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Prediction of Post-Traumatic Stress Disorder Symptom Severity Based on Perceived Social Support, Coping Styles, and Spiritual Well-Being in Survivors of a Fire Incident

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Abstract

Background: *Post-traumatic stress disorder (PTSD) is one of the most debilitating psychiatric conditions, exerting long-lasting effects on mental health following severe traumatic events. This study aimed to examine the extent to which perceived social support, coping styles, and spiritual well-being predict PTSD symptom severity among university students who experienced psychological trauma during a fire incident in the course of the 2024 Arbaeen pilgrimage.*
Methods: *Employing a descriptive-correlational design, a convenience sample of 102 students from universities in Qom, Iran, was recruited. Participants completed the Spiritual Well-Being Scale, the Billings and Moos Coping Styles Questionnaire, the Multidimensional Scale of Perceived Social Support, and the PTSD Checklist. Data were analyzed using descriptive statistics, Pearson's correlation coefficients, and multiple regression analysis.*
Results: *Results showed that existential well-being, problem-focused coping, and perceived social support from friends were negatively and significantly associated with PTSD symptom severity, whereas somatization-focused coping was positively and significantly related to higher PTSD severity. The regression model incorporating these variables accounted for 67% of the variance in PTSD symptoms.*
Conclusions: *These findings highlight the crucial role of spiritual well-being and social support—particularly from friends—in preventing and reducing PTSD symptoms, and suggest that promoting adaptive coping strategies and strengthening supportive social networks may improve psychological outcomes among survivors of traumatic events.*

Keywords: Post-traumatic stress disorder, Perceived social support, Coping styles, Spiritual well-being, Fire incident, University students.
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Introduction

Post-traumatic stress disorder (PTSD) is one of the most prevalent and debilitating psychiatric disorders that develops following exposure to adverse events and severe trauma, leaving long-lasting effects on an individual's mental health [1,2]. The prevalence of this disorder among individuals who have experienced trauma has been reported to be approximately 24% (2). PTSD typically arises in response to highly stressful events such as violent crimes, natural disasters, or severe assaults, and is characterized by symptoms including intrusive recollections of the traumatic event, heightened arousal and vigilance, avoidance of trauma-related cues, and negative patterns of thought. These symptoms can lead to chronic impairment, comorbidity with other psychiatric disorders, and an increased risk of suicide [3, 4].

Among various types of trauma, PTSD in fire survivors is recognized as a major mental health concern and may persist for months after the incident [5, 6]. Evidence suggests that the severity and persistence of PTSD symptoms can be influenced by a range of psychological and social factors [5]. Numerous studies have emphasized that spiritual well-being, coping styles, and social support are among the most significant factors in predicting and moderating the severity of PTSD symptoms [5-9].

Perceived social support, as one of the key dimensions of mental health, refers to the resources and assistance that an individual perceives as available or receives from their social network [10, 11]. This support plays an effective protective role in reducing PTSD symptoms; significant inverse correlations between the level of social support and the severity of PTSD symptoms have been reported across various groups, including survivors of physical abuse and military personnel [1, 5, 9]. Systematic reviews and meta-analyses have also confirmed the importance of non-military social support in alleviating PTSD symptoms among military populations and veterans [9]. Furthermore, psychosocial support programs—such as peer groups, counseling, and spirituality enhancement workshops in academic settings—have been shown to improve mental health and reduce suicidal ideation [12, 13]. In addition, social support contributes to improved mental health and reduced stress symptoms by promoting positive coping styles[14, 15].

Coping styles are strategies that individuals use to manage psychological stress [16] and are generally categorized into three main types: problem-focused coping (efforts to solve or change the source of stress), emotion-focused coping (managing emotional reactions), and avoidant coping (avoiding confrontation with stress) [17]. The use of maladaptive coping styles such as avoidance, thought suppression, and self-blame has been associated with greater severity of PTSD symptoms [18-21], whereas problem-focused coping strategies and positive cognitive coping can have protective effects and reduce the severity of this disorder [4, 7, 11]. Evidence from a study on student volunteers during the COVID-19 pandemic indicates that the combination of social support with positive coping styles can enhance post-traumatic growth (PTG) and reduce PTSD symptoms [22].

