Resilience among Delhi-NCR First Line Responders and its Links with Secondary Traumatic Stress

Mandeep Sharma[1] Arushi Sbharwal[2] HL Joshi[3] Rahul Singh[4]

ABSTRACT

First Responders refer to individuals in those professions who are usually the first to arrive at a scene of disaster or accident or are the first to interact and communicate with the victims. Thus, they are more frequently exposed to potentially traumatic events than the general population, making them high-risk professionals for developing various mental and physical health ailments. This study aimed to understand the difference in resilience and secondary traumatic stress levels in different groups of first-line responders and found the relationship between the two variables. Data was collected using the Secondary Traumatic Stress Response Scale (STSS) and the Brief Resilience Scale (BRS). The sample consisted of 160 participants divided into four groups -Doctors (n=40), Nurses (n=40), Police Personnel (n=40), and Fire Fighters (n=40), residing and working in Delhi-NCR. Results were computed using SPSS software. Findings suggested a negative relationship (r = -.37) between resilience and secondary traumatic stress (STS) experienced by first responders, indicating resilience may be a protective factor against STS. Furthermore, results also indicated that Doctors and Nursed report lesser secondary traumatic stress than firefighters and police personnel. In contrast, Doctors reported higher resilience than all other groups. Several factors, such as the nature of their jobs and duration, intensity, and frequency of exposure to victims' trauma, could account for these differences.

Keywords: *Secondary Traumatic Stress, Resilience, First line Responders*

About authors:

[1] Assistant Professor, Department of Psychology,
KLP PG college Rewari

[2] MAPC Learner,
IGNOU, NEW DELHI

[3] Professor , Department of Psychology
Kurukshetra University,Kurukshetra (H.R)

[4] Research Scholar, Department of Psychology
Kurukshetra University,Kurukshetra (H.R)

INTRODUCTION

First responders are usually those professionals specifically trained to be the first people available to provide emotional and physical support to survivors immediately after accidents or disasters. Depending on their job profiles, the roles of first-line responders could range from attending to casualties, recovering dead bodies, taking charge of safety and security at the scene, hearing trauma narratives, etc. In this sense, by virtue of their work, professionals such as police officers, firefighters, emergency and paramedic teams, detectives, healthcare professionals, etc., are routinely exposed to challenging, highly stressful, risky, and draining situations (Benedek et al., 2007).

More than 80% of paramedics admitted having had an upsetting occurrence in the previous six months, according to Alexander and Klein's (2001) study. It is no surprise that regularly witnessing, experiencing, or hearing about such traumatic events and assisting survivors and their families daily may overwhelm the individual, impacting their ability to cope and adapt adequately. For instance, it has been found that 69 percent of Emergency Medical Service professionals do not get enough time between traumatic events to recover (Bentley et al., 2013), suggesting an inability to process trauma exposure effectively. Thus, it can be concluded that due to the nature of their work and elevated stress levels, first-line responders are at a higher risk of developing mental health concerns than the general population (Herman, 1997). Moreover, first responders also report a higher incidence of emotional exhaustion, irritability, fatigue, sleep disturbances (Eriksson et al., 2001), and frequent intrusive images (Burns et al., 2008). Hence, these findings indicate those first responders may be at high risk of developing symptoms of traumatization.

Emergency personnel who are first responders during catastrophic events frequently experience secondary traumatic stress (STS), which is the stress obtained from assisting and helping those suffering or who have undergone some trauma (Figley, 1999). It is a stress response that might follow after indirect exposure to a

traumatic event, such as death, injury, or other kinds of physical harm to another person. Therefore, professionals who frequently come into contact with trauma survivors and are exposed to details of traumatic events as part of their jobs, such as doctors, nurses, police officers, firefighters, and law enforcement officials, may experience a traumatic response without having personally gone through the traumatic event. Compassion fatigue, also coined by Figley (1995), is defined as a 'state of exhaustion and dysfunction, biologically and emotionally' (Figley, 1995) and can be interchangeably used with STS.

Similar PTSD symptoms seen in STS include intrusive symptoms (repeated trauma-related thoughts, nightmares, and recollections), avoidance (making an effort to repress or suppress feelings, thoughts, and memories associated with the traumatic experience), and physiological arousal (increased vigilance, anxiety, and impatience). In fact, in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V), in the diagnostic criteria for PTSD, the etiological factor was extended to include indirect exposure to a traumatic event. Specific symptoms include constant fatigue, frequent illness, pessimism and hopelessness, irritability and anger, lack of motivation and reduced productivity, despair, sadness, feelings of re-experiencing the event, nightmares, anxiety, and loss of pleasure in usual activities are also common (Siegfried, 2008). Moreover, depression can also be an everyday response post-exposure to a traumatic event. Research suggests that half of all people with PTSD also have a coexisting depressive disorder (Rytwinski et al., 2013). Moreover, burnout and secondary traumatic stress have been significantly related to higher anxiety and depression levels (Hegney et al., 2013).

