


The Mediating Role of Mindfulness in Explaining the Causal Relationship between Basic Psychological Needs and Family Functioning in Firefighters

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ABSTRACT

Objective: The occupational performance and effectiveness of firefighters are contingent on their mental health and adequate family functioning; hence, the purpose of this study was to investigate the mediating role of mindfulness in explaining the causal relationship between basic psychological needs and family functioning among firefighters.

Methods and Materials: The current study was applied in objective and correlational in method, using structural equation modeling. The research population included firefighters who were serving in the fire departments of the cities of Islamshahr, Baharestan, and Robot Karim during the winter of 2022 and spring of 2023, had been married for at least one year, and had a minimum of two years of experience in firefighting. Based on the opinion of Hoyle and Kramar (2004), the sample size was estimated to be 240, which was increased to 300 considering the probability of dropout. The sampling method was non-random, convenient, and voluntary. Measurement tools included the Family Assessment Device (FAD) (Epstein et al., 1980), the Basic Needs Satisfaction in General Scale (BNSG-S) (Gagne, Deci, & Ryan, 2000), and the Five Facet Mindfulness Questionnaire (FFMQ) (Baer, 2003). Data were analyzed using structural equation modeling.

Findings: The total path coefficient between basic psychological needs and family functioning ($\beta = -0.363$) and between mindfulness and family functioning ($\beta = -0.308$) were both negative and significant. The direct ($\beta = -0.256$) and indirect ($\beta = -0.107$) path coefficients between basic psychological needs and family functioning were also negative and significant.

Conclusion: The results indicated that mindfulness plays a significant mediating role in the causal relationship between family functioning and basic psychological needs.

Keywords: Firefighters, Mindfulness, Family Functioning, Basic Psychological Needs.

1. Introduction

The fire department is one of the crucial organizations in the country, where the efficiency and productivity of its personnel and human resources hold special importance. This significance stems from the fire department's responsibility to ensure and maintain the safety, lives, and properties of individuals in hazardous situations. The occupational performance and effectiveness of firefighters are inherently linked to their mental health and proper family functioning. Family functioning refers to the family's ability to coordinate or adapt to changes throughout life, resolve conflicts and disputes, maintain cohesion among members, respect boundaries between individuals, and implement the rules and principles governing it, aiming to protect the overall family system (Schuler et al., 2017). Indeed, family functioning is indicated by the level of cohesion, personal satisfaction, communication, and flexibility among family members (Whisman, 2019). Families with poor and inappropriate functioning experience numerous problems, especially in the emotional realm. In such families, adequate communication is often overlooked, and family members do not show affection and care for each other (Nocito et al., 2020); whereas, families with appropriate functioning have the necessary ability to solve problems and consider and implement solutions, have direct and impactful communication, pay attention to the needs of all family members and respond appropriately, thereby reducing the risk of separation and family tension (Pirzadeh & Parsakia, 2023).

One of the primary functions of the family is to satisfy the individual needs of family members (Scully et al., 2020; Sheikh Ahmadi et al., 2020). Fulfilling or failing to fulfill basic needs either enables the development and flourishing of individual talents or leads to physical and psychological disorders and conflicts (Abedin et al., 2022). Basic psychological needs are innate, and just as humans are born with the need for water and food, they are also born with the need for autonomy, competence, and connection. Effective communication is one of the crucial components of basic psychological needs, significantly impacting individual and family life, as well as occupational performance (Soleymani et al., 2023; Zhen et al., 2017).

In recent decades, psychologists have turned their attention to a concept known as mindfulness. Mindfulness is a type of cognitive therapy that enables the connection between mood, thoughts, feelings, and bodily sensations in the moment, reducing negative thoughts, depression, and

stress caused by family problems (Segal et al., 2018). Individuals with high mindfulness, due to their awareness of time and lack of fear of changes, can create a constantly dynamic and flexible environment in their lives (McRae & Gross, 2020). Studies have shown that mindfulness may directly and indirectly reduce depression, stress, and aggression, enhance psychological well-being, and consequently improve family functioning (Stevenson et al., 2019). Additionally, some research has demonstrated the effectiveness of training in emotion regulation and mindfulness on aggression and self-control (Mehraban et al., 2022); despite its relatively short history, mindfulness has shown positive and extensive effects in various areas, such as reducing psychological distress symptoms and enhancing quality of life, increasing spiritual, physical, psychological, and emotional well-being, and improving family health and communication patterns (Flugel Colle et al., 2010). Furthermore, mindfulness is effective in improving psychological well-being, reducing anxiety and anger, and enhancing quality of life, as it fosters the regulation of emotions without judgment and increases awareness of psychological and physical feelings, aiding in the clear perception and acceptance of emotions and physical phenomena as they occur (Brown & Ryan, 2003; Zare & Aghaziarati, 2018).