Spiritual well-being, as an important dimension of mental health, plays a prominent role in coping with psychological stress resulting from trauma. According to Fisher's model (2010), spiritual well-being encompasses four domains: connection with self, others, environment, and the transcendent, with harmony among these domains leading to spiritual well-being [23]. This construct comprises two main components: religious and existential [24]. Research has shown that higher spiritual well-being is associated with a greater tendency to use positive coping strategies and social support, and it can reduce PTSD symptoms [7, 8, 25]. Conversely, spiritual conflicts and negative religious attitudes increase psychological distress and are linked to the severity of this disorder [5, 6, 16]. Moreover, spirituality can serve as a supportive resource in enhancing resilience and psychological well-being, particularly among youth and patients with chronic illnesses [25-27].

Despite extensive evidence regarding the role of these three variables, their simultaneous examination in predicting the severity of PTSD in Iran, especially among survivors of fire incidents, has not yet been conducted. Identifying these factors can provide valuable scientific and practical guidance for the prevention and intervention of this disorder [1, 7, 18, 9].

Based on this, the present study aims to examine the role of perceived social support, coping styles, and spiritual well-being in predicting the severity of PTSD symptoms among individuals who have experienced fire-related trauma.

Materials and Methods

The present study is descriptive-correlational in design. The statistical population consisted of university students from Qom who participated in the Arbaeen pilgrimage in 1403 (2024). During their stay in Karbala, the accommodation site of the students caught fire at a time when all of them were present in their residence. Therefore, all 135 students experienced the fire incident directly. The total number of students on this pilgrimage trip was 135. Based on Cochran's formula, considering a 95% confidence level and a 5% margin of error, the sample size was estimated to be 102. Convenience sampling was employed, meaning that students who met the inclusion criteria and were accessible participated in the study. Inclusion criteria comprised experiencing the fire incident at the accommodation site and being present at the location during the event. Exclusion criteria included incomplete questionnaire responses and withdrawal from continued participation in the study.

Data Collection Procedure: After obtaining the necessary permissions and explaining the purpose and nature of the study, informed consent was obtained from the participants. Data collection began three weeks after the fire incident and lasted for approximately ten days. The questionnaires were distributed to the participants as online files. The time required to complete the questionnaires was approximately 20 minutes, and responses were collected confidentially. After collection and review, the data were prepared for analysis.

Demographic Characteristics: All participants in the present study were female students from universities in Qom. Their level of education ranged from undergraduate (bachelors) to graduate (master's) studies. The age range of the participants was between 18 and 23 years.

The data were analyzed using SPSS software, version 21. In the descriptive statistics section, mean and standard deviation were calculated. To test the research hypotheses, Pearson correlation coefficient and multiple regression analysis were employed to examine relationships and predict the severity of PTSD symptoms. The significance level was set at 0.05 for all tests. Regression assumptions, including normality of error distribution and absence of multicollinearity, were also assessed.

Spiritual Well-Being Scale (SWBS): This questionnaire was developed by Paloutzian and Ellison (1982) and consists of 20 items assessing two dimensions: *Religious Spiritual Well-Being* and *Existential Spiritual Well-Being*. The first ten items measure religious spiritual well-being, while the remaining ten assess existential spiritual well-being. Responses are provided on a five-point Likert scale. The validity and reliability of this instrument have been confirmed in numerous studies [28].

Billings & Moos Coping Styles Questionnaire: The Billings & Moos Coping Styles Questionnaire was originally developed in 1981 by Billings and Moos to evaluate individuals' responses to stressful life events. The initial version contained 19 items, which was later revised to 32 items. The version used in the present study is the 32-item format, which includes five coping strategies: problem-focused coping, emotion-focused coping, cognitive appraisal-focused coping, somatization-focused coping, and seeking social support-focused coping. Responses are rated on a four-point Likert scale. The validity and reliability of this questionnaire have been reported and confirmed in various studies [29].

Multidimensional Scale of Perceived Social Support (MSPSS): This 12-item questionnaire measures perceived social support from three primary sources: family support (4 items), friends' support (4 items), and support from significant others (4 items). Responses are given on a five-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree." This instrument has demonstrated good validity and reliability, as confirmed in multiple studies [30].

PTSD Checklist (PCL-17): This 17-item questionnaire is based on DSM-IV criteria and assesses the severity of PTSD symptoms. Items are scored on a five-point Likert scale ranging from 1 (*Never*) to 5 (*Always*), with total scores ranging from 17 to 85. As there is no fixed cutoff score, results are reported in terms of means and standard deviations. This tool has also shown good validity and reliability in various studies [31].

