RESEARCH ARTICLE

Resiliency in Firefighters: Using Photovoice to Identify Protective Factors

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ABSTRACT

Due to high levels of occupational hazards, firefighters are prone to psychological maladaptation, ranging from PTSD to burnout. However, it is not well understood why some firefighters persist in their careers while others choose to leave. In this qualitative study, photovoice as a form of digital storytelling was used to understand the factors of resiliency that may contribute to career persistence. Firefighters ($n = 7$) in a large, suburban fire department in Colorado contributed photographs and discussed the importance of their chosen photographs through individual, in-depth interviews. Using the theoretical lens of the resiliency portfolio model consisting of self-regulation, interpersonal relationships, and meaning making, analysis revealed subthemes that demonstrated firefighters' capacity for resiliency. Within self-regulation, three subthemes emerged: adrenaline activities, alcohol, and positive coping. Within interpersonal relationships, two subthemes emerged: work-family and mentoring. Within meaning making, three subthemes became apparent: helping others, legacy, and fatalism. Recommendations for fire departments to enhance the dimensions of resilience are made based on the emergent themes with an emphasis on positive coping skills and mentoring.

Keywords: Firefighters, fire service, resilience, psychological maladaptation, resilience portfolio model, interpersonal relationships, meaning-making, self-regulation.

Introduction

It has been well-established in the literature that firefighters are at high risk of psychological maladaptation. In addition to working in a field with high levels of occupational hazards, continued exposure to stress and trauma results in multiple mental health outcomes. For example, researchers have shown that firefighters are prone to burnout, compassion fatigue (CF), and vicarious trauma (VT). [1, 2, 3, 4, 5, 6, 7, 8, 9] Psychological maladaptation is concerning because approximately 54% of firefighter deaths are attributed to occupational stress. [10] In addition to cancer, heart attacks, stroke, heart disease, and overexertion, field accidents or other causes of death may actually be the result of occupational stress. [10] However, little is understood about fire fighters' resiliency factors and how they may contribute to success in the career. By understanding the factors that contribute to resiliency and what can be done by fire departments to foster those factors, departments can potentially increase retention by decreasing psychological maladaptation. In this article, we seek to answer the overarching question: How do firefighters use coping mechanisms, including self-regulation, interpersonal relationships, and meaning-making, to foster resilience? To answer this question, we used the qualitative photovoice approach to capture firefighters' experiences.

Psychological Maladaptation

Burnout is a phenomenon that occurs when there is an imbalance between work and life responsibilities. [11] Measured along six dimensions (control, workload, reward, fairness, community, and values), an imbalance results in career burnout. [11, 12] In a Photovoice study of West Virginian firefighters, Wooding et al. [13] found that the long-term stress of firefighters increased the risk of post-traumatic stress disorder (PTSD) and other disorders. Additionally, Koopmans et al. [14] and Park et al. [15] found an increase of suicidal ideation, which is especially important since firefighters are repeatedly exposed to trauma. [16]

Compassion fatigue is a stress that manifests from helping others through trauma, versus directly experiencing the trauma. [6] Baranowsky and Gentry [17] found that responders who experience CF may find themselves unable to handle daily responsibilities. Researchers have found that responders who suffer from CF are more likely to cope with negative behaviors including lack of sleep, smoking, and drinking. [1, 18, 6, 19, 20]

Resilience and Protective Factors

A common theme in the literature in understanding firefighters' response to occupational stress is resilience. Resilience is generally known to consist of both healthy functioning following trauma and also the adaptive capacities to successfully navigate adverse situations. [21] It refers to maintaining psychological health despite trauma, violence, and/or adversity. [21] To maintain psychological health, coping mechanisms are used to facilitate resiliency. Grych et al. [21] suggested a model of protective coping mechanisms consisting of three domains: self-regulation, interpersonal relationships, and meaning-making. These three domains act as a full portfolio, hence the term *resilience portfolio model*. [21]

Self-regulation occurs in the short- and long-term; people high in self-regulation can moderate their reactions to stressful situations and focus on long-term goals, such as graduating from the fire academy. [21] These factors consist of grit and self-preservation, optimism, and emotional self-regulation. [22, 23]