Such an outbreak of secondary traumatic stress, alongside other occupational stressors, amongst first-line responders, may inevitably impact their psychosocial well-being. For instance, such stressors can harm a professional's relationship with their family, friends, and relatives and reduce productivity at work and in the workplace. Unwanted behaviors by professionals include increased absenteeism, arriving late or departing early, and forgetting important everyday chores (Zimberoff & Hartman, 2014). Moreover, the experience of secondary traumatic stress may also damage the relationship between the professionals and their clients or target population. Given the nature of their work, in recent years, the scientific focus has shifted from this paradigm towards more health-promoting factors among first-line responders, and the concept of resilience has gained increasing attention as a protective factor in this regard.

Psychological resilience is the ability to cope effectively and adapt in the face of adversity (Tugade & Fredrickson, 2004). In other words, resilience refers to the ability to "bounce back" or recover from adverse or stressful life conditions. Individuals with a higher level of resilience are more likely to experience greater positive emotionality, tend to be more self-confident, have higher self-worth, and cope more effectively (Tugade & Fredrickson, 2004). Thus, resilience can be considered an integral factor for healthier psychological adjustment.

In terms of occupational stress, higher resilience is linked to optimizing job performance (Arnetz et al. 2008) and decreased risk of burnout (Velichkovsky, 2009). Resilience is generally known to be crucial to personal well-being and effectiveness in various professions (Robertson et al., 2015). Resiliency is especially important given the stress and trauma exposure encountered by those working as first responders and in the medical field. Rescue professionals were found to be more resilient than the general population in studies comparing the two groups (Streb et al., 2014). Furthermore, in a sample of police officers, greater resilience has been linked to less intense distress (Velichkovsky, 2009). First-line responders' feelings of community, self-efficacy and collective efficacy have all been linked to high levels of resilience (Pietrantoni & Prati, 2009).

In line with the idea that 'care comes with a cost,' it can be concluded that due to the demands of their profession, first-line responders are at significant risk of ill mental and physical health, necessitating a need for improving their overall well-being. Thus, the present study aims to understand whether the presence of 'Psychological Resilience' in first-line responders acts as a protective factor against secondary traumatic stress responses. Moreover, it will also explore the difference in the level of STS and resilience as experienced by different categories of first responders to establish whether the specific nature of their job profiles contributes to significant differences between the groups.

METHODOLOGY

Objectives

The present study aims to achieve the following objectives:

1. To assess and compare the level of secondary traumatic stress experienced by different groups of first-line responders (Doctors/Physicians, Nursing Staff, Police Personnel, and Firefighters).
2. To assess and compare the level of psychological resilience in different groups of first-line responders (Doctors/Physicians, Nursing Staff, Police Personnel, and Firefighters).
3. To study the relationship between secondary traumatic stress and resilience among first-line responders.

Hypotheses

1. There will be no significant difference in the levels of secondary traumatic stress experienced by different groups (Doctors/Physicians, Nursing

Staff, Police Personnel, and Firefighters) of first-line responders

2. There will be no significant difference in the levels of psychological resilience demonstrated by different groups (Doctors/Physicians, Nursing Staff, Police Personnel, and Firefighters) of first-line responders.
3. There will be no significant relationship between secondary traumatic stress experienced by first-line responders and the psychological resilience demonstrated.

Sample

Data were collected from 160 participants (N=160) across four groups of first-line responders. These include doctors/physicians (n1=40), nursing staff (n2=40), police personnel (n3=40), and Firefighters (n4=40) who are currently residing and working in government and private setups in Delhi NCR. A convenience sampling method was used for this purpose.

Measurement Tools

The Secondary Traumatic Stress Scale (Bride et al., 2014)

It is a 17-item self-report measure used to assess the traumatic stress experienced by professionals working with a traumatized population. Consistent with the DSM-V diagnostic criteria of PTSD, the STSS has three domains of secondary traumatic stress (STS): intrusion, avoidance, and arousal. Responses are given on 5 points Likert-type scale, ranging from "0=never" to "4=Very often." For the full STSS scale, reliability was found to be .93; for the intrusion subscale, it was .80; for the avoidance scale, it was .87; and for the arousal subscale, it was .83 (Bride et al., 2004).

The brief resilience scale (Smith et al., 2008)

It is a self-report measure comprising six items: three are positively worded, and three are negatively worded. The BRS is known to have good internal consistency, with Cronbach's alpha ranging from .80 – .90. The test-retest reliability, as measured on 48 undergraduate students one month apart, was .69, and for 61 cardiac rehabilitation patients three months apart was .62 (Smith et al., 2008).

Procedure

The research was carried out with first-line responders from Delhi-NCR, working as one of the four – Doctors, Nurses, Police Personnel & Fire Fighters. Participants were approached through common acquaintances or references, who then connected us to their colleagues in the same or different organizations. Data were collected using two self-administered questionnaires – The Secondary Traumatic Stress Scale (STSS) & The Brief Resilience Scale (BRS). The questionnaires were converted to Google Forms for easy accessibility and data collection. All participants were made aware of the study's objectives, and any doubts were addressed before administering the questionnaires.

