JOURNAL OF
PSYCHIATRIC NURSING

DOI: 10.14744/phd.2022.46034
J Psychiatric Nurs 2023;14(2):112-119

Original Article

The moderating role of resilience in the relationship between symptoms of post-traumatic stress disorder and suicide ideation among firefighters in Türkiye

Yücel Şavklı, Filiz Şükrü Gürbüz

İstanbul Gelisim University, Institute of Graduate Studies, Department of Psychology, Science of Clinical Psychology, İstanbul, Türkiye

Abstract

Objectives: Given that firefighters are exposed to dangerous and emotionally intense situations, along with the threat of injury or death during their job, they are more likely to experience not only post-traumatic stress disorder (PTSD) symptoms but also the risk of suicide ideation. This study aims to analyze the moderating role of resilience in the relationship between PTSD symptoms and suicide ideation.

Methods: The purposeful sample in this cross-sectional and correlational study consisted of 316 firefighters. The data were collected with the demographic form, Brief Resilience Scale, Traumatic Stress Symptoms Scale, and the Scale for Suicide Ideation. To analyze the data, a moderator analysis was employed using the SPSS process macro (Model II).

Results: It was concluded that traumatic stress symptoms experienced at elevated levels were related to an increase in suicide ideation ($p<0.05$). Resilience was not directly effective on suicide ideation ($p>0.05$). The relationship between traumatic stress symptoms and suicide ideation was significant at low resilience levels ($p<0.05$) but not significant at medium and high resilience levels ($p>0.05$).

Conclusion: Firefighters with high number of PTDS symptoms present more suicidal ideation especially when presenting lower levels of resilience. Therefore, psychological programs to firefighters must have a strong resilience-building component.

Keywords: Firefighters; post-traumatic stress disorder; resilience; suicide.

Besides fighting forest fires, firefighters must perform difficult tasks, such as freeing car crash victims, rescuing people who attempt suicide by jumping from tall buildings, and intervening in difficult emergencies that might result in serious injury or risk of death.[1] In a meta-analysis study conducted by Nazari et al.[2] (2020), 96.4% of firefighters had witnessed at least one kind of critical incident, 90% had witnessed one or two incidents resulting in death, and 81% had witnessed several incidents resulting in severe injuries.

Given the working characteristics of firefighters, who are repetitively and perpetually exposed to various traumatic experiences, they are at risk in terms of developing various mental problems.[3] Previous studies showed that professionals working in crisis and disaster scenarios could experience mental problems such as stress reactions, somatic symptoms, fatigue, post-traumatic stress disorder (PTSD), depression, anxiety, and misuse of alcohol.[4,5] In studies conducted nationally in various countries, such as China, Iran, Korea, and the United States, the prevalence of PTSD in firefighters varied between 4.89% and 57%.[6-8] Moreover, firefighters usually cannot benefit from psychological support services because of factors such as fear of stigmatization, privacy, and fire service culture.[9,10]

Since firefighters are exposed to dangerous and emotionally

Address for correspondence: Yücel Şavklı, İstanbul Gelisim University, Institute of Graduate Studies, İstanbul, Türkiye
Phone: +90 216 422 70 00 **E-mail:** yucel.savkli@hotmail.com **ORCID:** 0000-0002-2909-574X

Submitted Date: May 25, 2022 **Revised Date:** November 18, 2022 **Accepted Date:** December 11, 2022 **Available Online Date:** June 15, 2023

What is presently known on this subject?

- The fact that firefighters are exposed to risky and emotionally intense situations, as well as the threat of injury or death during their job increases not only PTSD symptoms but also the risk of suicide ideation.

What does this article add to the existing knowledge?

- The relationship between traumatic stress symptoms and suicidal ideation is significant in firefighters at low resilience levels.

What are the implications for practice?