Interpersonal relationships refer to supportive relationships that may include spouses, family, neighbors, friends, and coworkers. [21, 23] In addition to the relationship, it also involves maintaining those relationships and support. [21, 23] Community support is an important aspect of interpersonal relationships. [21, 23]

Meaning-making is an individual's ability to understand and explain what they have experienced. [21, 23] This domain includes spirituality, religion, and secular understanding of purpose. [21, 23] Making sense of a traumatic event and placing it within a sense of self appears to be essential to resilience. [21, 23]

Method

The purpose of this study was to understand the factors that lead to resiliency in firefighters employed at a fire department located in Denver, Colorado. The present study was guided by the following overarching research question: How do firefighters use coping mechanisms, including self-regulation, interpersonal relationships, and meaning-making, to foster resilience? We used a qualitative photovoice approach to capture firefighters' experiences. Using visual representations produced by career firefighters allows researchers to have a novel way of understanding how they manage trauma and mitigate burnout. Photovoice techniques provide an ideal methodology to explore resiliency because participants share photos that are meaningful to them and their careers. This methodology provided the firefighters with ownership of their narratives rather than what would occur in a traditional interview.

The photovoice method is both participatory and action-oriented. [24] It is a qualitative method that empowers participants to generate knowledge by sharing their experiences through photography. [25, 13] Photovoice is often used by community-based participatory researchers (CBPR) because it enables participants to give them a voice to address issues important to them. [26] In preparation for this study, the primary investigator (PI) attended a multi-day photovoice training provided by the charity PhotoVoice, which conducts training to help researchers and community leaders use photovoice for self-advocacy projects, digital storytelling, and participatory photography. [27]

Using participatory photography for inquiry emerged in the early 1990s, and this newer methodology continues to grow in popularity. A core purpose of Photovoice is to give individuals visual tools of expression that can then diagnosis community-based problems that lie out of view. [24] As such, visual participatory research methods enable participants to articulate issues impacting them while allowing community stakeholders to gain new insights and generate positive change. [28] Photovoice has been used in diverse international settings and often grants power to voices that are typically marginalized and has the capability to explore community perceptions, social barriers, social determinants of health, and disparities experienced in various circumstances. [29, 30, 31, 28, 32]

Participants and Recruitment

Data collection for this study occurred in accordance with the IRB approval granted by the researchers' university. While the fire department which employed the participants did not have an IRB or similar process, the captain agreed to facilitate the request for participants with permission from the fire chief.

Purposive and snowball sampling techniques were used to recruit participants. A survey was emailed to all career firefighters ($N = 600$) in the department about the opportunity to be a part of the study. While fourteen participants initially indicated interest by providing contact details to the researchers, only two firefighters responded when asked to participate. Since the data collection occurred during the COVID-19 pandemic, firefighters were involved in additional calls and faced their own health-related absences.

One of the two firefights agreed to be included in the study and helped to recruit several of his colleagues. Another firefighter also sent the information to more of her colleagues. After repeated attempts to secure participants, we reached a sample of seven career firefighters comprised of three women and four men. This sample size falls within the recommended photovoice sample size of six to 10 participants. [33, 34] Participants' ages ranged from 29 years to the early 50s (see Table 1). All firefighters were White, and all but one was employed by the fire department when the data was collected. While the comparatively small sample drawn from one metropolitan area limits the generalizability of the findings, the experience of these firefights is likely to provide insights that will be of use to many fire service departments.

Table 1: Participant Demographics

Pseudonym	Estimated Age Group	Gender
Eddie	50s	M
Kelly	40s	F
John	50s	M
Maggie	50s	F
James	40s	M
Chris	20s	M
Tina	40s	F

Data Collection

Once participants agreed to be a part of the study, we asked each to email the PI photos that represented how they felt about their fire service career. Participants were asked to provide eight to 12 photos, and all sent a minimum of 12 photos, with several sending many times more. Following receipt of the photographs, we scheduled interviews with the participants.