Statistical Analysis

Data were analyzed using descriptive and inferential statistical methods. Mean, SD & One-way Analysis of Variance (ANOVA) with correlation were computed using SPSS software.

RESULTS

Depending on their line of work, participants were divided into four groups of first responders: doctors, nurses, police personnel, and firefighters—Table 1 displays the descriptive statistics.

Table 1

Descriptive Statistics

Characteristic	Doctors	Nurses	Police Personnel	Fire Fighters
n	40	40	40	40
Age [M(SD)]	49 (11.69)	30.05 (9.77)	35.05 (9.22)	35.30 (7.66)
STSS [M(SD)]	37.57(11.066)	37.75(14.098)	58.05 (7.802)	54.97 (13.907)
BRS [M(SD)]	20.77 (4.371)	17.85(2.694)	17.35(2.860)	18.45 (4.696)

One-way ANOVA was conducted to determine whether secondary traumatic stress and resilience levels differed for different groups of first-line responders. Participants were classified into four groups based on their profession – Doctors (n=40), Nurses (n=40), Police Personnel (n=40), and Fire Fighters (n=40). Data are expressed as mean ± standard deviation. Results indicate that levels of secondary traumatic stress (STSS score) are statistically significantly different for different groups of first-line responders, $F = 33.369$, $p < .005$ (Refer to Table 2). Therefore, the null hypothesis that there will be no significant difference in the levels of secondary traumatic stress experienced by different groups (Doctors/Physicians, Nursing Staff, Police Personnel, and Firefighters) of first-line responders is rejected. Similarly, it is found that level of resilience is also statistically significantly different for different groups of first-line responders, $F = 6.482$, $p < .05$. Thus, the null hypothesis, in this case, i.e., there will be no

significant difference in the levels of psychological resilience demonstrated by different groups (Doctors/Physicians, Nursing Staff, Police Personnel and Firefighters) of first-line responders, is also rejected.

Table 2

Summary of Secondary Traumatic Stress & Resilience

Variables		Sum of Squares	df	Mean Square	F	p
STS	Between Groups	14402.625	3	4800.875	33.369	<.01
	Within Groups	22444.150	156	143.873		
	Total	36846.775	159			
Resilience	Between Groups	275.119	3	91.706	6.482	<.01
	Within Groups	2207.075	156	14.148		
	Total	2482.194	159			

Note. STS= Secondary Traumatic Stress

STSS scores increased from Doctors (37.58 ± 11.07) to Nurses (37.75 ± 14.10), to Firefighters (54.98± 13.91) to Police Personnel (58.05 ± 7.80), in that order (Refer to Table 1). Post-hoc analysis was conducted using Fisher's least significant difference test to examine multiple comparisons, which revealed that the mean increase in STSS scores from Doctors to Firefighters (17.40, 95% CI [12.10, 22.70]), from Doctors to Police Personnel (20.48, 95% CI [15.18, 25.77]), from Nurses to Fire Fighters (17.23, 95% CI [11.93, 22.52]) as well as from Nurses to Police Personnel (20.30, 95% CI [15.00, 25.60]) are all statistically significant (p< .01). However, no other group differences were statistically significant (Refer to Table 3). It suggests that in the present study, doctors, as well as nurses, reported experiencing lesser secondary traumatic stress as compared to firefighters and police personnel.

Table 3

Mean differences among Doctors, Nursing Staff, Police Personnel, and Firefighters for both variables (ANOVA-Post hoc)

Dependent Variable	(I) frontlines	(J) frontlines	Mean Difference (I-J)	Sig.
Total Stress	1	2	17.40*	**.01**
		3	.175	.948
		4	20.47*	**.01**
	2	1	17.40*	**.01**
		3	17.22*	**.01**
		4	3.075	.253
	3	1	.175	.948
		2	17.22*	**.01**
		4	20.30*	**.01**
	4	1	20.47*	**.01**
		2	3.075	.253
		3	20.30*	**.01**
Resilience	1	2	2.32*	**.01**

	3	2.92*	**.01**
	4	3.42*	**.01**
2	1	2.32*	**.01**
	3	.60	.477
	4	1.10	.193
3	1	2.92*	**.01**
	2	-.60	.477
	4	.50	.553
4	1	3.42*	**.01**
	2	-1.1	.193
	3	.50	.553

Note. 1= Doctors, 2= Nursing staff, 3= Police personnel, 4= Firefighters

Furthermore, BRS scores increased from Police Personnel (17.35 ± 2.87) to Nurses (17.85 ± 2.69), to Firefighters (18.45 ± 4.70), to Doctors (20.78 ± 4.37) in that order (Refer to Table 1). Post Hoc analysis using Fisher's least significant difference test indicated the mean increase in BRS scores from Fire Fighters to Doctors (2.33 95% CI [0.66, 3.99]), from Nurses to Doctors (2.93, 95% CI [1.26, 4.59]) and from Police Personnel to Doctors (3.43, 95% CI [1.76, 5.09]), are all statistically different. However, no other group differences are statistically significant (Refer to Table 3). It indicates that Doctors reported being more resilient than the other three first-line responders.