- A practical implication of this study is that psychological programs for firefighters must have a strong resilience-building component.

intense situations, as well as the threat of injury or death during their job, they are more likely to experience not only PTSD symptoms but also the risk of suicide ideation.[11] Kimbrel et al.[12] (2016) reported in their study with a sample involving 61 firefighters that 41% of firefighters had lifelong suicide ideation and 8% had lifelong suicide plans. Similarly, Stanley et al.[13] (2015), in their study with a wider sample involving firefighters in America, working and retired, stated that 47% of the firefighters had suicide ideation, 19% planned suicide, and 16% had attempted suicide during their fire service careers. It was determined that among first responders, the suicide ideation and behavior rates were at higher levels compared to the population sample.[13,14] Moreover, PTSD symptoms were correlated to an increase in suicide risk among firefighters. In a study conducted in America that compares demographic, work-related, and mental health characteristics relating to PTSD symptoms and lifelong suicide ideation in female firefighters versus male firefighters (2020), approximately 30% of the women had lifelong suicide ideation, and PTSD was the main predictor of suicide ideation in this study.[5] Similarly, different studies show that even when comorbid psychiatric disorders are controlled in firefighters, the increase in PTSD symptoms correlates to the increase in suicide risk.[15,16]

Exposure to long-term and repetitive trauma, especially when related to PTSD symptoms, can increase suicidal ideation in firefighters.[15] Although PTSD and suicide prevalence are quite high in firefighters, there are few studies conducted on the subject of the association between PTSD symptoms and suicide and what kind of psychological factors can support this. Although some studies examined the correlation between gender, marital status, receiving counseling, and suicide,[5] others focused on the correlation between suicide, relationships, and physical health problems.[11] Negative factors like long working hours, increasing workload, no planned meal hours, and sleep interruptions contribute to the suicide process as well.[9] Firefighter culture perceives mental health problems as a sign of weakness.[17]

Considering the negative results of suicide ideation, researching protective factors such as resilience that could reduce the correlation between PTSD symptoms and suicide is critical.[11] These data can provide significant information about how to break the cycle of negative feedback in the process that starts with PTSD symptoms and leads to suicide. Resilience is the ability to cope with and recover from a stressful situation.[18] Although resilience was examined in various samples, firefighters who are in the high-risk group in terms of suicide were not studied enough. Considering that resilience is correlated to many positive results among individuals with difficulties[19] and that firefighters are inclined to experience stress at elevated levels.[3] examining the relationship between resilience and suicide in firefighters will fill a significant research gap.

In the study population, no study investigates the direct relation between resilience and suicide. Moreover, the concept of social support, which places resilience at a contextual level, involves the perception of a person regarding being a part of a social network and the support resources they can get help from in stressful situations. In firefighters, decreasing social support increased the level of suicide ideation by interacting with PTSD symptoms.[20] In a study conducted using data obtained from the National Severe Death Reporting System in America (2020), suicide cases among firefighters (772) and non-firefighters (192,430) were compared in terms of sociodemographic characteristics and risk factors. Those firefighters who died had experienced relationship problems before the suicide attempt. Similarly, it was proposed that suicide ideation and having relationship problems are determinants in suicides of firefighters completed with firearms.[11]

This study hypothesizes that the increase in PTSD symptoms will be related to the increase in suicide ideation levels and that high resilience will weaken the relation between PTSD symptoms and suicide. In this way, this study aims to analyze the moderating role of resilience in the relationship between PTSD symptoms and suicide ideation.

Materials and Method

Study Design

This cross-sectional and correlational study was conducted to analyze the moderating role of resilience in the relationship between PTSD symptoms and suicide ideation in firefighters.

Population and Sample

The population of the study consisted of 496 firefighters working within the fire station management and fire stations affiliated with Mersin Metropolitan Municipality Fire Brigade Department in Mersin province. There are 13 district fire stations and one central fire station affiliated with the Fire Brigade Department in which the study was conducted. The purposeful sampling method was used within the scope of the study, and the sample size was not calculated. The aim was to reach the entire population. The following criteria were considered when determining the individuals that would be included in the sample:

- Working in the fire company and fire stations
- Actively participating in tasks under the responsibility of the fire service personnel
- Being aged 18 and older
- Being in the workplace at the time of the application of the

questionnaire

Table 1 shows the number of personnel working in the fire company affiliated with the Fire Brigade Department and the number of individuals participating in the study.

Data Collection Tools

Data were collected using the demographic form, Brief Resilience Scale (BRS), Traumatic Stress Symptoms Scale (TSSS), and the Scale for Suicide Ideation.

Demographic Form

The form was created by the researchers in line with the relevant literature.[6,7,21] The demographic form comprises 13 questions relating to individual, vocational, and physical/mental health.