Given the above, it should be noted that the fire department deals with various incidents (accidents, floods, earthquakes, fires, etc.). Given the nature of this profession, it is expected that individuals working in the fire department possess a sense of competence (due to the responsibility of ensuring people's safety), autonomy, and appropriate emotional expression (due to high-stress situations and the need for quick decision-making in crisis conditions), as well as effective communication with the victims. Firefighters, due to their job responsibilities, face challenging and stressful situations and sometimes find themselves in scenarios where no specific instructions exist. They are compelled to make decisions based on general principles and collective benefits and accept the consequences of these decisions, making the recognition and management of emotions and control over oneself and the environment (psychological well-being) essential. Furthermore, the reciprocal impact of work conditions on the individual (especially firefighters in this study) and their performance in the family and other roles is undeniable. Firefighters, in addition to their social roles, also play the roles of spouses and possibly parents, thus playing a significant role in child-rearing and the mental health of family members. The

researcher's concern is how they balance and interact in two different environments (work and family) with awareness and understanding of needs, emotions, and psychological well-being for proper family functioning. Although various studies have been conducted on the role of each of the variables examined in this study on family functioning, this research aimed to investigate the mediating role of mindfulness in explaining the causal relationship between basic psychological needs and family functioning in firefighters.

2. Methods and Materials

2.1. Study Design and Participants

This study, aimed at application, falls under the category of applied research and follows the descriptive-correlational method, specifically utilizing structural equation modeling. The study population included firefighters who were actively serving in the fire departments of Islamshahr, Baharestan, and Robot Karim during the winter of 2022 and spring of 2023, who had been married for at least one year and had a minimum of two years of firefighting experience. Based on Hoyle and Kramar's (2004) suggestion, the sample size was estimated to be 240, which was increased to 300 to account for potential dropouts. The sampling method was non-random, convenient, and voluntary. Several fire department units were randomly selected, and from each unit, firefighters willing to participate (and meeting the research criteria) were chosen as the sample group.

2.2. Measures

2.2.1. Family Functioning

The Family Assessment Device (FAD), developed by Epstein et al. (1980), this scale aims to measure family functioning based on the McMaster model. The questionnaire comprises 60 items rated on a four-point scale from "strongly agree" (1) to "strongly disagree" (4) and includes seven subscales, measuring six family dimensions (problem-solving, roles, affective responsiveness, communication, affective involvement, behavior control) and one overall family functioning dimension. Higher scores indicate unhealthy functioning. The average score of items is calculated for each scale, and the scores of each subscale are summed and divided by the number of items. The validity and reliability of the FAD were tested by Epstein et al. (1983) on a sample of 503, showing an alpha range of 0.72 to 0.92, indicating relatively good internal consistency.

The FAD also effectively distinguished non-clinical and clinical family members across its seven subscales. The research findings were significant at the 0.001 level (Epstein et al., 1983). In Iran, Yousefi (2012) conducted a psychometric analysis of this questionnaire, reporting a Cronbach's alpha coefficient of 83% and explaining 20.36% of the total variance across 7 factors. The first factor explained 3.12%, the second 3.44%, the third 2.56%, the fourth 3.14%, the fifth 3.76%, the sixth 2.78%, and the seventh 2.56% of the total variance (Yousefi, 2012).

2.2.2. Basic Psychological Needs

The Basic Psychological Needs Satisfaction in General Scale (BNSG-S), measures the perceived support (satisfaction) of basic needs for autonomy, competence, and relatedness. It includes 21 questions rated on a seven-point Likert scale from "not true at all" (1) to "very true" (7), with reversed scoring for questions 3, 4, 7, 11, 15, 16, 18, 19, 20. Scores range from 20 to 42, indicating low satisfaction of basic psychological needs; scores between 42 and 105 indicate moderate satisfaction, and scores above 105 indicate high satisfaction (Deci & Ryan, 2000; Sheldon & Niemiec, 2006). In Iran, Besharat (2013) reported the Cronbach's alpha coefficient of this questionnaire between 0.83 and 0.91, and the validity analysis showed that the three factors could explain 53.6% of the total variance (Besharat, 2013).