The interview with the first firefighter was held in person, but due to the COVID-19 restrictions, the remaining six interviews were held by telephone. The first participant was interviewed face-to-face at a coffee shop selected by him, while the other participants completed their interviews at their preferred location, which was either at a fire station or their home. All firefighters gave informed consent as part of the interview process. They also granted permission to us to use the photographs in publications. Interviews were recorded with the iPhone Voice Memo app on two separate phones in order to enhance reliability. The shortest interview was 56 minutes, and the longest was 2 hours and 8 minutes.

With most of the interviews occurring over the telephone, establishing a rapport with the interviewees was critical. Generally, establishing rapport in face-to-face interviews involves listening and prompting, as necessary, in order to create a safe space. [35] We took extra time at the start of the interviews to assure the participants of confidentiality, anonymity, and to offer resources as

needed. To create rapport, our initial questions were general ones about their background and why they decided to become firefighters. Once these conversational questions created a friendly environment, we moved on to questions about the photos they submitted. We empowered the participants to select which photo they wanted to start discussing and the order they wanted to follow. We then engaged in an open-ended discussion of the submitted photographs. Once the photovoice interviews were completed, we uploaded them to NVivo transcription and scrubbed the interviews of filler words such as "uh" or "um."

Data Analysis

Since we used the *resilience portfolio model* as the lens to investigate how firefighters use coping mechanisms to foster resilience, we started our analysis by developing a codebook encompassing the three domains of the model: self-regulation, interpersonal relationships, and meaning-making. 21 At the suggestion of Grych, we used materials on the https://lifepathsresearch.org/ to identify keywords and themes that aligned with the domains. One researcher first reviewed Hamby et al.'s 37Life Paths Measurement Packet: Finalized Scales (Hamby et al., 2015), and then did a supplemental review of Resilience Portfolio Questionnaire Manual: Scales for Youth to cull the original list of keywords. 23 The other researchers then verified this list resulting in a codebook (See Table 2).

Table 2: Resilience Portfolio Model Codebook Key Words

Domains with Associated Key Words		
Self-Regulation	**Interpersonal Relationships**	**Meaning-Making**
Anger	Attachment	Care
Coping	Maternal	Moral
Endurance	Paternal	Optimism
Emotional	Romantic	Purpose
Regulation	Compassion	Religious
Honesty	Community support	Future
Impulse control	Forgiveness	Mattering
Recovering	Generativity	
Self-reliance	Generous	
	Relationship	
	Social support	
	Integration	
	Connectedness	

The PI used NVivo to code the interviews based on the codebook. After an initial review of the transcripts, deductive coding was used on a line-by-line base with the unit of analysis at the sentence or longer passage as appropriate for each interview. This process resulted in a number of subthemes revealing themselves in each of the three main domains. By starting with a codebook and allowing for additional themes to emerge from the data, we employed a flexible coding approach appropriate for in-depth interviews. 38 This allowed us to explore how additional elements of the *resilience portfolio model* might appear in a sample of firefighters.

Once the PI completed the first set of coded documents, the other researcher reviewed the codes to enhance validity. There were also discussions about how some of the domains of the resilience portfolio overlapped and where a newly identified subtheme belonged. Once agreement was reached, several subthemes emerged from each of the three dimensions. Within the self-regulation domain, three subthemes emerged: adrenaline activities, alcohol, and positive coping. Within the interpersonal relationships domain, two subthemes emerged: work-family and mentoring. Within the meaning making domain, three subthemes became apparent: helping others, legacy, and fatalism. See Table 3 and discussion below.

Validity

To ensure validity in qualitative research, the structure of the data collection and analysis needs to be appropriate for the research question.

39 The photovoice methodology used in this study gave participants their own voice. They owned their photos and had autonomous control over when, where, and why they took each photo and controlled what photos they submitted for the study. 13 The interviews conducted by the researchers were controlled by the participants as they chose the order of their photographs, had the ability to omit photographs from the interviews, and led the discussion. To collect the needed rich data for analysis, the researchers asked probing follow-up questions to collect additional specifics about the emotions associated with a career in the fire service. The participants were fully engaged in the interviews and wanted to share their experiences to improve the understanding of how policies and programs could help support firefighters.