Brief Resilience Scale (BRS)

Developed by Smith et al.[22] (2008), the scale was adapted to Turkish by Doğan (2015). It is a valid and reliable tool used for measuring resilience.[23] The BRS is a self-report-based Likert type scale with values between 1 and 5, comprising six items in total. Items 2, 4, and 6 are reverse items. Scoring is performed by inverting the reverse items. The resilience level increases as the score obtained from the scale increases. The scale explained 54.66% of the total variance, and the eigenvalue is 3.28. The factor loads for the scale items ranged from 0.63 to 0.79. The internal consistency of the scale was calculated as 0.83 in the original study and 0.65 in this study. As a result of exploratory and confirmatory factor analyses, the scale has a single-factor structure.[23] Permission was obtained from the adapting author for use in this study.

Traumatic Stress Symptoms Scale (TSSS)

Turkish validity and reliability were completed by Aker et al.[24] (1999). The scale is employed for measuring post-traumatic stress symptoms. It is a scale answered by self-report with Likert type with scores ranging from 0 to 3 (Does Not Disturb at All, Disturbs A Little, Disturbs Quite A Lot, and Seriously Disturbs, comprising 24 items in total. From the scale on which operations are done through total scores, the lowest score that can be obtained is 0 and the highest is 72. High scores indicate that traumatic stress symptoms are high. In this study, Cronbach's alpha reliability coefficient was calculated as 0.93. The application of the scale was permitted in an electronic environment by the author, who completed the adaptation.

Suicide Ideation Scale (SIS)

The scale, adapted to Turkish by Dilbaz et al.[25] (1995), is used to determine suicide ideation. Consisting of 17 items in total, the scale has a dichotomous answer in the 0–1 (0=Wrong, 1=Right) score interval. Although the scores that can be obtained from the scale range from 0 to 17, high scores indicate high suicide ideation. The internal consistency of the scale was determined to be 0.84 in this study. Permission was obtained from the author online for the use of the scale.

Data Collection

The data were collected by contacting fire service personnel during their free time between August 2020 and September 2020 with individuals who volunteered to participate in the study filling out the demographic form and scales based on self-report. Before collecting the data, the lists of all personnel and their affiliated companies were obtained, their shifts were determined, and the units were visited in line with this planning. Scales and survey applications were applied to the personnel in groups of 10 one-to-one under the supervision of the researcher.

Ethical Issues

Ethics committee approval was obtained from Istanbul Gelişim University Ethics Committee (Date: 21.08.2020, Decision No: 2020-27-12). Corporation approval was obtained from the Fire Brigade Department affiliated to the Mersin Metropolitan Municipality (Date: 15.06.2020, Number: E-73885581-903.99-

Table 1. Sample scope by region (n=316)

Region	Total number	Not agree to participate	Missing data	Number of participants
Merkez Group Superiority	62	20	13	29
Akdeniz/Aydıncık Group Superiority	58	30	16	12
Mezitli Group Superiority	63	21	8	34
Toroslar Group Superiority	37	9	13	15
Yenişehir Group Superiority	35	4	6	25
Anamur/Bozyazı Group Superiority	48	10	9	29
Tarsus/Çamlıyayla Group Superiority	86	3	0	83
Erdemli Group Superiority	32	1	6	25
Gülnar Group Superiority	22	2	3	17
Mut Group Superiority	22	0	2	20
Silifke Group Superiority	31	4	0	27
Total	496	104	76	316

Table 2. Individual characteristics of the participants (n=316)

Variables	n	%	$\bar{x}$ ± SD	Min - Max
Age			40.81±9.38	20-62
Gender				
Male	316	100		
Educational status				
Primary school	44	13.9		
Elementary school	66	20.9		
Highschool	127	40.2		
Bachelor's degree/graduate	79	25.0		
Marital status				
Married	263	83.2		
Single	44	13.9		
Divorced	9	2.8		
Having a child				
No	101	32.0		
Yes	215	68.0		
Number			2.03±0.80	1-5
Economic status				
Low	104	32.9		
Moderate	210	66.5		
High	2	.6		
Working status				
Labourer	179	56.6		
Officer	81	25.6		
Contractual	56	17.7		
Physical diseases				
No	299	94.6		
Yes	17	5.4		
Type				
Heart conditions	2	11.8		
Hyper tension	3	17.6		
Diabetes	4	23.6		
Unspecified	8	47		
Psychiatric diseases				
No	314	99.4		
Yes	2	.6		
Type				
Panic disorder	1	50		
Unspecified	1	50		
Using medicines				
No	291	92.1		
Yes	25	7.9		
Type				
Antidiabetic	6	20		
Antihypertensive	8	26.7		
Heart medicine	3	10.1		
Cholesterol medicine	1	3.3		
Antiaggregant	2	6.6		
Gastroprotective	1	3.3		
Antiallergic	1	3.3		
Unspecified	8	26.7		

