abad et al., 2023; Bakhshi et al., 2023; Barghi Irani & Dehghan Saber, 2021; Mahvash et al., 2024; Takhayori et al., 2021).

Psychological hardiness is a multifaceted construct encompassing a sense of control, commitment, and challenge in the face of stress (Alsukah et al., 2020). It serves as a resilience factor that buffers individuals against the adverse effects of stress and promotes adaptive coping mechanisms. Evidence suggests that individuals with higher psychological hardiness exhibit greater tolerance for emotional discomfort and reduced vulnerability to psychological distress (Babaeiamiri, 2016; Besharat et al., 2008). In the academic context, psychological hardiness enables students to navigate the demands of their educational environment, fostering better mental health and academic performance (Shahidi et al., 2023; Shahidi et al., 2021).

Perceived social support, defined as the subjective sense of being cared for and valued by others, is another critical factor influencing distress tolerance (Habibi, 2023). Social support functions as a protective mechanism, mitigating the effects of stress and enhancing individuals' ability to endure challenging circumstances (Ebrahimi et al., 2019). The quality and availability of social support from family, friends, and peers significantly impact students' psychological well-being and their ability to manage distress effectively (Ashoori, 2016; Sohrabi, 2019). Studies have shown that perceived social support mediates the relationship between psychological hardiness and distress tolerance, underscoring its central role in fostering resilience in various populations (Hernandez et al., 2020; Takhayori et al., 2021).

Mindfulness, a psychological construct encompassing awareness, acceptance, and nonjudgmental attention to the present moment, has garnered significant attention in its relationship to distress tolerance (Seyed Ali Tabar & Zadhasn, 2023). While mindfulness is often studied as a therapeutic intervention, this study examines it as a dispositional quality that influences students' ability to endure distress. Mindfulness enhances emotional regulation and cognitive flexibility, enabling individuals to navigate stressful experiences with greater ease (Cano et al., 2020). Moreover, mindfulness has been identified as a critical factor in strengthening psychological hardiness and promoting the perception of social support, thereby contributing indirectly to distress tolerance (Farahbakhsh Beh et al., 2019; Mahvash et al., 2024).

The theoretical framework for this study integrates these constructs to examine their collective influence on distress tolerance. Building on existing research, the study posits that psychological hardiness and mindfulness directly impact distress tolerance, while perceived social support mediates these relationships. Empirical evidence highlights the interdependence of these factors in various contexts. For instance, Shahidi et al. (2021) demonstrated that interventions enhancing psychological hardiness and social support significantly improved distress tolerance in patients with chronic conditions (Shahidi et al., 2021). Similarly, Taghipour et al. (2020) found that cognitive-behavioral strategies targeting psychological hardiness increased individuals' capacity to manage distress, mediated by improved social support (Taghipour et al., 2020).

Students represent a unique population for exploring these dynamics due to their susceptibility to academic and social stressors. Psychological hardiness has been shown to predict better mental health outcomes and academic achievement among students, emphasizing its importance as a protective factor (Abdi Hamal Abad et al., 2023; Barghi Irani & Dehghan Saber, 2021). Additionally, perceived social support from family, friends, and educational institutions plays a pivotal role in fostering resilience and coping in student populations (Hatamipour et al., 2017; Jalili & Mahmoodi, 2021). The mediating role of perceived social support in enhancing distress tolerance highlights its potential as an intervention target for improving student well-being (Habibi, 2023; Zanganeh Parsa & Hobi, 2021).

This study also draws on insights from broader research on psychological hardiness and distress tolerance in clinical and non-clinical populations. For example, Abbasi (2023) highlighted the effectiveness of mindfulness integrated with spiritual therapy in enhancing psychological hardiness and distress tolerance among mothers of children with hearing impairments (Abbasi, 2023). Similarly, Bakhshi et al. (2023) demonstrated that spiritual therapy significantly improved psychological hardiness and reduced psychological distress in students. These findings underscore the adaptability of

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psychological hardiness as a construct and its relevance across diverse populations (Bakhshi et al., 2023).

Despite extensive research on psychological hardiness, distress tolerance, and their associated factors, there remains a gap in understanding the integrated effects of social support and mindfulness on these constructs. Existing studies have largely examined these factors in isolation, overlooking their potential interplay and combined impact. This study aims to address this gap by exploring the mediating role of perceived social support and mindfulness in the relationship between psychological hardiness and distress tolerance among students.