A variety of techniques were used to address internal validity. With a two-person research team, we were able to increase validity through the convergence of different viewpoints in the analysis. 40 We met regularly to discuss the interview coding to determine if we agreed about how the codebook was applied and if the emergent subthemes were appropriate. Guion 41 noted that when investigators arrive at the same conclusion, then the results should be considered credible (investigator triangulation).

To increase internal validity, we practiced reflexivity to help eliminate bias. 42, 43 The interviews were done by one of the researchers and a research assistant. The researcher used to work for a nonprofit that partnered with firefighters and other emergency services and the assistant is married to a former military-turned-police officer. Both bracketed these backgrounds during the data collection process. The second researcher who became involved in the project at the point of data analysis has no personal or professional connection to the fire service or any other similar organization. This external viewpoint helped to ensure that any remaining personal biases of the other researchers were not present in the coding process and help to ensure that neutrality was driving the coding process to ensure validity. 39

Triangulation also increases internal validity and can include collecting data from two or more sources. 39, 44, 45, 46 By including data from seven participants, we compared multiple perspectives for convergency or divergence. 44 The use of triangulation also helps to mitigate researcher bias. The responses from the seven participants often converged in each of the three domains, and the subthemes identified in this study emerged from multiple sources, guiding the identification of the themes and subthemes.

We were able to achieve saturation after seven interviews since no new data emerged from the in-depth interviews. Data saturation is achieved once any new data is a repeat of data already collected. 47 The interviews lasted nearly an hour to two hours long and provided extensive data that captured how the participants practiced resiliency.

During the analysis, we used a deductive coding approach and developed a keyword codebook based on the *resilience portfolio model*. The codebook was developed by one of the researchers and then verified by the other one. As recommended by Coleman 39, the interviews were captured via digital audio recordings to ensure the accuracy of the resultant written transcriptions, which were reviewed by the researchers.

We used NVivo to code the data and a mechanism to identify and track emergent sub-themes. Using computer-assisted qualitative data analysis software helps to demonstrate objectivity in the data analysis process. 38 The initial coding done by the PI was reviewed and modified as appropriate by the other researcher, providing the needed peer review of the analysis as recommended by Coleman 39. Once the coding was complete, we searched for supportive quotations for each sub-theme.

Results

The firefighters were asked to submit photos that represented their career. Respondents submitted pictures of car accidents, school shootings, house fires, wildfires, and fatalities. A recurring topic was of a beloved fire chief who passed away from cancer in 2019. Participants also mentioned times when their own lives were in danger or in perceived danger. All of the participants noted that their jobs were high-stress but that they had found ways to cope with the stress. Using the lens of the resiliency portfolio model, we were able to identify the coping mechanisms used by firefighters: self-regulation, interpersonal relationships, and meaning-making. 21

From the participant-led open-ended interviews, themes presented that aligned with the resilience portfolio model. 21 Grych et al. 21 identified three domains of resiliency: interpersonal relationships, meaning-making, and self-regulation. The interviews suggested that firefighters dealt with career adversity through these three dimensions which we were able to break down into subthemes. See Table 3.

Table 3: Resilience Portfolio Dimensions and Subthemes

Resilience Portfolio Dimension	Subtheme 1	Subtheme 2	Subtheme 3
Self-Regulation	Coping Mechanisms	Alcohol	Adrenaline Activities
Interpersonal Relationships	Work Family	Mentoring/Support	
Meaning-Making	Helping	Legacy	Fatalism

Self-regulation

Self-regulation consists of factors that contribute to self-preservation. 22 These factors can include optimism and emotional self-regulation. 23 Key words from the Life-Paths Measurement Packet included coping, anger, impulse control, recovering, and self-reliance. From our interviews, we identified three subthemes that indicated self-regulation: positive coping mechanisms, alcohol, and adrenaline activities.