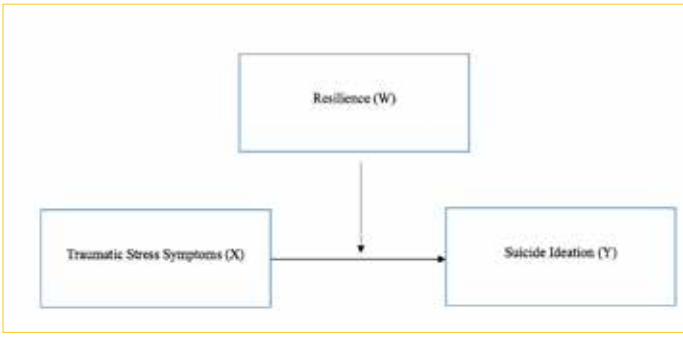

Figure 1. Moderating role of resilience in the relation between posttraumatic stress disorder symptoms and suicide ideation

70773). Permission to use the scales was obtained from the authors. Participants were guaranteed that they could quit the research at any time. Time was given as required for them to answer their questions. Informed consent has been signed. Before the questionnaires were completed, the participants were informed about the sources they could get psychological support. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Moderation Diagram

Figure 1 shows the moderation diagram of the research.

Data Analysis

The data were analyzed using the SPSS 22.00 (SPSS, Chicago, IL, USA) program. The independent variables in the research were traumatic stress symptoms and resilience; the dependent variable was suicide ideation. Moderator analysis was examined based on the PROCESS macro model 1 developed by Hayes (2013).[26] The level of statistical significance was determined to be $p<0.05$. Questionnaires with missing data were not included in the analysis.

Results

Profile of the Participants

Participants had an average age of 40.81±9.38 years (min: 20, max: 62) and were all male (100%; n=316). Most were married (83.2%; n=263). Approximately two-thirds of them (68%, n=215) had 2.03±0.80 (min: 1, max: 5) children and were high school graduates (40%, n=127) (Table 2). Although almost two-thirds of the participants (66.5%; n=210) stated their income was "moderate," half of them (56.6%; n=179) worked as laborers.

The vast majority did not have any physical (94.6%; n=299) or psychiatric (99.4%%; n=314) disease requiring treatment. In the scope of physical and/or mental health problems requiring treatment, there were diseases such as diabetes, hypertension, heart conditions, and panic disorder. Similarly, the majority of the medications used were antihypertensive and antidiabetic drugs (Table 2).

Table 3. Traumatic stress symptom scale, suicide ideation scale, and brief resilience scale profile of the participants

Scales	x̄±SD	Min-Max	Range
Traumatic Stress Symptoms Scale	10,87±11,57	0-62	0-72
Suicide Ideation Scale	4,82±3,60	1-16	0-17
Brief Resilience Scale	23,34±5,24	10-30	6-30

Traumatic Stress Symptom Scale, Suicide Ideation Scale, and BRS Profile of the Participants

In Table 3, the Traumatic Stress Symptom Scale score average for participants was 10.87±11.57 (min: 0, max: 62), the Suicide Ideation Scale score average was 4.82±3.60 (min: 1, max: 16), and the BRS score average was 23.34±5.24 (min: 10, max: 30) (Table 3).

Correlations between Traumatic Stress Symptom Scale, Suicide Ideation Scale, and BRS Scores of the Participants

Table 4 shows the correlations between the scales. There was a positive and weak significant relationship between the Traumatic Stress Symptom Scale score average and the Suicide Ideation score average ($r=-0.142$, $p<0.05$). Moreover, there was a negative and weak significant relationship between the Traumatic Stress Symptom Scale score average and the BRS score average ($r=-0.258$, $p<0.01$). There was a negative and weak significant relationship between the BRS score average and the Suicide Ideation score average ($r=-0.253$, $p<0.01$) (Table 4).

Moderating Role of Resilience in the Relation between Traumatic Stress Symptoms and Suicide

Tables 5–6 and Figure 2 present the findings regarding the moderating role of resilience in the relation between traumatic stress symptoms and suicide.