2. Methods and Materials

2.1. Study Design and Participants

This study is applied in nature, theoretical in purpose, and descriptive in method, specifically correlational with a structural equation modeling approach. In correlational methods, the relationship between two variables is examined to understand how one variable (independent) influences changes in another variable (dependent). If an increase in the independent variable corresponds with an increase in the dependent variable, a positive correlation is indicated. Conversely, if an increase in the independent variable leads to a decrease in the dependent variable, a negative correlation exists. Structural equation modeling (SEM) is an advanced extension of correlation analysis, examining not only direct relationships but also indirect effects among multiple variables. This study investigates both direct and indirect relationships among psychological resilience (exogenous variable), distress tolerance (endogenous variable), and the mediating variables of perceived social support and mindfulness.

The statistical population of this study consists of undergraduate and graduate students from Payame Noor, non-profit, and Azad universities in the Noor city district during the academic year 2023-2024. To estimate the sample size, we used Kline's (2015) recommended model, which suggests a sample size at least five times and no more than twenty times the number of indicators (measurable variables or subscales). With fifteen variables in this study, a sample size of 300 was determined to be sufficient. However, to account for potential incomplete questionnaires, 332 participants were selected using convenience sampling.

Inclusion criteria for the sample included being an undergraduate or graduate student and providing informed consent, while exclusion criteria involved withdrawal from the study, incomplete questionnaire responses, or severe psychological disorders.

2.2. Measures

2.2.1. Distress Tolerance

The Distress Tolerance Scale (DTS), developed by Simons and Gaher (2005), is a 15-item scale measuring four subscales: tolerance, appraisal, absorption, and regulation. Items are rated on a Likert scale from 1 (strongly agree) to 5 (strongly disagree), with item 6 scored in reverse. Higher scores indicate greater distress tolerance. This scale has demonstrated good reliability with a Cronbach's alpha of 82%. Significant negative correlations were found between DTS and negative affectivity (-59%), alcohol use (-23%), and marijuana use (-20%), with positive correlations to positive affectivity (26%) (Barghi Irani & Dehghan Saber, 2021).

2.2.2. Psychological Hardiness

The Psychological Hardiness Inventory (AHI) by Kiarmathi (1998) consists of 27 items measuring psychological hardiness. Respondents rate items on a scale from "never" to "often." Higher scores reflect greater psychological hardiness. In Kiarmathi's research, Cronbach's alpha was 76%, and the inventory showed significant correlations with measures of self-actualization, anxiety, and depression (Abdi Hamal Abad et al., 2023; Seyed Ali Tabar & Zadhasn, 2023).

2.2.3. Perceived Social Support

The Perceived Social Support Scale (PSSS), developed by Zimet et al. (1988), is a 12-item instrument that assesses social support from family, community, and friends. Items are rated on a 7-point Likert scale, with higher scores indicating greater perceived social support. Psychometric properties of this scale have been validated in various international studies (e.g., Stanley et al., 1998). In Iranian samples, Cronbach's alpha for the overall scale was 91%, and test-retest reliability coefficients were also high (Ashoori, 2016; Mahvash et al., 2024).

2.2.4. Mindfulness

The Mindfulness Questionnaire (FFMQ) by Baer et al. (2006) is a self-report instrument consisting of 39 items assessing five dimensions of mindfulness: observing,

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describing, acting with awareness, non-judging, and non-reactivity. Cronbach's alpha for the total mindfulness score was reported as 90%. Construct validity and test-retest reliability have been established in multiple studies, with high internal consistency (Abbasi, 2023; Mahvash et al., 2024).

2.3. Data Analysis

For data analysis, both descriptive and inferential statistics were used. Descriptive statistics, such as means, standard deviations, variance, and graphical representations, were employed to summarize the data. The normality of the data was tested using SPSS software. To analyze the relationships among the variables, Structural Equation Modeling (SEM) was employed using AMOS 26.0, with Maximum Likelihood (ML) estimation to assess the model fit and test hypotheses.

3. Findings and Results

In terms of demographic characteristics, 129 participants (38.9%) were under 21 years of age, 69 participants (20.8%) were between 22 and 24 years, 52 participants (15.6%) were between 25 and 27 years, and 82 participants (24.7%) were over 27 years old. The mean age of the participants was 24.06 years, with a standard deviation of 5.13 years. Regarding gender distribution, 145 participants (43.7%) were male, while 187 participants (56.3%) were female. In terms of academic level, 234 participants (70.5%) were undergraduate students, and 98 participants (29.5%) were pursuing their master's degrees.