2.2.3. Mindfulness

The Five Facet Mindfulness Questionnaire (FFMQ), a 39-item questionnaire with five subscales (observing, describing without labeling, acting with awareness, nonjudging of inner experience, and nonreactivity to inner experience), was developed by Baer (2003) through integrating items from the Freiburg Mindfulness Inventory, the Mindfulness Attention Awareness Scale (MAAS; Brown & Ryan, 2003), the Kentucky Inventory of Mindfulness Skills, and the FFMQ itself. It uses a five-point Likert scale from 1 ("never or very rarely") to 5 ("often or always"). The total score range for this scale is 39-195, with higher scores indicating greater mindfulness. Baer (2003) conducted an exploratory factor analysis on a sample of university students, finding suitable internal consistency for the factors, with Cronbach's alpha ranging between 0.75 to 0.91. The correlations among the factors were moderate and significant, ranging from 0.15 to 0.34 (Baer, 2003). In Iran, a study reported test-retest reliability coefficients for the FFMQ in the Iranian sample ranging from 0.55 to 0.83

(Heydarinasab et al., 2013). Research by Tamanaifar et al. (2019) also showed that the 5 components collectively explained 49.0% of the variance (Tamannaefifar et al., 2019).

2.3. Data analysis

After the completion and collection of the questionnaires, both descriptive and inferential statistics were utilized for data analysis. In the descriptive section, mean and standard deviation parameters were used. For inferential statistics, after ensuring the prerequisites for the use of parametric tests and path analysis were met, Pearson's correlation coefficient and path analysis were conducted using SPSS version 25 and AMOS version 21 software.

3. Findings and Results

In this study, 300 firefighters participated, with a mean age and standard deviation of 38.71 and 6.20 years, respectively, and a mean work experience and standard

deviation of 12.27 and 6.06 years, respectively. The educational level of the participants included 23 individuals (7.7%) with education below high school diploma, 176 (58.6%) with a high school diploma, 17 (5.7%) with an associate degree, and 84 (28%) with a bachelor's degree or higher. The mean age and standard deviation of the spouses were 34.07 and 6.03 years, respectively. The spouses' educational levels were as follows: 13 (4.3%) below high school diploma, 203 (67.7%) with high school diploma, 9 (3%) with associate degree, and 75 (25%) with bachelor's degree or higher. The mean and standard deviation of the duration of marriage were 12.92 and 5.67 years, respectively. Finally, 9 participants (3%) had no children, 90 (30%) had one child, 175 (58.3%) had two children, and 26 (8.7%) had more than two children. Table 1 shows the means, standard deviations, skewness, and kurtosis for the components of basic psychological needs, mindfulness, and family functioning.

Table 1

Descriptive Statistics

Variables	Mean	Standard Deviation	Skewness	Kurtosis
Basic Psychological Needs - Relatedness	28.91	7.35	-0.23	0.60
Basic Psychological Needs - Competence	24.87	6.07	-0.38	-0.09
Basic Psychological Needs - Autonomy	25.06	6.53	-0.21	-0.47
Mindfulness - Observing	24.30	5.78	-0.40	0.79
Mindfulness - Describing	24.66	5.52	-0.23	-0.52
Mindfulness - Acting with Awareness	25.89	6.68	0.12	-0.18
Mindfulness - Nonjudgment	27.02	7.42	-0.25	-0.61
Mindfulness - Nonreactivity	26.19	6.10	-0.54	-0.09
Family Functioning - Problem Solving	13.41	3.17	-0.38	0.82
Family Functioning - Communication	15.61	4.70	-0.19	-0.06
Family Functioning - Roles	22.79	5.82	-0.30	-0.91
Family Functioning - Affective Involvement	15.50	3.13	-0.26	-0.45
Family Functioning - Behavioral Control	23.78	5.40	-0.12	-0.57
Family Functioning - Overall Functioning	22.36	5.23	-0.47	-0.71

Based on the results in Table 1, skewness and kurtosis of the variables were examined to evaluate the normality of the univariate data distributions. The results indicated that the skewness and kurtosis indices for all components were within the ± 2 range, suggesting that the assumption of normality for univariate data distribution was met. The assumption of multicollinearity was examined using the Variance Inflation Factor (VIF) and Tolerance coefficient, this assumption was also met in the current study's data. The tolerance values for the predictor variables were greater than 0.1, and the VIF values for each were less than 10. Finally, to assess the normality of multivariate data distribution,

Mahalanobis distance was analyzed. The skewness and kurtosis values for Mahalanobis distance were 0.61 and 0.33, respectively, indicating that the assumption of multivariate normality was met.