Traumatic stress symptoms and resilience variables included in the regression analysis significantly explained 8% ($R2=0.085$) of the change in suicide ideation, which was the dependent variable. Table 5 shows the unstandardized regression coefficients (β) showing the effects of each predictor variable on the dependent variable. Although traumatic stress symptoms are directly effective on suicide ideation ($\beta=6.364$; $t=2.569$; $p<0.001$), resilience is not directly effective on suicide ideation ($\beta=-0.074$; $t=-1.376$; $p>0.05$). Accordingly, it was determined

Table 4. Correlations between traumatic stress symptom scale, suicide ideation scale, and brief resilience scale scores of the participants

Scales	TSS	SI
SI	,142*	
R	-,258**	-,253**

**p<.01, *p<.05, Traumatic Stress Symptoms (TSS), Suicide Ideation (SI), Resilience (R)

Table 5. Moderating role of resilience in the relation between traumatic stress symptoms and suicide (n=316)

	β (LLCI-ULCI)	SE	t	p	R	R2
Constant	6,364 (3,812 : 8,915)	1,296	4,908	<,001	,292	,085
Traumatic Stress Symptoms (X)	,180 (0,042 : 0,318)	,070	2,569	<,05		
Resilience (W)	-,074 (-0,180 : 0,031)	,053	-1,376	<,169		
X*W	-,007 (-0,013 : -0,001)	,003	-2,274	<,05		

Suicide Ideation Scace (SI); SE (Standart error); LLCI (Lower level of confidence ınterval); ULCI (Upper level of confidence interval) concepts refer to the standard error of the effect estimated by the bootstrapping method at the 95% confidence interval, respectively. β, refers to the non-standardized regression coefficient showing the effects of each predictive variable on the outcome variable.

Table 6. The low, moderate, and high-level effects of resilience in the relation between traumatic stress symptoms and suicide (-1, average, and +1 standard deviation value)

Resilience	Effect	se	t	p	LLCI	ULCI
Low resilience (Z=18,090)	0,0461	0,019	2,344	,019	0,007	0,084
Moderate resilience (Z[a] =23,339)	0,007	0,019	0,369	,711	-0,030	0,045
High resilience (Z=28,589)	-0,031	0,030	-1,033	,302	-0,092	0,028

[a]PThe mean Z score for resilience shows the standardized mean resilience score of the sample (23.34). Low resilience (18.09) represents 1 standard deviation below the mean and high resilience (28.59) represents 1 standard deviation above the mean. SE (Standart error), LLCI (Lower level of confidence ınterval), ULCI (Upper level of confidence interval) concepts refer to the standard error of the effect estimated by the bootstrapping method at the 95% confidence interval, respectively. The concept of Effect refers to the non-standardized regression coefficient that shows the effect of each predictive variable on the outcome variable.

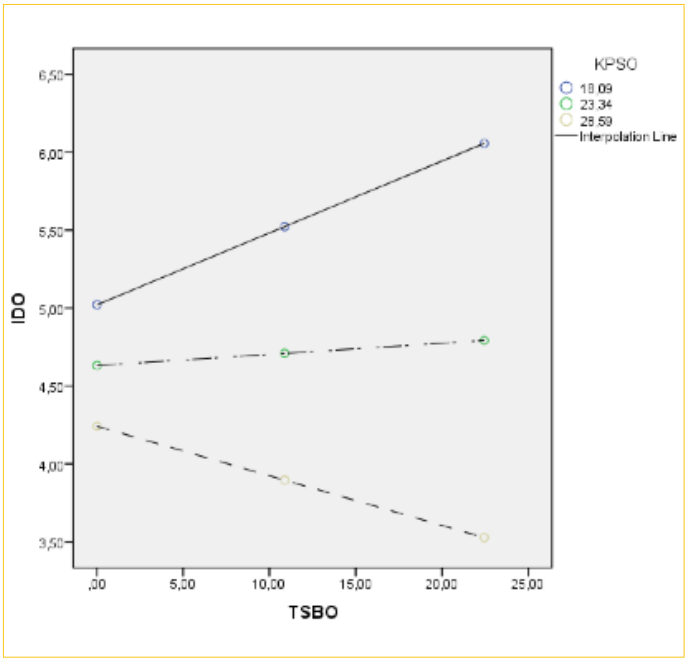

Figure 2. The relation between traumatic stress symptoms and suicide ideation for different resilience levels (n=316)