Table 1 presents the mean, standard deviation, and Cronbach's alpha coefficients for the variables studied. As shown in the table, the mean score for psychological hardiness was 35.43 (SD = 6.78), with a high reliability coefficient of 0.89. The components of mindfulness (observation, description, acting with awareness, non-judging, and non-reactivity) demonstrated varying levels of mean scores, with observation showing the highest mean (23.09, SD = 4.53) and non-reactivity having the lowest mean (19.57, SD = 3.46). The Cronbach's alpha values for these components ranged from 0.69 to 0.78, indicating acceptable to good internal consistency. Perceived social support from family, friends, and others also showed strong reliability with alpha values between 0.80 and 0.84. Finally, the distress tolerance components, including tolerance, absorption, evaluation, and regulation, showed acceptable internal consistency with alpha values ranging from 0.58 to 0.73.

Table 1

Mean, Standard Deviation, and Cronbach's Alpha Coefficients for Research Variables

Variable	Mean	Standard Deviation	Cronbach's Alpha
Psychological Hardiness	35.43	6.78	0.89
Mindfulness - Observation	23.09	4.53	0.76
Mindfulness - Description	24.27	4.21	0.72
Mindfulness - Acting with Awareness	23.51	4.93	0.69
Mindfulness - Non-Judging	22.90	5.10	0.78
Mindfulness - Non-Reactivity	19.57	3.46	0.75
Perceived Social Support - Family	19.18	4.24	0.80
Perceived Social Support - Friends	18.76	4.32	0.84
Perceived Social Support - Others	17.32	4.50	0.81
Distress Tolerance - Tolerance	8.87	2.06	0.58
Distress Tolerance - Absorption	8.58	2.21	0.66
Distress Tolerance - Evaluation	17.25	3.59	0.73
Distress Tolerance - Regulation	8.40	2.39	0.64

It should be noted that the Cronbach's alpha coefficients for the distress tolerance components were somewhat lower, particularly for tolerance, suggesting that caution should be exercised when interpreting the findings related to this component.

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Table 2 displays the correlation coefficients between the research variables. As seen in the table, most correlations are in the expected direction and align with theoretical expectations. For example, psychological hardiness showed significant positive correlations with several components of mindfulness, including acting with awareness ($r = 0.16$, $p < 0.01$), non-judging ($r = 0.23$, $p < 0.01$), and non-reactivity ($r = 0.26$, $p < 0.01$). Perceived social support was positively correlated with psychological hardiness and several mindfulness components, especially family support with psychological hardiness ($r = 0.20$, $p < 0.01$), friend support with mindfulness - description ($r = 0.17$, $p < 0.05$), and others' support with mindfulness - observation ($r = 0.21$, $p < 0.01$). Distress tolerance was also positively correlated with psychological hardiness, particularly with the tolerance component ($r = 0.32$, $p < 0.01$).

Table 2

Correlation Matrix Between Research Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Psychological Hardiness	-												
2. Mindfulness - Observation	0.16**	-											
3. Mindfulness - Description	0.29**	0.36**	-										
4. Mindfulness - Acting with Awareness	0.16**	0.44**	0.50**	-									
5. Mindfulness - Non-Judging	0.23**	0.38**	0.52**	0.57**	-								
6. Mindfulness - Non-Reactivity	0.26**	0.28**	0.31**	0.30**	0.32**	-							
7. Social Support - Family	0.20**	0.10	0.23**	0.17*	0.13*	0.23**	-						
8. Social Support - Friends	0.17**	0.06	0.17**	0.18**	0.09	0.05	0.37**	-					
9. Social Support - Others	0.21**	0.14*	0.25**	0.20**	0.24**	0.06	0.47**	0.45**	-				
10. Distress Tolerance - Tolerance	0.32**	0.06	0.29**	0.21**	0.22**	0.10	0.19**	0.29**	0.28**	-			
11. Distress Tolerance - Absorption	0.27**	0.08	0.28**	0.19**	0.19**	0.06	0.21**	0.27**	0.25**	0.34**	-		
12. Distress Tolerance - Evaluation	0.26**	0.14*	0.31**	0.22**	0.26**	0.14*	0.19**	0.25**	0.30**	0.46**	0.48**	-	
13. Distress Tolerance - Regulation	0.17**	0.07	0.18**	0.14*	0.17**	0.19**	0.15**	0.17**	0.21**	0.30**	0.23**	0.34**	-