Positive Coping Mechanisms

Participants recognized that they worked in a high-stress career. All the firefighters discussed ways they developed to reduce the impact of stress. John had become a proponent of meditation as a coping mechanism. He said he found meditation an effective way to practice mindfulness and suggested that every person who worked in emergency services should develop meditation practices. Kelly spoke about her seeking nature and skiing or hiking to release stress. Several participants also mentioned they had chosen to seek out private therapy to help mitigate stress. After a traumatic car accident, John began seeing a therapist and completing EDMR therapy. While in the fire service, Maggie did not seek counseling because she was afraid, she would be seen as "weak," but after her abrupt retirement, she now regularly sees a therapist who specializes in veterans and emergency management personnel who experience trauma. While Tina did not mention that she was actively seeking counseling, she regularly reads self-help books and looks for spiritual guidance. She said that she had recently read that "morale is tied in with longevity and the ability to push through when things get hard and to stay present [in the moment]."

Alcohol

A negative coping mechanism often mentioned was the use and abuse of alcohol. Alcohol was often seen as a social activity (going out for a beer after a shift), but several participants admitted to addiction issues. John discussed a very public funeral for a sheriff's deputy where he was a photographer; he said the funeral was a turning point for him and how he handled his job: "I was struggling with alcohol… And I remember leaving [the funeral] just feeling numb and just feeling empty inside." He said that he was using alcohol to numb instead of relax and decided to quit drinking. He has now been sober for over 2 years. He said that many of his colleagues struggle with alcohol, mentioning that they will say they cannot wait until their shift is over so they can have a drink. Maggie, who has retired from the fire service, confessed to resorting to drinking to cope with the stress of her job. After two divorces and raising triplets, Maggie stated that she would come home and drink. She said that drinking at home was a way to "just decompress," but she recognized that it was not a healthy way to cope. Eddie also noted that many of his colleagues struggled with addiction and said that he was working with the department to provide resources and help.

Adrenaline Activities

All the participants mentioned activities that they pursued in their spare time that provided an adrenaline rush. In addition to regularly working out, John is a storm chaser, seeking out tornadoes to photograph. Chris, before joining the fire service, bicycled across the country, raising money for fallen firefighters. After being hired, he prides himself on his fitness abilities and being fitter than nonfirefighter peers. Maggie, who has left the service, is an avid skier and pushed herself to outperform her male colleagues. She prides herself that in the fire academy, she placed 1st out of 13 cadets, and she was the only female in the class. Tina, who is still in the fire service, recounted times of near-death experience. She had sepsis when she was 12, flipped a paddleboard and almost drowned as a teenager, had a rock-climbing accident and fell fifty feet as a young adult, and yet she continues to seek out adventures that give her an adrenaline burst. She is an avid motorcyclist and enjoys boating and other physical activities. Eddie, who was the oldest of the respondents at over 50 years of age, prided himself on still being able to run 6-minute miles and compared himself to Marines and their fitness levels.

Photo 1: Adrenaline Activities

Interpersonal relationships

Interpersonal relationships are supportive relationships that may include spouses, family, neighbors, friends, and coworkers. 21, 23 In addition to having the relationship, the relationship also involves the process of maintaining those relationships and support. 21, 23 Key words from the Life-Paths Measurement Packet included relationships, connectedness, and social support. From our interviews, we identified two subthemes: work-family and mentoring/support, both as potential positive coping mechanisms related to resiliency.

Work-family

During the interviews, all the firefighters referred to their work families as sources of how they navigated the stressful times. Each participant noted how work colleagues supported them by listening or providing humor during and after trauma. Kelly shared, "it's a lot of fun to run calls and feel like you're really making a difference and you're not pushing a desk and counting every hour that you're at work. You're with this community, the second family that you have." Maggie, who has left the fire service due to self-admitted burnout and panic attacks, attributed part of her decision to leave the service because she never made the interpersonal connections other participants had: "when you pick a station and you have a station for much of your career, you become a family there

and you do things together and you know how the other people in your station work. But I never really had a lot of that. So, I mean, it was good and bad. I got to meet a lot of different people and see different personalities. But I also never had that closeness and that family component that I think would have made my career last longer."