Traumatic Stress Symptoms (TSBÖ), Suicide Ideation (İDÖ), and Resilience (KPSÖ), The mean Z score for resilience shows the standardized mean resilience score of the sample (23.34). Low resilience level (18.09) represents 1 standard deviation below the mean, and high resilience level (28.59) represents 1 standard deviation above the mean.

that traumatic stress symptoms experienced at elevated levels is related to an increase in suicide ideation. Since the interaction between traumatic stress symptoms × resilience is significantly related to suicide ideation, it was revealed that resilience had a moderating effect on the relationship between traumatic stress symptoms and suicide ideation (β=–0.007; t=–1.003; p<0.05) (Table 5). This situation shows that the correlation between traumatic stress symptoms and suicide ideation changes according to resilience level.

While examining the conditional effects of traumatic stress symptoms on suicide ideation at different resilience levels (that is, low [–1 standard deviation [SD], medium [z score of 0], and high [+1SD]), the correlation between traumatic stress symptoms and suicide ideation was at highest levels with low resilience levels (p<005). At medium and high resilience levels, the relationship between traumatic stress symptoms and suicide ideation was not significant (p>0.05) (Table 6 and Fig. 2). Figure 2 also the change in the correlation between traumatic stress symptoms and suicide ideation at different resilience levels. The findings show that resilience lessened the correlation between traumatic stress symptoms and suicide ideation by regulating this association.

Discussion

This study was conducted to analyze the moderating role of resilience in the relationship between PTSD symptoms and

suicide ideation in firefighters. In this study, unlike previous studies focusing on risk factors, the focus was whether resilience, which is a protective factor, narrowed the correlation between PTSD symptoms and suicide ideation.

One of the important findings of the study is that traumatic stress symptoms experienced at elevated levels are related to an increase in suicide ideation. This finding is similar to current research results revealing that PTSD symptom severity are significantly related to lifelong suicide ideation and attempts in firefighters.[13,15,16,27] Considering the research results proposing that PTSD symptoms are determinants of suicide ideation,[13] firefighters examined in the scope of the sample can be considered to have suicidal ideation as a consequence of a traumatic event. Moreover, the results of the study illustrate the importance of doing more research on the relationship between PTSD and suicide in firefighters who are exposed to long-term and repetitive trauma and who are in the increased risk group in terms of PTSD symptoms.[16,27]

One other important finding of the study is that resilience does not have a direct determinant effect on suicide ideation. Contrary to this result, decreasing social support in firefighters, which includes resilience contextually, was revealed to increase suicide ideation by interacting with PTSD symptoms.[28] Similarly, in a study where suicide cases among firefighters and non-firefighters were compared in terms of various characteristics, those firefighters who died had relationship problems before the suicide attempt. Having relationship problems was identified as a determinant in the suicides of firefighters using firearms.[11] Moreover, although no significant relationship was found between perceived distress tolerance and global suicide risk in a study conducted by Bartlett et al.[27] (2018), distress tolerance perceived at a low level significantly predicts suicide ideation only for the previous year. This finding may have a few explanations. The first is that although the validity and reliability studies for the measurement tool widely used in resilience measurement were completed, it is based on self-reports and is limited to six items. In this study, resilience was taken as only an individual characteristic. Furthermore, the concept of resilience is explained with various aspects at the individual, relational, and contextual levels.[19] The second reason is that since the sample of the study consists of firefighters working in fire departments in only one province, it may not represent all firefighters.

The correlation between traumatic stress symptoms and suicide ideation is at the highest levels with low resilience levels. Nevertheless, at medium and high resilience levels, the relationship between traumatic stress symptoms and suicide ideation was not significant. This finding indicates that firefighters who can recover quickly after continuous and repetitive exposure to traumatic experiences may develop suicide ideation depending on whether traumatic stress symptoms can be reduced. Among the samples exposed to trauma, no studies indicated that resilience has a moderating effect on the relationship between traumatic stress symptoms and suicidality. Resilience is considered to have multiple dimensions in the interactional resilience model of Ungar (2013).[19] Although this study focuses on the individual level, defined as the ability to overcome negative life events, Ungar's model considers resilience at individual, relational, and contextual levels.[19] Therefore, the findings obtained from the current research indicate that resilience on an individual level is protective against suicide ideation that can develop depending on traumatic stress symptoms in firefighters. The reason for this is probably that the resilience of firefighters enables them to manage traumatic stress symptoms and suicide ideation relating to these symptoms more effectively.