All stages of the research were conducted in accordance with ethical guidelines. Informed consent was obtained from participants before the study commenced, and confidentiality of their information was ensured. Participation was voluntary, and participants had the right to withdraw from the study at any time.

Results

Table 1 presents the means, standard deviations, skewness, and kurtosis of the study variables.

Based on Table 1, the mean and standard deviation of the total scores were as follows: spiritual health (M=74.36, SD=±5.10), perceived social support (M=44.86, SD=±10.38),

and severity of post-traumatic stress symptoms (M=37.70, SD=±13.45). Additionally, the means and standard deviations for coping styles were: cognitive appraisal-focused coping (M=9.03, SD=±2.39), problem-focused coping (M=4.12, SD=±1.38), emotion-focused coping (M=15.15, SD=±3.38), somatization-focused coping (M=6.86, SD=±3.64), and social support-seeking coping (M=4.92, SD=±2.25). Furthermore, the distribution of the study variables was within acceptable limits, allowing for the use of parametric statistical methods in data analysis. Table 2 presents the correlation matrix among the study variables.

Table 1. Means, standard deviations, skewness, and kurtosis of the study variables

Variable	Component	Mean	SD	Skewness	Kurtosis
Spiritual health	Religious health	38.55	3.04	-0.36	0.60
	Existential health	35.81	3.23	0.61	0.84
	Total spiritual health score	74.36	5.10	0.40	0.75
Coping styles	Cognitive appraisal-focused coping	9.03	2.39	0.02	-0.04
	Problem-focused coping	4.12	1.38	0.84	1.63
	Emotion-focused coping	15.15	3.38	0.51	1.74
	Somatization-focused coping	6.86	3.64	1.25	1.18
	Social support-seeking coping	4.92	2.25	0.65	-0.04
Perceived social support	Family support	14.86	3.59	-1.29	1.35
	Friend support	14.75	3.95	-1.12	0.79
	Significant others support	15.25	3.35	-1.39	1.19
	Total perceived social support	44.86	10.38	-1.40	1.77
Post-traumatic stress	Re-experiencing	13.52	4.15	0.16	-0.28
	Avoidance/emotional numbing	13.57	6.14	1.26	1.27
	Arousal	10.61	4.87	0.64	-0.70
	Total PTSD symptoms score	37.70	13.45	0.91	0.32

Table 2. Correlation coefficients among study variables

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Religious health	1										
2. Existential health	0.32**	1									
3. Cognitive appraisal-focused coping	0.26**	0.27**	1								
4. Problem-focused coping	0.19	0.20*	0.41**	1							
5. Emotion-focused coping	0.04	-0.10	-0.05	0.02	1						
6. Somatization-focused coping	-0.14	-0.13	-0.25*	0.02	0.42**	1					
7. Social support-seeking coping	0.12	0.13	0.22*	0.14	0.28**	0.37**	1				
8. Perceived social support from family	0.22*	0.37**	0.33*	0.16	-0.25*	-0.53**	-0.02	1			
9. Perceived social support from friends	0.23*	0.33**	0.33**	0.08	-0.33**	-0.49**	-0.01	0.86**	1		
10. Perceived social support from significant others	0.23*	0.34**	0.26**	0.12	-0.23**	-0.49**	-0.01	0.89**	0.85**	1	
11. Post-traumatic stress symptoms	-0.30**	-0.41**	-0.29**	-0.22	0.33**	0.64**	0.21*	-0.67**	-0.68**	-0.66**	1

Note: *P-value<0.05, **P-value<0.01

Based on the findings presented in Table 2, there are significant negative correlations between post-traumatic stress symptoms and religious health (r=-0.30, P-value<0.01), existential health (r=-0.41, P-value<0.01), cognitive appraisal-focused coping (r=-0.29, P-value<0.01), problem-focused coping (r=-0.22, P-value<0.05), perceived social support from family (r=-0.67, P-value<0.01), perceived social support from friends (r=-0.68, P-value<0.01), and perceived social support from significant others (r=-0.66, P-value<0.01). Conversely, positive correlations were observed between post-traumatic stress symptoms and emotion-focused coping (r=0.33, P-value<0.01), somatization-focused coping (r=0.64, P-value<0.01), and social support-seeking coping (r=0.21, P-value<0.05).

Considering these correlation results and in order to examine the predictive role of spiritual health components, coping styles, and perceived social support on the severity of post-traumatic stress symptoms, multiple regression analysis was employed. Prior to conducting this analysis, the assumptions of the method were thoroughly tested.