Moving further, the Pearson product-moment correlation was used to determine the strength and direction of the relationship between secondary traumatic stress and psychological resilience in first-line responders. One hundred sixty participants were selected. As tabulated in Table 4, results indicate a statistically significant, moderate negative correlation between resilience and secondary traumatic stress response in first-line responders, *r=-.37, p < .01*.

Table 4

Correlation between resilience and measures of secondary traumatic stress

	Resilience	Intrusion	Avoidance	Arousal	Total STS
Resilience	1	-.263**	-.396**	-.372**	-.369**

***p<.01*

Moreover, it was also found that there is a statistically significant, moderate negative correlation between resilience and the avoidance (r=-.40, p < .001) and arousal (r=-.37, p < .001) subscales of secondary traumatic stress scale, however, a statistically significant, but low negative correlation was found between resilience levels and the intrusion subscale, r=-.26, p < .01. Thus, the null hypothesis, i.e., there will be no significant relationship between secondary traumatic stress experienced by first-line responders and psychological resilience demonstrated, is rejected, and the alternate hypothesis is accepted. This suggests that as resilience increases in first-line responders, the possibility of developing secondary traumatic stress decreases and vice versa.

DISCUSSION

Police Personnel, firefighters, Doctors, and Nurses, as part of their professions, perform various tasks that can significantly affect their mental and physical well-being. First responders are a "high-risk" occupational group operating in an inherently stressful environment. Moreover, they are also repeatedly exposed to critical incidents involving death or life-threatening injury. Examining these professionals' stressors and protective factors is vital to understand better how they can cope with various situations and perform successfully. The present study aimed to understand

the difference in levels of resilience and secondary traumatic stress among different groups of first-line responders and the relationship between the two variables for the given population.

The results revealed that secondary traumatic stress and resilience among first-line responders were negatively correlated, suggesting that the possibility of experiencing secondary traumatic stress may decrease as resilience increases. In other words, findings indicate that resilience could be one of the protective factors against secondary traumatic stress in the population considered. Several studies indicate resilience factors that prevent first responders from developing symptoms of secondary traumatization. In line with our findings, data has shown resilience to be a preventative factor for secondary traumatic stress and job burnout among human service professionals (Harker, Pidgeon, Klaassen, & King, 2016) and nurses (Back et al., 2016; Yu et al., 2019). Furthermore, a six-month follow-up study also found that first responders who reported high resilience experienced lesser PTSD symptomology (Joyce et al., 2019).

Numerous studies have already shown that resilient people are more likely to be able to properly deal with stress and trauma (Oginska-Bulik, 2015; McCain et al., 2017). They are more likely to be upbeat, adaptable, and able to control their emotions (New et al., 2009). The presence of better subjective mood states, a decline in the prevalence of stress-related disorders, and a decrease in the need for medical services are all associated with optimism and positivity (Haglund et al., 2007). These adaptive characteristics aid in replenishing emotional reserves, alleviating potential suffering, and enhancing constructive coping mechanisms (Folkman & Moskowitz, 2000). This viewpoint is backed up by Yu et al. (2019), who discovered that resilient nurses can lessen emotional weariness and pick up more adaptive coping mechanisms for dealing with work demands. These factors play an essential role in trauma processing and help them face the adverse outcomes of work-related stress.

The current study also shows that the levels of secondary traumatic stress differ in different groups of first-line responders. Compared to the general population, first responders are exposed to potentially traumatic incidents more frequently (Berger et al., 2012). They may also experience high arousal or dissociative states and feelings of helplessness when involved in important occurrences, which are frequently about the life or death of others and occasionally about their own. Due to their job description, individuals run the risk of developing posttraumatic stress disorder (PTSD) (Berger et al., 2012) or other mental health issues that are concomitant with traumatization (Kessler & Wang, 2008). Additionally, exposure to distressing situations and indirect exposure to them might lead to a secondary traumatic stress disorder, compassion fatigue, or burnout (Alexander & Klein, 2001).

In particular, the present study found doctors and nurses experiencing lesser secondary traumatic stress than police personnel and firefighters. This difference among the groups could be attributed to factors such as the different nature of their jobs, proximity, frequency, duration, and intensity of exposure to the trauma, and at what stage they are being exposed to other people's traumatic events. Police Personnel and Fire Fighters are typically the first to reach the site of an accident or disaster. As a result, they are the first people to be exposed to the trauma directly (by witnessing the event) or indirectly (by hearing victim stories and experiences and providing support and protection).

Earlier work supports our findings of increased STS in police and fire personnel. Police officers experience higher levels of secondary traumatic stress, according to a study that compared Italian police officers to medical professionals who serve as first responders. Additionally, compared to healthcare workers, some police officers experienced greater negative feelings and fatigue due to STS (Acquadro Maran et al., 2020). 7.6% of firefighters in a different study by Kehl et al. (2014) reported symptoms that met the diagnostic criteria for PTSD, including discouragement, trouble concentrating, hopelessness, cynicism, exhaustion, attrition, and lower levels of job satisfaction. Further, it has been found that prevalence rates of PTSD signs and symptoms among police officers are between 7 and 19 % (Carlier et al., 1997).