**p < 0.01, *p < 0.05

As shown in Table 2, the correlations between the variables are generally positive, supporting the theoretical assumptions of the study. Specifically, psychological hardiness showed consistent positive relationships with mindfulness components and perceived social support, further reinforcing the interconnections between these constructs. Similarly, the distress tolerance dimensions were positively correlated with psychological hardiness, suggesting that individuals with higher levels of psychological hardiness tend to report better distress

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tolerance. These results provide strong empirical support for the study's hypotheses and are in line with existing literature in the field.

The assumptions of normality, multicollinearity, and linearity were examined and reported as follows:

The skewness and kurtosis values were analyzed to check the distribution of each variable. The values of skewness and kurtosis were within an acceptable range for most variables, suggesting that the data distribution is relatively normal. For example, the variable "Psychological Hardiness" showed a skewness value of 0.27 and kurtosis of -0.29, indicating a slightly normal distribution. Similarly, "Mindfulness - Observation" exhibited skewness of 0.06 and kurtosis of -0.43, reflecting a moderately normal distribution. However, variables such as "Mindfulness - Act with Awareness" showed negative skewness (-0.39) and kurtosis (-0.53), suggesting a slight departure from normality. While minor deviations from normality were observed, they do not appear severe enough to substantially affect the validity of statistical analyses.

The Variance Inflation Factor (VIF) and Tolerance statistics were reviewed to evaluate the presence of multicollinearity among the predictor variables. All VIF values were below the threshold of 10, with the highest VIF recorded for "Mindfulness - Act with Awareness" at 1.76. The lowest VIF values were found in "Mindfulness - Description" (1.63) and "Perceived Social Support - Support from Others" (1.52). These results indicate that multicollinearity is not a significant concern, and the predictor variables do not exhibit excessive correlation with one another.

The assumption of linearity was examined through the analysis of scatter plots, which were found to demonstrate an approximately linear relationship between the dependent and independent variables. The scatter plots suggested that there are no major violations of linearity, as the relationships between the variables are predominantly linear.

These assumptions were tested to ensure the validity of the subsequent statistical analyses, and the results indicated that the assumptions of normality, multicollinearity, and linearity were met to a satisfactory extent.

Table 3 presents the factor loadings, standardized coefficients (β), standard errors (SE), and critical ratios (t) for the measurement model in the confirmatory factor analysis.

Table 3

Measurement Model Parameters in Confirmatory Factor Analysis

Variable Indicator	b	β	SE	t
Mindfulness - Observation	1	0.539		
Mindfulness - Description	1.208	0.670	0.143	8.44
Mindfulness - Act with Awareness	1.508	0.746	0.174	8.68
Mindfulness - Non-Judgment	1.545	0.739	0.179	8.66
Mindfulness - Non-Reactivity	1.606	0.427	0.099	6.12
Social Support - Family Support	1	0.609		
Social Support - Friend Support	1.010	0.610	0.128	7.86
Social Support - Other Support	1.315	0.763	0.160	8.20
Distress Tolerance - Tolerance	1	0.619		
Distress Tolerance - Engagement	1.050	0.606	0.129	8.13
Distress Tolerance - Evaluation	1.122	0.754	0.238	8.91
Distress Tolerance - Regulation	1.839	0.446	0.130	6.46

Note: The unstandardized factor loadings for the observed indicators of "Observation," "Family Support," and "Tolerance" were fixed at 1, so their standard errors and critical ratios are not computed.

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Table 3 shows that all the factor loadings for the observed indicators were statistically significant, with critical ratios (t-values) exceeding the threshold of 1.96 ($p < 0.01$). For example, the factor loading for "Mindfulness - Observation" is 0.539, which is significant. Similarly, the factor loadings for "Mindfulness - Description" (0.670), "Mindfulness - Act with Awareness" (0.746), and "Mindfulness - Non-Judgment" (0.739) also demonstrate strong relationships with their respective latent constructs. For perceived social support, the factor loading for "Family Support" was fixed at 1, while "Friend Support" (0.610) and "Other Support" (0.763) also exhibited substantial loadings. The distress tolerance indicators, such as "Tolerance" (0.619) and "Engagement" (0.606), also showed significant loadings, indicating their importance in the model. These results support the robustness of the measurement model, confirming that the observed indicators reliably measure their corresponding constructs.