According to Klein's (2023) recommendation for assessing the normality of data distribution, the absolute values of skewness and kurtosis for variables should not exceed 3 and 10, respectively [32]. Based on the results in Table 1, the normality assumption was confirmed. Additionally, the assumption of no multicollinearity was evaluated using tolerance indices and variance inflation factors (VIF). In this analysis, none of the calculated tolerance or VIF values for the study variables indicated any violation of the multicollinearity assumption. Finally, the independence of error terms was assessed using the Durbin-Watson test, where the calculated value (2.09) fell within the critical range (1.5–2.5), confirming this assumption as well. Therefore, the assessment of statistical assumptions demonstrated that the use of multiple regression analysis for the study data was appropriate. The results of these evaluations are presented in Table 3.

The results presented in Table 3 indicate that PTSD symptoms can be predicted based on the components of spiritual health, coping styles, and perceived social support (F=18.57, P-value<0.01). Together, these variables explained 67% of the variance in PTSD symptoms (R^2=0.67).

To further determine the contribution of each component—spiritual health, coping styles, and perceived social support—in predicting the severity of PTSD symptoms, beta coefficients, t-test values, and significance levels were calculated. The results are presented in Table 4.

Table 3. Summary of multiple regression model predicting PTSD symptoms based on spiritual health, coping styles, and perceived social support

Statistic	Correlation coefficient (R)	Coefficient of determination (R^2)	Sum of squares	Degrees of freedom (df)	Mean square	F-statistic	Significance level (P)
Regression	0.82	0.67	12260.29	10	1226.03	18.57	<0.001

Table 4. Significance of regression coefficients

Variable	B	Standard error	Beta	T	Significance level (p)
Constant	94.17	13.03		7.23	<0.001
Religious spiritual health	-0.38	0.29	-0.08	-1.29	0.199
Existential spiritual health	-0.75	0.27	-0.18	-2.63	0.010
Cognitive appraisal coping style	0.23	0.42	0.04	0.55	0.587
Problem-focused coping style	-1.64	0.67	-0.17	-2.45	0.016
Emotion-focused coping style	0.05	0.28	0.01	0.18	0.856
Somatization-focused coping style	1.30	0.31	0.35	4.12	<0.001
Support-seeking coping style	0.71	0.42	0.12	1.68	0.097
Perceived support from family	0.12	0.58	0.03	0.20	0.840
Perceived support from friends	-1.11	0.46	-0.32	-2.42	0.018
Perceived support from others	-0.58	0.57	-0.14	-1.03	0.307

The results of Table 4 indicate that the components of existential spiritual health (β=-0.18, P-value<0.05), problem-focused coping style (β=-0.17, P-value<0.05), and perceived support from friends (β=-0.32, P-value<0.05) negatively predict the severity of PTSD symptoms. Conversely, somatization-focused coping style (β=0.35, P-value<0.01) positively predicts the severity of PTSD symptoms. However, other components of spiritual health, coping styles, and perceived social support were not significant predictors of PTSD symptom severity.

Discussion

The present study aimed to examine the prediction of PTSD symptoms based on perceived social support, coping styles, and spiritual health among students who experienced a fire incident. The findings revealed that the predictive model incorporating these variables explained 67% of the variance in PTSD symptom severity, indicating the significant and meaningful role of these factors in predicting the intensity of this disorder.

The results showed that perceived social support, especially support from friends, was significantly associated with a reduction in the severity of PTSD symptoms. PTSD is one of the major psychological consequences resulting from exposure to traumatic events and is profoundly influenced by psychological, social, and spiritual factors. This finding confirms previous studies indicating that social support is a crucial protective resource that can reduce PTSD symptoms by enhancing resilience and alleviating the emotional burden caused by trauma [1, 9]. The role of social support from friends is particularly noteworthy in stressful situations, as this type of support is often associated with decreased feelings of loneliness and increased hopefulness [11]. Moreover, meta-analyses in military populations have shown that informal, non-military support—such as that from friends and family—exerts a stronger protective effect compared to formal military support [9].

Of course, our findings also showed that perceived support from family and other significant individuals had a significant negative correlation with the severity of PTSD symptoms; however, they were not significant predictors of PTSD symptom severity. This may be due to

the fact that all participants in the sample were undergraduate students, and given the nature of this age group, peers tend to play a more prominent role [33]. Additionally, since the sample consisted of students traveling together on the Arbaeen pilgrimage, they were alongside their friends at the time of the trauma and continued to exchange more support primarily with their friends afterward.