Although significantly lower than the other groups of first responders, as per the findings of this study, Healthcare professionals (HCP) do still experience secondary traumatic stress, more now than ever, that cannot be ignored. For instance, nurses working in emergency and operating rooms frequently encounter seriously injured patients. The nurses are still exposed to the underlying stories of agony and suffering even though the patient's horrifying wounds are frequently physically hidden when they enter the intensive care unit. Reviews demonstrate that specialized nurses in emergency, surgical, and intensive care rooms also report serious mental health issues (Adriaenssens & Maes, 2012).

Additionally, due to the COVID-19 epidemic, doctors and nurses may now be more at risk than in the past of experiencing pathological secondary traumatization. Before the COVID-19 outbreak, research reported an incidence of secondary traumatization among healthcare professionals ranging from 4% to 13%. (Greinacher et al., 2019). Many HCWs suffered from mood and sleep disorders during the COVID-19 pandemic (Luo et al., 2020). A study on Health Care Professionals (doctors, nurses, and allied healthcare professionals) during the COVID-19 lockdown in India it was found that 77% of HCPs reported a prevalence of STS (Manohar et al., 2021).

First responders may have high STS rates because caregivers may not exercise enough self-care, which leaves them vulnerable to secondary traumatization,

compassion fatigue, and burnout. According to research, first responders have trouble getting professional help for mental health issues (Crowe et al., 2015). The first responder culture discourages seeking professional assistance for mental health issues since responding to emergencies requires emotional and physical resilience and self-control (Crowe et al., 2015). Investigating how first responders maintain their resilience to cope and function successfully becomes essential.

Lastly, the findings of this study also revealed that significant difference exists even in the levels of resilience experienced by different groups of first responders. Although doctors reported experiencing lesser STS than Police Officers and Fire Fighters, data revealed that they have higher resilience than all other groups – Nurses, Fire Fighters and Police Personnel. This can also be interpreted in light of the negative relationship that has been established between resilience and STS, such that as STS is lower in Doctors, resilience is higher. Thus, one can conclude that resilience may act as a protective factor against STS for Doctors in the present study. As a result, Doctors might be expected to navigate the demands of their professional life more effectively and experience lower levels of burnout.

According to a national survey that evaluated resilience among physicians and US employees and supported the aforementioned conclusions, doctors had better levels of resilience than the broader working population (West et al., 2020). The lengthy and demanding process of becoming a doctor and subsequent training could be a plausible reason for these findings. Given the severity of this event, it stands to reason that practicing physicians will exhibit stronger resilience than other professionals. Additionally, preliminary research indicates that some medical professionals may have "vicarious resilience" (Hernández et al., 2007). According to this idea, Stevenson et al. (2011) made an effort to describe the views of Australian primary care providers toward their work and their level of job satisfaction. Doctors cited respect for their patients, keeping a sense of control, and enjoyment in their work as the three habits that allowed them to draw strength and resilience from their work.

Furthermore, several other factors could have contributed to the difference between the groups. It has been reported that inherent personality factors make an individual resilient. These include positive attitudes, optimism, the ability to regulate emotions, and seeing failure as beneficial feedback. (Tugade et al., 2004). Bolton et al. (2016) also found nine protective factors that contribute to resilience: interpersonal relationships, meaning in life, previous experience with adversity, grit, self-care, positive outlook on life, self-acceptance, determination, altruism, and independence. Hamby et al. (2018) found that resilience traits were also traits of community support, compassion for others, and emotional regulation. The presence of any of these factors could be a contributing factor to the higher level of resilience in Doctors. However, further studies would be required to establish the same.

CONCLUSION

Due to their job profiles, first responders are among the most vulnerable and high-risk populations to develop various mental and physical health concerns. In this context present study assessed four groups of first-line responders – Doctors, Nurses, Fire Fighters, and Police Personnel on their level of Secondary Traumatic Stress (STS) and Resilience. The existing literature in this area typically comes from the West, and not enough research has been conducted on the same with the Indian workforce. Thus, our study aimed to bridge this gap. A negative relationship was established between STS and resilience, which has been well documented in previous research. This indicated that resilience could be one of the preventive factors against STS, allowing one to use data from this study to improve factors related to mental health in this high-risk population. The results show that secondary traumatization differed for different groups of first responders, such that Doctors and Nurses reported lower levels than Fire Fighters and Police Personnel. In contrast, Doctors explored the highest level of resilience among the four groups. Several factors, such as the nature of their work, intensity, duration, frequency of exposure to trauma, access to self-care and mental health support, vicarious resilience, optimism, and ability to regulate emotions, can explain these differences. Further research needs to focus on the presence and impact of these factors in various groups of first responders and explore differences based on gender and social support, among other areas.

REFERENCES

3 Acquadro Maran, D., Zito, M., & Colombo, L. (2020). Secondary Traumatic Stress in Italian Police Officers: The Role of Job Demands and Job Resources. *Frontiers In Psychology*, *11*. https://doi.org/10.3389/fpsyg.2020.01435

4 Adriaenssens, J., De Gucht, V., &Maes, S. (2012). The impact of traumatic events on emergency room nurses: Findings from a questionnaire survey. *International journal of nursing studies*, *49*(11), 1411-1422.