Table 4 presents the path coefficients for the structural model, showing the direct, indirect, and total effects between the variables in the study.

Table 4

Path Coefficients, Direct and Indirect Effects Between Research Variables in the Structural Model

Path	b	SE	β	p
Psychological Hardiness → Mindfulness	0.117	0.023	0.324	0.001
Psychological Hardiness → Social Support	0.114	0.028	0.293	0.001
Mindfulness → Distress Tolerance	0.144	0.042	0.273	0.001
Social Support → Distress Tolerance	0.204	0.048	0.418	0.001
Direct Path from Psychological Hardiness → Distress Tolerance	0.040	0.014	0.209	0.005
Indirect Path from Psychological Hardiness → Distress Tolerance	0.079	0.018	0.211	0.001
Total Path from Psychological Hardiness → Distress Tolerance	0.119	0.026	0.420	0.001

Table 4 presents the path coefficients for the structural model. The results indicate that all the direct paths are statistically significant at the $p < 0.01$ level. Specifically, the path from "Mindfulness" to "Psychological Hardiness" ($\beta = 0.324$, $p < 0.01$) and the path from "Social Support" to "Psychological Hardiness" ($\beta = 0.293$, $p < 0.01$) are both significant. These findings suggest that both mindfulness and social support have a significant positive impact on psychological hardiness.

Furthermore, the path from "Mindfulness" to "Distress Tolerance" ($\beta = 0.273$, $p < 0.01$) and the path from "Social Support" to "Distress Tolerance" ($\beta = 0.418$, $p < 0.01$) were also significant. The strong coefficient for "Social Support" highlights its substantial role in enhancing distress tolerance.

The direct path from "Psychological Hardiness" to "Distress Tolerance" ($\beta = 0.209$, $p < 0.01$) was significant, as was the indirect path ($\beta = 0.211$, $p < 0.01$). The total path from "Psychological Hardiness" to "Distress Tolerance" ($\beta = 0.420$, $p < 0.01$) further supports the interrelationships among these constructs, confirming that psychological hardiness contributes directly and indirectly to distress tolerance.

These findings demonstrate that mindfulness, social support, and psychological hardiness all play significant roles in shaping distress tolerance, and the proposed structural model is robust in explaining these relationships.

The fit indices for the structural model indicate a good fit between the model and the data. The chi-square value for the model is 66.89 with 61 degrees of freedom, yielding a chi-square to degrees of freedom ratio (df/χ^2) of 1.47. This ratio is within the acceptable range, suggesting a good model fit.

The Goodness of Fit Index (GFI) is 0.961, which is considered excellent, indicating that the model explains a large proportion of the variance in the data. Similarly, the Adjusted Goodness of Fit Index (AGFI) is 0.943, further supporting the model's adequacy.

The Comparative Fit Index (CFI) is 0.970, which is also a strong indication of a good fit, as values above 0.90 are generally considered acceptable.

Finally, the Root Mean Square Error of Approximation (RMSEA) is 0.038, which is well below the threshold of 0.08, indicating a close fit between the model and the observed data.

Overall, these fit indices suggest that the structural model provides an excellent representation of the relationships among the variables in the study.