The findings also indicate that problem-focused coping style is negatively associated with the severity of PTSD symptoms and serves as a protective factor. Coping styles determine an individual's psychological and behavioral responses to stress and play a critical role in either the persistence or reduction of PTSD symptoms. These results align with previous studies that have linked the use of active and problem-focused coping strategies to a decrease in PTSD symptoms [20, 21, 26]. Employing this coping style enables individuals to better manage and control stressful situations, thereby preventing the entrapment in chronic PTSD symptoms.

In contrast, somatic-focused coping was associated with higher severity of PTSD symptoms. This coping style, which often involves physical and bodily reactions to stress, has also been linked in previous studies to increased severity of PTSD symptoms and other psychological disorders [18, 21]. This finding may indicate the inefficacy of this coping style in dealing with intense stress and trauma.

Emotion-focused coping and social support–seeking coping did not significantly predict PTSD severity. This finding may reflect the complex relationships between coping styles and their impact on PTSD symptoms. On the other hand, the results indicated that spiritual health, particularly its existential dimension, played a significant role in reducing PTSD symptom severity. This finding aligns with previous research identifying spiritual health as a crucial resource for coping with stress and enhancing psychological resilience [7, 8, 25, 23]. Spiritual health helps individuals find meaning and purpose in life, enabling greater resilience when facing crises. As a psychological and social dimension, spirituality plays a complex role in the experience of PTSD and the recovery process. Some studies have shown that spirituality can act as a protective factor in improving mental health and reducing PTSD symptoms, especially intrinsic spirituality, which involves the search for meaning and purpose in life and is positively related to resilience and life satisfaction [25, 26, 8, 34].

From a theoretical perspective, spiritual health, as part of psychological and existential well-being, plays a key role in the trauma adaptation process. The Spiritual Resilience Theory suggests that deep spiritual connections with oneself, others, and the world enable positive meaning-making of difficult experiences and strengthen internal coping resources [23, 24]. This spiritual connection allows individuals to perceive trauma as an opportunity for growth and positive change, a phenomenon known as PTG [22]. Therefore, spiritual health, by enhancing resilience and increasing the use of adaptive coping styles, contributes to the reduction of PTSD severity.

Additionally, as Fisher (2010) proposed, spiritual health encompasses individual, social, environmental, and transcendental dimensions, and the harmony and balance among these domains can lead to improved mental health and reduced PTSD symptoms [23]. However, the religious health component in this study did not significantly predict PTSD severity, which may be related to differences in how religious spirituality is experienced and interpreted among individuals. Furthermore, negative religious attitudes and spiritual struggles have been associated with greater PTSD symptom severity in some studies [7], highlighting the need for more detailed investigations into the role of religious culture and spirituality within the Iranian context.

One of the important aspects of this study is the simultaneous examination of three factors—perceived social support, coping styles, and spiritual health—which comprehensively demonstrates that these variables collectively can significantly influence the severity of PTSD symptoms. These findings can guide multidimensional therapeutic interventions that concurrently focus on strengthening social support, teaching effective coping strategies, and enhancing patients' spiritual health.

This study also showed that perceived social support, especially from friends, problem-focused coping style, and existential spiritual health act as protective and effective factors in reducing the severity of PTSD symptoms, whereas a coping style focused on somatization is associated with greater symptom severity. These results highlight the importance of considering psychological, social, and spiritual factors in the prevention and treatment of PTSD among individuals who have experienced severe traumas such as fire disasters.

The present study faced several limitations, including a limited sample size and sampling from students in a specific region, which restricts the generalizability of the findings. Additionally, the correlational nature of the study prevents causal inferences, and the data were based on self-reports, which may be subject to bias. Furthermore, some other influential variables such as anxiety, depression, and biological factors were not examined in this study.

It is recommended that future research employ more diverse samples and longitudinal designs, and also explore the roles of additional psychological and environmental factors. Moreover, the development and evaluation of interventions focused on enhancing spiritual health, social support, and effective coping styles for reducing PTSD symptoms are warranted.

Ethical Considerations

This study was reviewed and approved by the Research Ethics Committee of Qom University (Ethics Code: IR.QOM.REC.1404.009). All procedures involving human participants were conducted in accordance with the ethical standards of institutional and/or national research committees, as well as the 1964 Helsinki Declaration and its subsequent amendments. Informed consent was obtained from all participants, and the principles of voluntary participation, non-maleficence, and confidentiality were strictly observed throughout the study.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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