5 Alexander, D. A., & Klein, S. (2001). Ambulance personnel and critical incidents: impact of accident and emergency work on mental health and emotional well-being. *The British Journal of Psychiatry*, *178*(1), 76-81.

6 Arnetz, B. B., Nevedal, D. C., Lumley, M. A., Backman, L., & Lublin, A. (2009). Trauma resilience training for police: Psychophysiological and performance effects. *Journal of Police and criminal Psychology*, *24*(1), 1-9.

7 Back, A. L., Steinhauser, K. E., Kamal, A. H., & Jackson, V. A. (2016). Building resilience for palliative care clinicians: an approach to burnout prevention based on individual skills and workplace factors. *Journal of pain and symptom management*, *52*(2), 284-291.

8 Bastug, G., Ergul-Topcu, A., Ozel-Kizil, E., & Ergun, O. (2019). Secondary Traumatization and Related Psychological Outcomes in Firefighters. *Journal Of Loss And Trauma*, *24*(2), 143-158. https://doi.org/10.1080/15325024.2018.1560898

9 Beck, A. T., & Steer, R. A. (1987). BDI, Beck depression inventory: manual. Psychological Corporation.

10 Beck, A. T., Steer, R. A., & Brown, G. K. (1996). Beck depression inventory (BDI-II) (Vol. 10, p. s15327752jpa6703_13). Pearson.

11 Beck, A., Steer, R., & Carbin, M. (1988). Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. Clinical Psychology Review, 8(1), 77-100. https://doi.org/10.1016/0272-7358(88)90050-5

12 Benedek, D., Fullerton, C., & Ursano, R. (2007). First Responders: Mental Health Consequences of Natural and Human-Made Disasters for Public Health and Public Safety Workers. *Annual Review Of Public Health*, *28*(1), 55-68. https://doi.org/10.1146/annurev.publhealth.28.021406.144037

13 Bentley, M., Crawford, J., Wilkins, J., Fernandez, A., &Studnek, J. (2013). An Assessment of Depression, Anxiety, and Stress Among Nationally Certified EMS Professionals. *Prehospital Emergency Care*, *17*(3), 330-338. https://doi.org/10.3109/10903127.2012.761307

14 Berger, W., Coutinho, E. S. F., Figueira, I., Marques-Portella, C., Luz, M. P., Neylan, T. C., & Mendlowicz, M. V. (2012). Rescuers at risk: a systematic review and meta-regression analysis of the worldwide current prevalence and correlates of PTSD in rescue workers. *Social psychiatry and psychiatric epidemiology*, *47*(6), 1001-1011.

15 Bock, C., Heitland, I., Zimmermann, T., Winter, L., & Kahl, K. (2020). Secondary Traumatic Stress, Mental State, and Work Ability in Nurses—Results of a Psychological Risk Assessment at a University Hospital. *Frontiers In Psychiatry*, *11*. https://doi.org/10.3389/fpsyt.2020.00298

16 Bolton, K. W., Praetorius, R. T., & Smith-Osborne, A. (2016). Resilience protective factors in an older adult population: A qualitative interpretive meta-synthesis. *Social Work Research*, *40*(3), 171-182.

17 Brennan, J., & McGrady, A. (2015). Designing and implementing a resiliency program for family medicine residents. The International Journal of Psychiatry in Medicine, 50(1), 104-114.

18 Bride, B., Robinson, M., Yegidis, B., & Figley, C. (2004). Development and Validation of the Secondary Traumatic Stress Scale. Research On Social Work Practice, 14(1), 27-35. https://doi.org/10.1177/1049731503254106

19 Burnett Jr, H. J., & Wahl, K. (2015). The compassion fatigue and resilience connection: A survey of resilience, compassion fatigue, burnout, and compassion satisfaction among trauma responders

20 Burns, C. M., Morley, J., Bradshaw, R., &Domene, J. (2008). The emotional impact on and coping strategies employed by police teams investigating internet child exploitation. *Traumatology*, *14*(2), 20-31.

21 Carlier, I. V., Lamberts, R. D., &Gersons, B. P. (1997). Risk factors for posttraumatic stress symptomatology in police officers: A prospective analysis. *The Journal of nervous and mental disease*, *185*(8), 498-506.

22 Cronje, J., &Vilakazi, M. (2020). Secondary traumatic stress in police detective officers dealing with complainants of sexual crimes. *South African Journal Of Psychology*, *50*(4), 520-529. https://doi.org/10.1177/0081246320923819

23 Crowe, A., Glass, J. S., Raines, J., Lancaster, M., & Waggy, M. (2015). Mental illness stigma among first responders and the general population. Journal of Military and Government Counseling, 3, 132-149.

24 Daniel, R. (2017). A Cop Doc's Guide to Public-Safety Complex Trauma Syndrome: Using Five Police Personality Styles.

25 Dunkley, J., & Whelan, T. A. (2006). Vicarious traumatisation: Current status and future directions. *British Journal of Guidance & Counselling*, *34*(1), 107-116.