However, several participants also noted that their stressful jobs and difficult schedules caused problems with maintaining interpersonal relationships. John, who has served in many different jobs within the fire department and who currently is the department photographer, said, "it [the job] makes having a social life a bit of a challenge. You know, specifically dating and meeting people." Other respondents referenced their divorces and how their job may have led to infidelity or poor relationships. James, during the interview, revealed that his wife was moving out of the house and that she had cheated with a law enforcement officer. In fact, he mentioned, this was going to be his second divorce and both times his wife had had an affair with a police officer. He stated that the hard hours he worked and the amount of trauma and stress he experienced contributed to his wives' infidelities because "[those] factors contribute to difficult times with relationships." Maggie agreed and said it was even harder for women in the fire service to remain married: "[divorce is] higher among women in the fire service because typically your spouse doesn't

care for that or doesn't like that. You know, that you're hanging out with a bunch of guys."

Mentoring/support

The other commonly referenced theme within interpersonal relationships was peer mentoring and company support. All of the firefighters, except for Maggie, discussed peers who acted as mentors during tough times. These peer mentors were informal support systems; they were colleagues who became friends. In most cases, the peer mentors were senior firefighters who had helped the respondents learn how to navigate their careers. James shared about one senior colleague: "[h]e was one of several people on this department that really kind of took me under his wing from the time that I was a little kid all the way through my career. And he had a fantastic experience and advice. I think what made me so successful in my career and led to the promotions that I got was really his guidance and helping to develop me." Other participants, including John and Eddie, prided themselves on becoming mentors themselves, recognizing that they had the opportunity to change others' lives. Maggie, who left the service, noted that the lack of mentoring contributed to her burnout: "I didn't really ever have anybody in particular that kind of took me under their wing and said . . .I'm going to help you or if you have concerns, come talk to me." It was evident that mentoring is a powerful form of interpersonal relationships that, when present, acts as an element of resilience.

Photo 2: Interpersonal Relationships

Meaning-Making

The third dimension of the portfolio of resilience is *meaning-making*. According to Grych et al. 21 and Hamby et al. 23, an important aspect of resilience is the ability to make meaning from trauma. Within meaning-making terms include religion, spirituality, and secular understanding of purpose. 21, 23 Within the photovoice interviews, three subthemes emerged that related to meaning-making: helping others, legacy, and fatalism.

Helping Others

Firefighting is a helping profession. The participants in the study all identified times in their jobs where they gained satisfaction from helping others. The *helping* came from saving an infant from drowning (Chris), rescuing people from a housefire (John), responding to a wildfire (Tina) or extracting victims from car accidents (Eddie, John). Maggie, who had retired from the service, remembered that the positive from the job was helping other people and that the role of helping acted "therapeutically." James summed it up well: "I think deep down, [firefighters] really enjoy helping people and solving problems." John said that it was the helping of others that acted "super fulfilling." Regardless of the trauma experienced, every participant mentioned that the idea of helping others is what drove them to their career and what provided meaning to their days.
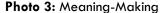
Legacy

Another subtheme that presented among several of the participants was the idea of

continuing a legacy of serving in the emergency services. James shared that his father had been a volunteer with the American Red Cross and that he had been exposed to house fires as a child when his father would take him along to calls. Chris's father had been a firefighter and he credits his father with exposing him to the field and encouraging him to become a responder himself. John specifically mentioned legacy: "just from a kind of a legacy standpoint, it feels good to give back and it feels good to be able to offer support to our tradition." John saw himself as a conduit for continuing service to the community and hoped to inspire others to join the field. Kelly, as a female firefighter, hoped to inspire other girls to join the fire service. She said, "girls look at me and they are intrigued [by the career]."

Fatalism

The third subtheme that emerged from the coding was what we termed *fatalism*. Several firefighters mentioned that they saw Mother Nature as in control. They recognized beauty in the fires and trauma they witnessed, understood that their job was to mitigate the effects, but that in the end, the result of a fire or trauma was out of their hands. James shared a picture of a grasslands fire and said, "[that the fire was] just an amazing display of Mother Nature and what Mother Nature can do with flames." Tina recognized that her job had inherent risks, from cancer to dying in a fire to contracting COVID and felt that those risks were out of her control. She said that she could give into the fear, but that she rather "try to find the joy." Eddie believes that a major factor in firefighter burnout is the fact that many firefighters come to the realization that much of their career is out of their control: "what burns people out the most is when we see something needs to change and we don't have the ability to change it." Interestingly, several of the firefighters sought out Nature as a source of solace: John uses a place near his home as a meditation spot and Kelly regularly drives to the top of a local mountain to find peace. She said, "[at the mountain], nobody wants anything from you."