After evaluating the assumptions, the fit of the structural model with the data was examined using structural equation modeling, AMOS 24.0 software, and Maximum Likelihood (ML) estimation. The structural model hypothesized that basic psychological needs and emotion regulation predict family functioning in firefighters both directly and indirectly through mindfulness mediation.

The results supported the acceptable fit of the structural model with the collected data ($\chi^2/df=2.23$, CFI = 0.928, GFI = 0.917, AGFI = 0.885, RMSEA = 0.064). The largest factor loading was for the nonreactivity indicator ($\beta = 0.792$) and the smallest for the relatedness indicator ($\beta = 0.469$). Since

the factor loadings of all indicators were greater than 0.32, it can be concluded that they all had the necessary capacity to measure the latent variables. Subsequently, Table 2 presents the path coefficients in the structural model.

Table 2

Direct, Indirect and Total Effects

Path	b	S.E.	β	p
Basic Psychological Needs → Mindfulness	0.248	0.082	0.349	0.001
Mindfulness → Family Functioning	-0.146	0.042	-0.308	0.001
Direct Path Coefficient: Basic Needs → Family Functioning	-0.102	0.037	-0.256	0.008
Indirect Path Coefficient: Basic Needs → Family Functioning	-0.036	0.011	-0.107	0.001
Total Path Coefficient: Basic Needs → Family Functioning	-0.138	0.028	-0.363	0.001

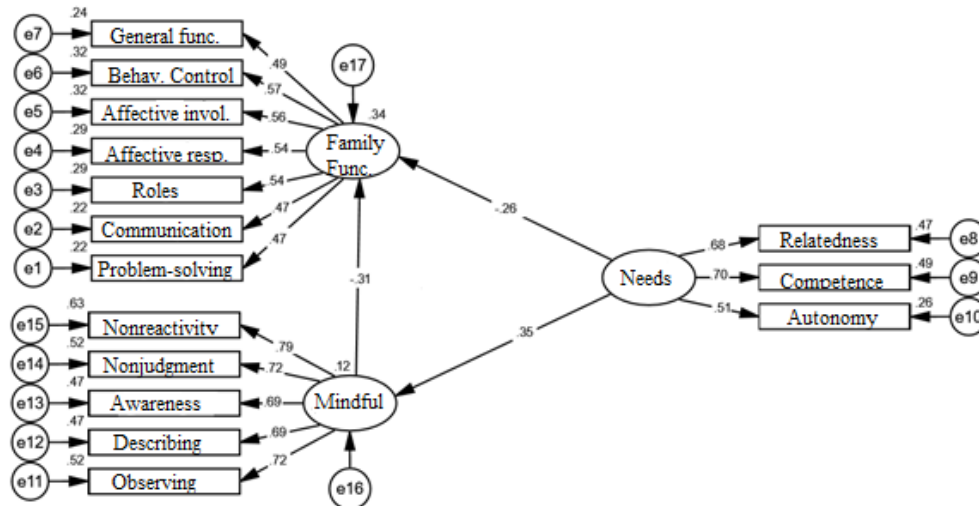
Table 2 shows that the total path coefficient between basic psychological needs and family functioning ($P = 0.001$, $\beta = -0.363$) on one hand, and the path coefficient between mindfulness and family functioning ($P = 0.001$, $\beta = -0.308$) on the other, were both negative and significant. The direct ($P = 0.008$, $\beta = -0.256$) and indirect ($P = 0.001$, $\beta = -0.107$) path coefficients between basic psychological needs and family functioning were also negative and significant. Based on this, it was concluded that mindfulness

significantly and negatively mediates the relationship between basic psychological needs and family functioning among firefighters. Figure 1 shows the structural model of the research using standardized data.

Additionally, the results indicated that the total squared multiple correlations (R^2) for the variable of family functioning was 0.34, meaning that basic psychological needs and mindfulness together explain 34% of the variance in family functioning among firefighters.