26 Eriksson, C. B., Kemp, H. V., Gorsuch, R., Hoke, S., & Foy, D. W. (2001). Trauma exposure and PTSD symptoms in international relief and development personnel. *Journal of Traumatic Stress*, *14*(1), 205-212.

27 Folkman, S., & Moskowitz, J. T. (2000). Stress, positive emotion, and coping. *Current directions in psychological science*, *9*(4), 115-118.

28 Funder, D. C., & Block, J. (1989). The role of ego-control, ego-resiliency, and IQ in delay of gratification in adolescence. *Journal of personality and social psychology*, *57*(6), 1041.

29 Greinacher, A., Derezza-Greeven, C., Herzog, W., &Nikendei, C. (2019). Secondary traumatization in first responders: a systematic review. *European journal of psychotraumatology*, *10*(1), 1562840.

30 Haglund, M. E., Nestadt, P. S., Cooper, N. S., Southwick, S. M., & Charney, D. S. (2007). Psychobiological mechanisms of resilience: Relevance to prevention and treatment of stress-related psychopathology. *Development and psychopathology*, *19*(3), 889-920

31 Hamby, S., Grych, J., &Banyard, V. (2018). Resilience portfolios and poly-strengths: Identifying protective factors associated with thriving after adversity. *Psychology of violence*, *8*(2), 172.

32 Harker, R., Pidgeon, A. M., Klaassen, F., & King, S. (2016). Exploring resilience and mindfulness as preventative factors for psychological distress burnout and secondary traumatic stress among human service professionals. *Work*, *54*(3), 631-637.

33 Hegney, D., Craigie, M., Hemsworth, D., Osseiran-Moisson, R., Aoun, S., Francis, K., & Drury, V. (2013). Compassion satisfaction, compassion fatigue, anxiety, depression and stress in registered nurses in Australia: study 1 results. *Journal Of Nursing Management*, *22*(4), 506-518. https://doi.org/10.1111/jonm.12160

34 Herman, J. L. (2015). *Trauma and recovery: The aftermath of violence--from domestic abuse to political terror*. Hachette UK.

35 Hernández, P., Gangsei, D., & Engstrom, D. (2007). Vicarious resilience: A new concept in work with those who survive trauma. *Family process*, *46*(2), 229-241.

36 Heyman, M., Dill, J., & Douglas, R. (2018). *The Ruderman white paper on mental health and suicide of first responders* (pp. 1-41). Boston, MA: Ruderman Family Foundation.

37 Joyce, S., Tan, L., Shand, F., Bryant, R. A., & Harvey, S. B. (2019). Can resilience be measured and used to predict mental health symptomology among first responders exposed to repeated trauma?. *Journal of Occupational and Environmental Medicine*, *61*(4), 285-292.

38 Kehl, D., Knuth, D., Hulse, L., & Schmidt, S. (2014). Posttraumatic reactions among firefighters after critical incidents: Cross-national data. Journal of Aggression, Maltreatment & Trauma, 23, 842-853.

39 Kessler, R. C., & Wang, P. S. (2008). The descriptive epidemiology of commonly occurring mental disorders in the United States. *Annual review of public health*, *29*(1), 115-129.

40 KN, M., Parashar, N., Kumar, C. S., Verma, V., Rao, S., TR, H., ... & Kumar, C. (2021). Prevalence and severity of secondary traumatic stress and optimism in Indian health care professionals during COVID-19 lockdown. *PloS one*, *16*(9), e0257429.

41 Luftman, K., Aydelotte, J., Rix, K., Ali, S., Houck, K., Coopwood, T. B., Teixeira, P., Eastman, A., Eastridge, B., Brown, C. V., & Davis, M. (2017). PTSD in those who care for the injured. *Injury*, *48*(2), 293–296.

42 Luo, M., Guo, L., Yu, M., Jiang, W., & Wang, H. (2020). The psychological and mental impact of coronavirus disease 2019 (COVID-19) on medical staff and general public–A systematic review and meta-analysis. *Psychiatry research*, *291*, 113190.

43 Masten, A. S. (2007). Resilience in developing systems: Progress and promise as the fourth wave rises. *Development and psychopathology*, *19*(3), 921-930.

44 K. N. M, Parashar N, Kumar CRS, Verma V, Rao S, Y. S, et al. (2021) Prevalence and severity of secondary traumatic stress and optimism in Indian health care professionals during COVID-19 lockdown. PLoS ONE 16(9): e0257429. https://doi. org/10.1371/journal.pone.0257429

45 McCain, R. S., McKinley, N., Dempster, M., Campbell, W. J., & Kirk, S. J. (2018). A study of the relationship between resilience, burnout and coping strategies in doctors. *Postgraduate medical journal*, *94*(1107), 43-47.

46 New, A. S., Fan, J., Murrough, J. W., Liu, X., Liebman, R. E., Guise, K. G., ... & Charney, D. S. (2009). A functional magnetic resonance imaging study of deliberate emotion regulation in resilience and posttraumatic stress disorder. *Biological psychiatry*, *66*(7), 656-664.