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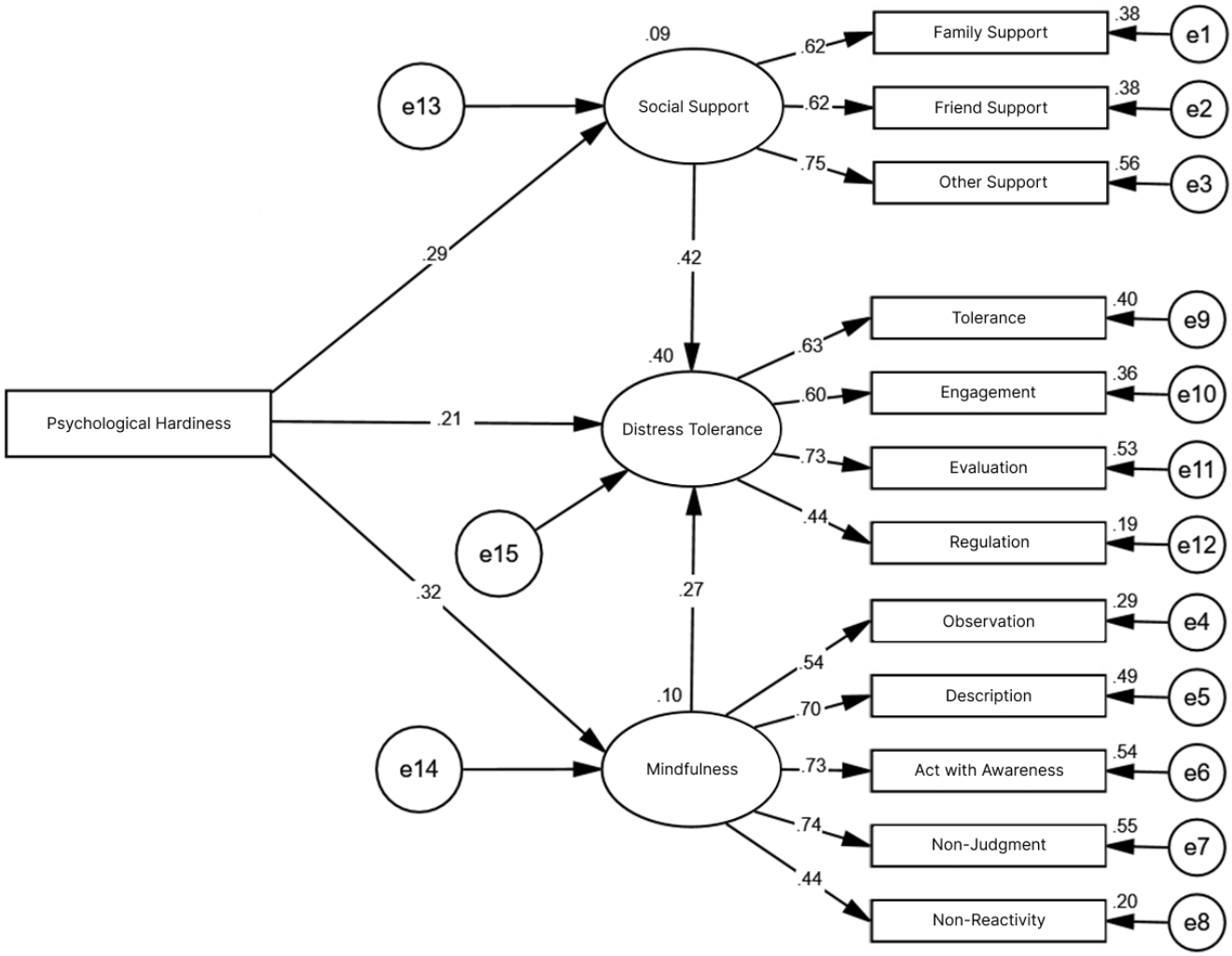
Figure 1

Final Model of The Study



4. Discussion and Conclusion

The present study investigated the mediating role of perceived social support and mindfulness in the relationship between psychological hardiness and distress tolerance among students. The findings revealed significant direct and indirect effects, underscoring the interconnectedness of these constructs. Psychological hardiness demonstrated a direct positive impact on distress tolerance, while perceived social support and mindfulness both mediated this relationship, amplifying its effects. These results align with prior research and contribute to a deeper understanding of how these factors interact to influence students' capacity to manage distress.

The finding that psychological hardiness positively predicts distress tolerance aligns with previous studies highlighting the role of hardiness in fostering resilience against stress and adversity (Besharat et al., 2008). Hardiness encompasses a sense of control, commitment, and perception of challenges as opportunities for growth, which collectively enhance individuals' ability to tolerate distress. In this study, students with higher psychological hardiness were better equipped to endure and manage emotional discomfort, supporting the construct's significance in academic contexts (Abdi Hamal Abad et al., 2023).

Perceived social support emerged as a significant mediator, bridging the relationship between psychological hardiness and distress tolerance. This finding is consistent with research emphasizing the protective effects of social support on mental health and coping capacities (Ebrahimi et al., 2019; Hernandez et al., 2020). Social support from family, friends, and peers provides a buffer against stress,

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fostering emotional stability and enhancing individuals' ability to tolerate distress (Ashoori, 2016; Sohrabi, 2019). The mediating role of perceived social support aligns with studies indicating its centrality in resilience frameworks, particularly in student populations where peer and familial support play critical roles (Habibi, 2023; Hatamipour et al., 2017).