Figure 1

Final Model with Direct Effects



4. Discussion and Conclusion

The current study aimed to investigate the mediating role of mindfulness in explaining the causal relationship between basic psychological needs and family functioning in

firefighters. The results from the statistical analysis indicated that mindfulness significantly mediates the causal relationship between family functioning and basic psychological needs. These findings are consistent with the results of previous studies (Khan Mohammadi et al., 2018; Nocito et al., 2020).

In interpreting these findings, it can be said that the concept of mindfulness facilitates understanding and subsequent validation. Mindfulness includes: 1) observing or paying attention to another person's reactions, opinions, desires, feelings, suffering or joy, and facial expressions; 2) describing these behaviors and how they relate (descriptively, not interpretively) to one's own conditions and behaviors, describing the relationship between one's desires, feelings, conditions, and behaviors, and describing one's own reactions in the form of mindful listening; and 3) participating in an interaction (paying attention to the relationship between what one partner experiences or expresses and the other's reactions) (Li et al., 2019). Mindfulness involves several notable components: first, it is related to voluntary processes, meaning that attention is intentionally directed; second, in a state of mindfulness, the subject of attention, whatever it is, is consciously and presently occurring, thus encompassing a tendency towards the present moment. Third, an important component of mindfulness is the attitude of acceptance of what is currently being attended to, regardless of its emotional, motivational, and cognitive significance. In mindfulness, experience is examined with an attitude of openness and curiosity (Neufeld et al., 2020). On the other hand, some experts have proposed the functioning of the family along five dimensions: 1. Duty performance; 2. Role performance; 3. Communication (including emotional expression); 4. Emotional involvement; 5. Control (Pirzadeh & Parsakia, 2023). The family's success in each of these basic, developmental, and crisis duties leads to desirable functioning and relative tranquility in the family. However, failure in any of these duties leads to confusion and destruction in the family. Family life is a type of social life based on cooperation, solidarity, and collaboration among members. Just as humans cannot meet their biological and psychological needs without helping each other in social life, family members also need each other's help to meet their needs (Scully et al., 2020). Humans are motivated either by intrinsic or extrinsic motivation. Intrinsic motivation refers to performing an action due to internal pleasure or interest, and extrinsic motivation refers to performing an action due to external consequences. According to this perspective, intrinsic motivation is created by satisfying three fundamental psychological needs: autonomy, competence, and relatedness (Deci & Ryan, 2000). Deci and Ryan (2000) believe that basic psychological needs (the need for autonomy, competence, and relatedness) are innate, universal, and essential for individual and social

development and influence various adaptive behaviors (Deci & Ryan, 2000). Autonomy means that an individual determines their behavior. Competence refers to understanding how to achieve desired outcomes and having self-efficacy in performing necessary activities in a specific area. The need for relatedness refers to feeling valued and supported. Filak and Nicolini (2018) and Vansteenkiste et al. (2018) have also suggested that generally, research shows that satisfying basic psychological needs is associated with improved health status. Failure to meet the basic needs of the family leads to adverse effects. Unhealthy satisfaction of needs is a sign of the family's inability to perform basic duties (Filak & Nicolini, 2018; Vansteenkiste et al., 2018). Similarly, inability in performing developmental duties leads to emotional and psychological problems in the family. Many personality, mood, and behavioral disorders have their roots in neglecting developmental duties (Pan & Yang, 2023). All humans need love, affection, and attention from others, and to develop human virtues in themselves, they must also show love to others. As Abraham Maslow mentions in his hierarchy of needs, loving and being loved is a psychological need, meaning that just as a person benefits others with their affection and attention, they also want to benefit from the affections and expressions of love from others. This expression of love, especially from family members, is of special importance to them. If the family cannot satisfy this need of its members, they may suffer from psychological and emotional disorders (Feinberg et al., 2022).

5. Limitations & Suggestions

The current study faced limitations, including limited access to the statistical population, reliance on self-report tools, and insufficient cooperation from participants in the study. Therefore, caution must be exercised in generalizing the findings. Given the results and limitations of the study, it is recommended that similar research be conducted considering other variables, especially for the development of quantitative models. It is also suggested that these findings be utilized in developing therapeutic protocols and techniques in counseling and psychotherapy.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethics 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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None.

Authors' Contributions

M. Mahdavi, S. Rezakhani, and P. Jahangir jointly conceived the research idea, designed the study, and collected the data. S. Rezakhani performed the data analysis and interpretation. M. Mahdavi, S. Rezakhani, and P. Jahangir contributed equally to the manuscript's preparation, writing, and revision. All authors reviewed and approved the final version of the manuscript for submission.

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