Conclusion

The results of the research contribute to the suicide literature since they show how traumatic stress symptoms increase suicide ideation and how resilience can have a risk factor role in this relationship. Considering the results of the present study, the role of resilience was a dampener/buffer in a relationship, that is, its role as a risk factor. Resilience is only a significant moderator when it is low. Moreover, examining resilience in firefighters with suicide ideation is a new and undiscovered research area. Including resilience in intervention programs to be created for suicide ideation that emerges depending on traumatic stress symptoms in firefighters can enable this group to manage traumatic stress symptoms and suicide ideation relating to these symptoms more effectively.

According to the research results, it is suggested to develop and/or apply resilience-based intervention programs for firefighters to manage traumatic stress symptoms and suicide ideation relating to these symptoms more effectively. Firefighters with a high number of post-traumatic stress disorder symptoms present more suicidal ideation especially when presenting lower levels of resilience. Hence, a practical implication of this study is that psychological programs for firefighters must have a strong resilience-building component. Furthermore, to eliminate bias, there is a need for deliberative studies where all dimensions of resilience, traumatic stress symptoms, and suicide are discussed and where experimental designs are utilized together. Although the whole of the sample consists of males, concepts can be researched in female workers as well. To examine the change in causality relationships and related concepts over time, prospective and longitudinal studies are needed. Since the sample group studied was from a metropolis and a single region, the trauma exposure rates and types can vary compared to small cities and other regions. This situation shows the need for studies to be conducted in samples that represent firefighters nationally.

Limitations

Since the data were obtained from a single province, the research results may vary when there is a bigger sample including different provinces. As the province in which the study was conducted was a metropolis and a specific region, the

research results may not be generalized to firefighters from other provinces/districts. The answers the personnel participating in the study gave to questionnaire/scale questions may involve bias in terms of social acceptance, concerns about the effect on vocational position, and socio-cultural expectations and constraints.

Conflict of interest: There are no relevant conflicts of interest to disclose.

Peer-review: Externally peer-reviewed.

Authorship contributions: Concept – Y.Ş., F.Ş.G.; Design – Y.Ş., F.Ş.G.; Supervision – F.Ş.G.; Fundings - Y.Ş.; Materials – Y.Ş., F.Ş.G.; Data collection &/or processing – Y.Ş.; Analysis and/or interpretation – Y.Ş., F.Ş.G.; Literature search – Y.Ş., F.Ş.G.; Writing – Y.Ş., F.Ş.G.; Critical review – Y.Ş., F.Ş.G.