Photo 3: Meaning-Making

Discussion

The photovoice interviews indicated that successful firefighters demonstrate traits that fall within the dimensions of the resilience portfolio model. 21 Firefighters who persist in their careers show the ability to maintain interpersonal relationships, create meaning-making, and self-regulate. The respondent who did not persist in her career specifically lacked interpersonal relationships, thus highlighting the importance of creating and maintaining relationships with others. Self-regulation appears to be an important aspect in maintaining the resiliency of firefighters. Within our research, we found that respondents developed self-regulation by creating coping mechanisms, the use and abuse of alcohol, and pursuing adrenaline activities. Several firefighters sought therapy, both individually and through the department, recognizing the importance of releasing stress from their careers. Several participants also mentioned alcohol as a way they had managed stress, with one respondent admitting that he was an alcoholic and now in recovery. All respondents mentioned activities ranging from workouts to motorcycle riding as ways also to regulate their responses to stress and trauma.

These findings align with other studies that examined self-regulation as an individual factor of resiliency. Yule et al. 48 noted that self-regulation is a key indicator of whether someone will be able to demonstrate resiliency after trauma. Garber 49 suggested that self-regulation consists of the ways individuals manage emotions in order to achieve a goal. Perseverance and grit are critical components of self-regulation. 23 From this study, firefighters who practiced positive self-regulation such as therapy and spirituality and then ways to pursue physical activities were successful in their careers

and managing exposure to trauma and stress. However, the use of alcohol is a concern. According to our respondents, drinking is a part of the firefighting culture and is often seen as a way to decompress. However, addiction is a concern and should be considered by departments. One of our respondents who admitted to alcohol abuse went into recovery and has thus persevered in his career. The respondent who accepted her use of alcohol as a coping mechanism has left the field altogether.

The second dimension of resiliency, interpersonal relationships, was also very important to our respondents. Firefighters saw their stations and coworkers as a family, getting to know their personal lives, choosing to spend free time with them, and looking out for one another. In some cases, the work family dynamic substituted for personal relationships outside of the firehouse. Several participants mentioned that their career contributed to their divorces; in their cases, their spouses were not sympathetic to the demands of the fire station. Work-family conflict is a variable of interest in studies. Griffin et al. 50 studied work-family conflict among police officers and found that resiliency helped moderate this conflict. This topic has also been studied among nurses 51, 52, teachers 53, and public safety personnel 54, among other fields. However, the research in this area with regards to firefighters is more limited. Smith et al. 4 and Wu et al. 55 both have examined work-family conflict with regards to burnout, but more research is needed to understand how a fire station acts as a family and may substitute for a personal one.

Mentoring continues to be an important element of interpersonal relationships. This is especially evident with Maggie who lacked a mentor and also left the fire service. Earlier studies have explored the need for mentoring as a support for firefighters. For example, Maynard-Patrick and Baugh 56 examined the reciprocity of mentoring and Dunlap 57 and Eriksen et al. 58 found that mentoring was especially important for women. A prior study also emphasized mentoring as an important element for firefighters. 9 However, through the lens of the resilience portfolio, mentoring clearly becomes an essential part of interpersonal relationships, and departments should consider ways to grow mentoring, whether by peers, senior colleagues, or other forms.

The last dimension of resiliency, meaning-making, manifested through three subthemes: helping others, legacy, and fatalism. Meaning-making as a resiliency factor among firefighters has been studied very limitedly in the existing literature. Blaney et al. 59 examined resiliency among volunteer firefighters and found that participants found meaning by saying that they did the best they could, even if the outcomes were not desirable. This is similar to the findings here; firefighters recognized that the calls they responded to were difficult, but they found hope by helping others. 60 The concept of helping others as a resiliency factor should be studied further in the literature. How do firefighters cope with trauma knowing that they have helped, or perhaps did not, others?