47 Ogińska-Bulik, N. (2015). Social support and negative and positive outcomes of experienced traumatic events in a group of male emergency service workers. *International Journal of Occupational Safety and Ergonomics*, *21*(2), 119-127.

48 Ogińska-Bulik, N., &Kobylarczyk, M. (2016). Association between resiliency and posttraumatic growth in firefighters: the role of stress appraisal. *International journal of occupational safety and ergonomics*, *22*(1), 40-48.

49 Orrù, G., Marzetti, F., Conversano, C., Vagheggini, G., Miccoli, M., Ciacchini, R., Panait, E., & Gemignani, A. (2021). Secondary Traumatic Stress and Burnout in HealthcareWorkers during COVID-19 Outbreak. *International journal of environmental research and public health*, *18*(1), 337. https://doi.org/10.3390/ijerph18010337

50 Palm, K. M., Polusny, M. A., & Follette, V. M. (2004). Vicarious traumatization: Potential hazards and interventions for disaster and trauma workers. *Prehospital and disaster medicine*, *19*(1), 73-78.

51 Paton, D., & Smith, L. M. (1996). Psychological trauma in critical occupations:Methodological and assessment strategies.

52 Perez, G. K., Haime, V., Jackson, V., Chittenden, E., Mehta, D. H., & Park, E. R. (2015). Promoting resiliency among palliative care clinicians: stressors, coping strategies, and training

needs. *Journal of palliative medicine*, *18*(4), 332–337. https://doi.org/10.1089/jpm.2014.0221

53 Pietrantoni, L., &Prati, G. (2009). Resilience among first responders. *Resilience among First Responders*, 1000-1019.

54 Prati, G., &Pietrantoni, L. (2010). The relation of perceived and received social support to mental health among first responders: a meta-analytic review. *Journal of Community Psychology*, *38*(3), 403-417.

55 Robertson, I. T., Cooper, C. L., Sarkar, M., & Curran, T. (2015). Resilience training in the workplace from 2003 to 2014: A systematic review. *Journal of occupational and organizational psychology*, *88*(3), 533-562.

56 Roden-Foreman, J., Bennett, M., Rainey, E., Garrett, J., Powers, M., & Warren, A. (2017). Secondary traumatic stress in emergency medicine clinicians. *Cognitive Behaviour Therapy*, *46*(6), 522-532. https://doi.org/10.1080/16506073.2017.1315612

57 Rytwinski, N., Scur, M., Feeny, N., &Youngstrom, E. (2013). The Co-Occurrence of Major Depressive Disorder Among Individuals With Posttraumatic Stress Disorder: A Meta-Analysis. *Journal Of Traumatic Stress*, *26*(3), 299-309. https://doi.org/10.1002/jts.21814

58 Siegfried, C. B. (2008). Child welfare work and secondary traumatic stress. *Child Welfare Trauma Training Toolkit: Secondary Traumatic Stress. The National Child Traumatic Stress Network. Module*, *6*.

59 Smith, B., Dalen, J., Wiggins, K., Tooley, E., Christopher, P., & Bernard, J. (2008). The brief resilience scale: Assessing the ability to bounce back. *International Journal Of Behavioral Medicine*, *15*(3), 194-200. https://doi.org/10.1080/10705500802222972

60 Stamm, B. (1995). *Secondary traumatic stress: Self-care issues for clinicians, researchers, and educators*. The Sidran Press.

61 Stevenson, A. D., Phillips, C. B., & Anderson, K. J. (2011). Resilience among doctors who work in challenging areas: a qualitative study. *British Journal of General Practice*, *61*(588), e404-e410.

62 Streb, M., Häller, P., & Michael, T. (2014). PTSD in paramedics: resilience and sense of coherence. *Behavioural and cognitive psychotherapy*, *42*(4), 452-463.

63 Tugade, M. M., Fredrickson, B. L., & Feldman Barrett, L. (2004). Psychological resilience and positive emotional granularity: Examining the benefits of positive emotions on coping and health. *Journal of personality*, *72*(6), 1161-1190.

64 Velichkovsky, B. B. (2009). Primary and secondary appraisals in measuring resilience to stress. *Psychology in Russia: State of the Art*, *2*, 539-563.

65 West, C. P., Dyrbye, L. N., Sinsky, C., Trockel, M., Tutty, M., Nedelec, L., ... &Shanafelt, T. D. (2020). Resilience and burnout among physicians and the general US working population. *JAMA network open*, *3*(7), e209385-e209385.

66 Yehuda, R. (Ed.). (1999). Risk factors for posttraumatic stress disorder (Vol. 17). American Psychiatric Pub.

67 Yu, F., Raphael, D., Mackay, L., Smith, M., & King, A. (2019). Personal and work-related factors associated with nurse resilience: A systematic review. *International journal of nursing studies*, *93*, 129-140.

68 Zimberoff, D., & Hartman, D. (2014). *Overcoming shock: Healing the traumatized mind and heart*. New Horizon Press.