References

1. Becker JP, Paixão R, Quartilho MJ. A relational model for stress: A systematic review of the risk and protective factors for stress-related diseases in firefighters. Psych 2020;2:74–84.
2. Nazari G, MacDermid JC, Sinden K, D'Amico R, Brazil A, Carleton N, et al. Prevalence of exposure to critical incidents in firefighters across Canada. Work 2020;67:215–22.
3. Griffith JC, Roberts DL. How we roll: A fire engine to every call? Fire department resource allocation and firefighter support in the United States. Int J Emerg Serv 2020;9:409–19.
4. Brooks SK, Dunn R, Amlôt R, Greenberg N, Rubin GJ. Social and occupational factors associated with psychological distress and disorder among disaster responders: A systematic review. BMC Psychol 2016;4:18.
5. Noor N, Pao C, Dragomir-Davis M, Tran J, Arbona C. PTSD symptoms and suicidal ideation in US female firefighters. Occup Med (Lond) 2019;69:577–85.
6. Sun X, Li X, Huang J, An Y. Prevalence and predictors of PTSD, depression and posttraumatic growth among Chinese firefighters. Arch Psychiatr Nurs 2020;34:14–8.
7. Salleh MNBM, Ismail HB, Yusoff HBM. Prevalence and predictors for PTSD among Firefighters: A systematic review. Int J Public Health Res 2020;10:1183–95.
8. Kim JE, Dager SR, Jeong HS, Ma J, Park S, Kim J, et al. Firefighters, posttraumatic stress disorder, and barriers to treatment: Results from a nationwide total population survey. PLoS One 2018;13:e0190630.
9. Gulliver SB, Pennington ML, Torres VA, Steffen LE, Mardikar A, Leto F, et al. A. Behavioral health programs in fire service: Surveying access and preferences. Psychol Serv 2019;16:340–5.
10. Tamrakar T, Langtry J, Shevlin M, Reid T, Murphy J. Profiling and predicting help-seeking behaviour among trauma-exposed UK firefighters. Eur J Psychotraumatol 2020;11:1721144.
11. Pennington ML, Ylitalo KR, Lanning BA, Dolan SL, Gulliver SB. An epidemiologic study of suicide among firefighters: Findings from the National Violent Death Reporting System, 2003 - 2017. Psychiatry Res 2021;295:113594.
12. Kimbrel NA, Pennington ML, Cammarata CM, Leto F, Ostiguy WJ, Gulliver SB. Is cumulative exposure to suicide attempts and deaths a risk factor for suicidal behavior among firefighters? A preliminary study. Suicide Life Threat Behav 2016;46:669–77.
13. Stanley IH, Boffa JW, Tran JK, Schmidt NB, Joiner TE, Vujanovic AA. Posttraumatic stress disorder symptoms and mindfulness facets in relation to suicide risk among firefighters. J Clin Psychol 2019;75:696–709.
14. Nock MK, Borges G, Bromet EJ, Cha CB, Kessler RC, Lee S. Suicide and suicidal behavior. Epidemiol Rev 2008;30:133–54.
15. Martin CE, Tran JK, Buser SJ. Correlates of suicidality in firefighter/EMS personnel. J Affect Disord 2017;208:177–83.
16. Bing-Canar H, Ranney RM, McNett S, Tran JK, Berenz EC, Vujanovic AA. Alcohol use problems, posttraumatic stress disorder, and suicide risk among trauma-exposed firefighters. J Nerv Ment Dis 2019;207:192–8.
17. Dill J, Lowe C. Suicide in the fire and emergency services. Greenbelt, MD: National Volunteer Fire Council; 2012. Available at: https://www.nvfc.org/wp-content/uploads/2015/09/ff_suicide_report.pdf. Accessed Jun 14, 2023.
18. Lee JH, Nam SK, Kim AR, Kim B, Lee MY, Lee SM. Resilience: A meta-analytic approach. J Couns Dev 2013;91:269–79.
19. Ungar M, Ghazinour M, Richter J. Annual research review: What is resilience within the social ecology of human development? J Child Psychol Psychiatry 2013;54:348–66.
20. Carpenter GS, Carpenter TP, Kimbrel NA, Flynn EJ, Pennington ML, Cammarata C, et al. Social support, stress, and suicidal ideation in professional firefighters. Am J Health Behav 2015;39:191–6.
21. Marshall RD, Olfson M, Hellman F, Blanco C, Guardino M, Struening EL. Comorbidity, impairment, and suicidality in subthreshold PTSD. Am J Psychiatry 2001;158:1467–73.
22. Smith BW, Dalen J, Wiggins K, Tooley E, Christopher P, Bernard J. The brief resilience scale: Assessing the ability to bounce back. Int J Behav Med 2008;15:194–200.
23. Doğan T. Kısa psikolojik sağlamlık ölçeği'nin Türkçe uyarlaması: Geçerlik ve güvenirlik çalışması. J Happiness Well-Being 2015;3:93–102.
24. Aker AT, Özeren M, Başoğlu M. Kaptanoğlu C, Erol A, Buran B. Klinisyen tarafından uygulanan travma sonrası stres bozukluğu ölçeği (TSSB-Ö). Turk J Psychiatr [Article in Turkish] 1999;10:286–93.
25. Dilbaz N, Holat H, Bayam G, Tüzer T, Bitlis V. İntihar düşüncesi ölçeğinin geçerlilik ve güvenirliği. 31. Ulusal Psikiyatrik Bilimler Kongresi Bilimsel Çalışma Kitabı; 1995. p.40–1.
26. Hayes AF. Introduction to mediation, moderation, and conditional process analysis: A regression-based approach. New York; Guilford Publications; 2013.
27. Bartlett BA, Jardin C, Martin C, Tran JK, Buser S, Anestis MD, et al. Posttraumatic stress and suicidality among firefighters: The moderating role of distress tolerance. Cognit Ther Res 2018;42:483–96.
28. Carpenter TP, Pennington M, Seebeck J, Gomez DR, Denman TC, Kimbrel NA, et al. Dispositional self-forgiveness in firefighters predicts less help-seeking stigma and fewer mental health challenges. Stigma Health 2020;5:29–37.