We also found that our participants were proud to either continue a legacy or to inspire a legacy in the fire service. According to Grych et al. 21, purpose is an important part of meaning-making. For several respondents, they saw themselves as continuing a legacy of service from their fathers or a close mentor. Another respondent believed that she could inspire a legacy of service among girls. The construct of continuing a legacy does not appear to be part of the extant literature. However, this theme was important for several of our participants; the idea of continuing a tradition drew them to the field and sustained them even during times of crisis. More research is needed in this area.

Finally, several firefighters believed that in the end, Mother Nature was in control of the fire or situation, what we termed *fatalism*. They saw that even with their best efforts, the outcome of a fire (or other incident) was ultimately out of their hands. This is also an area that is not well-understood in the literature. Ricciardelli et al. 61 examined Canadian public safety personnel and found that respondents had fatalistic attitudes, but that they placed blame on the government or external agencies, not on nature. Smith et al. 62 found that United Kingdom healthcare workers employed a fatalistic attitude towards COVID-19. There does not appear to be any research exploring fatalism among firefighters and this should be an area of further research.

The research question we sought to address in this study was how firefighters used coping mechanisms to foster resilience. We used Grych et al. 21 factors of self-regulation, interpersonal relationship, and meaning-making to conduct a thematic analysis of how firefighters felt about their service. Our findings extend several threads of literature on resiliency among firefighters related to the factors we studied. However, we also identified new themes to consider when managing burnout among firefighters. Specifically, alcohol may be overused as a self-regulation tool, which could lead to negative consequences. The importance of coworkers and mentoring opportunities allows firefighters to strengthen their interpersonal relationships to help promote resiliency. Finally, the sense of legacy of service as well as fatalism in

regard to Mother Nature provides the needed coping meaning-making framework.

Limitations and Recommendations

There are limitations in the present study. The participants were all career firefighters and all White. The experience of volunteer firefighters may also be different from our sample. Additionally, resiliency may be experienced differently by more diverse departments. Because the data was collected during the COVID-19 lockdowns, six of the seven interviews were held over the phone. While we worked hard to establish rapport verbally, rapport may have been stronger if the interviews had been held in person. We believe, however, that the outcomes of the photovoice interviews provided unique insights into how firefighters developed and maintained resiliency.

Further researchers should consider how firefighters sustain and develop the three dimensions of resiliency. There is little understood about how responders maintain interpersonal relationships, especially in the light of work-life conflict and balance. Additionally, while firefighters often develop positive self-regulation, such as doing therapy or seeking spirituality, they may find themselves using alcohol as a coping mechanism. Furthermore, little is known how firefighters develop meaning; from the concept of helping others, to sustaining a legacy, to fatalism, there is a dearth of current literature.

From our findings, we also make specific recommendations for departments to consider helping firefighters be resilient and persist in their careers. Department leaders should consider ways to implement supportive programs that encompass the three domains associated with resilience: self-regulation, interpersonal relationships, and meaning-making. Self-regulation involves allowing people to handle anger, find ways to recover from trauma, and enable coping (Grych et al., 2015). Departments can work on destigmatizing therapy and ensure that therapists and counselors are readily available for responders. Additionally, departments should be aware of the signs of alcoholism and enable access to treatment for those

who are abusing alcohol or drugs. Additionally, we saw that the responders who were successful in their careers found themselves in strong mentoring roles or being mentored themselves. The respondent who did not persist in her career lacked the mentoring she felt she needed to be successful. Departments should consider how they can facilitate mentoring in various forms among their firefighters.

One interesting subtheme that emerged was that the stations acted as surrogate families for firefighters. While more research is needed in this area, especially concerning work-life balance and conflict, approaching dynamics in stations through the lens of family may provide support for firefighters. Finally, departments should consider how firefighters assign meaning to their work. From rewarding responders for helping others to enabling a sense of control over their work, departments can facilitate stronger resiliency, thus career persistence, among firefighters.

Conclusion

Being a firefighter has a detrimental impact on the health of those who serve their communities. 10 To better protect those who commit their careers in service and community residents, understanding the factors that help protect firefighters from CF and VT is critical. Promoting positive coping mechanisms and helping to alter harmful coping mechanisms is one way to help develop programs and policies that foster resilience. The findings from this study provide insights into what factors should be emphasized in promoting positive resilience to help increase retention.

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