Mindfulness also played a significant mediating role in the relationship between psychological hardiness and distress tolerance. This result corroborates evidence from prior studies demonstrating the impact of mindfulness on emotional regulation and distress management (Cano et al., 2020; Seyed Ali Tabar & Zadhasn, 2023). Mindfulness enhances awareness and acceptance of present-moment experiences, reducing emotional reactivity and improving distress tolerance (Barghi Irani & Dehghan Saber, 2021; Mahvash et al., 2024). By fostering a balanced perspective and reducing over-identification with negative thoughts, mindfulness strengthens psychological hardiness and facilitates adaptive responses to stress (Abbasi, 2023; Shahidi et al., 2023; Shahidi et al., 2021).

The indirect pathways further underscore the dynamic interactions between these constructs. Students with higher psychological hardiness were more likely to perceive greater social support and demonstrate higher levels of mindfulness, which in turn enhanced their distress tolerance. These findings align with structural models from prior research, which highlight the interconnected roles of hardiness, social support, and mindfulness in promoting mental health and resilience (Farahbakhsh Beh et al., 2019; Takhayori et al., 2021).

The results of this study are consistent with findings from Abbasi (2023), who demonstrated the efficacy of integrating mindfulness and psychological hardiness in improving distress tolerance among mothers of children with hearing impairments (Abbasi, 2023). Similarly, Bakhshi et al. (2023) highlighted the effectiveness of interventions targeting spiritual and psychological hardiness in reducing psychological distress and enhancing tolerance in student populations (Bakhshi et al., 2023). These studies support the notion that psychological hardiness acts as a foundational resilience factor, strengthened by mindfulness and social support.

The mediating role of social support aligns with findings from Hernandez et al. (2020), who reported that perceived social support mitigates the impact of urban stress on psychological symptoms by enhancing distress tolerance (Hernandez et al., 2020). Likewise, Ebrahimi et al. (2019) observed that social support significantly predicted distress tolerance in elderly individuals with cardiovascular disease, further corroborating its protective role in diverse populations (Ebrahimi et al., 2019).

Mindfulness's mediating effect is supported by Cano et al. (2020), who found that mindfulness, along with emotion regulation and social support, moderates the relationship between depressive symptoms and resilience in emerging adults (Cano et al., 2020). Barghi Irani and Dehghan Saber (2021) similarly highlighted mindfulness as a key component in reducing irrational beliefs and anxiety, which are closely linked to distress tolerance. The consistency across these studies underscores the robustness of the findings and their relevance to psychological interventions (Barghi Irani & Dehghan Saber, 2021).

5. Limitations & Suggestions

Despite its contributions, this study has several limitations. The cross-sectional design restricts the ability to infer causality between psychological hardiness, social support, mindfulness, and distress tolerance. Longitudinal studies are needed to establish temporal relationships among these variables. Additionally, the sample was limited to university students, which may reduce the generalizability of the findings to other populations. Cultural factors may also influence the perception of social support and the practice of mindfulness, warranting caution in applying these findings universally. Finally, self-report measures were used, which could introduce response biases and limit the objectivity of the data.

Future research should adopt longitudinal designs to explore the causal pathways between psychological hardiness, perceived social support, mindfulness, and distress tolerance. Expanding the sample to include diverse populations, such as individuals from different cultural, age, and occupational groups, would enhance the generalizability of the findings. Investigating potential moderators, such as personality traits or socio-economic status, could provide a more nuanced understanding of how these constructs interact. Additionally, exploring the effectiveness of interventions designed to enhance psychological hardiness, social support, and mindfulness in various contexts could offer valuable insights into their practical applications. Finally, incorporating objective measures, such as physiological markers of stress, alongside self-reports could strengthen the validity of future studies.

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The findings of this study have several practical implications. Educational institutions should consider implementing programs that enhance psychological hardiness and mindfulness among students. Workshops focused on skill-building for resilience and emotional regulation could foster hardiness, while mindfulness-based practices could be integrated into the curriculum to promote adaptive coping strategies. Institutions should also prioritize fostering a supportive environment by encouraging peer mentorship and strengthening familial involvement in students' academic lives. Mental health professionals could develop targeted interventions combining mindfulness, social support enhancement, and hardiness training to improve distress tolerance in vulnerable populations. Finally, public health campaigns emphasizing the importance of social connections and community support could help build resilience at a societal level.

Acknowledgments

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

This article is derived from the first author's doctoral dissertation. All authors equally contributed to this article.

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