



ORIGINAL ARTICLE

Firefighters' Perceptions of Psychological Intervention Programs in South Korea during the COVID-19 Pandemic

Kwak, Minyeong¹ · Im, Mihae²

¹Assistant Professor, Department of Nursing, Kyungsoo University, Busan, Korea

²Assistant Professor, Department of Nursing, Choonhae College of Health Sciences, Ulsan, Korea

Purpose: Firefighters belong to an occupational group that is consistently exposed to psychological challenges, such as post-traumatic stress disorder (PTSD). This study examines firefighters' perceptions of psychological intervention programs. **Methods:** Semi-structured interviews were conducted with 12 firefighters who were divided into two focus groups. Qualitative data were analyzed using content analysis. **Results:** Six barriers and seven suggestions regarding psychological intervention programs were identified. The barriers were "work overload", "uncomfortable counseling situation", "perfunctory programs", "lack of consulting specialists", "limited number of participants", and "lack of replacement workers while attending the intervention programs". Suggestions to overcome these barriers included developing "sustainable" and "highly accessible" intervention programs "focused on positive aspects of traumatic events", considering "job characteristics" and "individual psychosocial characteristics", as well as employing "experts with knowledge of firefighters' duties", and "creating a supportive work environment for psychological intervention". **Conclusion:** Based on these findings, the interventions should focus on the positive aspects of traumatic events, with flexibility and practicality, tailored to the individual and occupational characteristics of firefighters.

Key Words: Firefighters; Focus group; Interview; Post-traumatic stress disorder; Psychological intervention

INTRODUCTION

The consequences of a major disaster are not restricted to individual suffering but affect families and communities and cause national crises [1]. Firefighters who are first responders in disasters not only experience direct trauma related to injuries and life threats but are also vulnerable to surrogate trauma [2]. In addition, they experience urgency and danger, intense working conditions, such as waiting for dispatch 24 hours a day. As a result, they experience psychological difficulties working while experiencing mental stress due to co-workers' accidents and danger to their own lives [3]. Moreover, they repeatedly exposed to field work even if they experience psychological difficulties after traumatic event [2].

Firefighters are at high risk for mental health problems, including post-traumatic stress disorder (PTSD), depression, and alcohol abuse. As a result of Korean firefighters who received hospital treatment in 2016 and 2020, the number of firefighters suffering from depression nearly doubled from 364 in 2016 to 650 in 2020. There has also been a steady increase in the number of firefighters who have visited hospitals with PTSD symptoms, from 37 in 2016 to 67 in 2020[4]. In the study of scoping review on prevalence of PTSD among firefighters, it was found that the prevalence rates of PTSD symptoms in firefighters also vary from 6.5% to 37%[5]. Mental health issues in firefighters cause workplace injuries, family and co-worker conflicts, absenteeism, and turnover, which affect their work performance [6]. Additionally, the individual prob-

Corresponding author: Im, Mihae <https://orcid.org/0000-0002-3795-5201>

Department of Nursing, Choonhae College of Health Science, 9 Daehak-gil, Ungchon-myeon, Ulju-gun, Ulsan 44965, Korea.
Tel: +82-52-270-0216, Fax: +82-52-270-0189, E-mail: mihae1219@gmail.com

- This study was supported by a National Research Foundation of Korea (NRF) grant funded by Korean government (MSIT, No. NRF-2020R1G1A1010619).

Received: Jan 9, 2022 | Revised: Apr 27, 2022 | Accepted: May 2, 2022

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

lems of firefighters are directly related to socioeconomic losses [6,7]. However psychological difficulties are unavoidable for firefighters. As a result, it is very important to provide interventions to assist firefighters in overcoming trauma, leading to positive changes after traumatic experiences [2,3,6].

Several diverse psychological interventions are available currently that recognize the importance of mental health management for firefighters [2,6]. Most of them are interventions based on cognitive and behavioral theories, such as mindfulness therapy, acceptance commitment therapy, and emotional freedom technique [6]. Education, counseling, group therapy such as forest healing camp and music therapy are also provided [8,9]. However, most studies have developed generic interventions without accounting for firefighters' length of service, position, or job characteristics [6]. Even if a firefighter is exposed to the same traumatic event, the prognosis is different depending on the function and location [10], and the primary complaint varies according to the period after the traumatic event [11]. Therefore, psychological interventions for firefighters should consider their trauma-related characteristics and job characteristics.

Psychological interventions for most firefighters in Korea to date have developed and standardized general interventions rather than targeted interventions. In particular, although the Fire Psychology Support Center has been in operation since 2015, effective intervention studies based on understanding of fire officials' duties, trauma characteristics are insufficient, and absence of systematic manuals lead to regional inequality [6]. Moreover, given the hierarchical work culture, existing psychological support services cannot be used freely [12]. Based on these points, it was felt that it was urgent to understand the perception and the demand for psychological intervention of firefighters. However, there have been few prior qualitative studies on firefighters' experiences or perceptions of psychological intervention programs. Therefore, existing research alone is not sufficient to determine the psychological intervention programs needed for firefighters.

Following the COVID-19 pandemic, firefighters are frontline workers who respond to transportation and treat sick patients. This has caused firefighters to fear exposure to COVID-19, which increases the stress on firefighters at work [13]. As a result of the analysis of the national health survey of firefighters in 2021, 5.7% of those suffering from PTSD and 4.4% of firefighters with depressive symptoms were confirmed, which was a slight increase compared to last year. This is interpreted to have been influenced by the increased burden of additional work such as field visits

due to the spread of COVID-19 [14]. It is clear that the COVID-19 situation affected the psychological state of firefighters.

The focus group interview is an appropriate methodology for needs assessment and perceptions research. Focus groups can be used to determine program direction or needs, before beginning the program. The focus groups provide a wider range of information to the interview that participants' ideas continue to build on themselves and create synergy, giving way to the unexpected, frankly [15]. Focus group interviews go a lot further in allowing for candor not found in individual interviews. This is because focus group participants are mutually empowering and share different opinions [16]. Therefore, this study attempted to grasp the perception of firefighters on psychological intervention programs during the COVID-19 Pandemic using focus group interview. The findings of this study are expected to lay the foundation for the development of psychological intervention programs for firefighters.

METHODS

1. Study Design

This study is a qualitative study that uses the Focus Group Interview (FGI) method to explore firefighters' perceptions of the psychological intervention programs. FGI is a suitable research method for this study as it provides detailed information about participants' experiences, perceptions, opinions, emotions, and knowledge based on an interview guide composed of open-ended questions [17].

2. Participants

Twelve firefighters working at fire stations in Busan and Gyeongnam, South Korea, were included in this study. The participants were divided into two focus groups using judgment sampling. Firefighters with trauma experience who have performed emergency medical services for more than 3 years ($n=6$) and firefighters with more than 1 year of experience in psychological support related work ($n=6$) were selected. This selection criterion is based on a previous study, according to which post-traumatic stress is the most severe among firefighters engaged in rescue work in South Korea [18]. In addition, according to Gulliver et al. [19], firefighters frequently experience potential traumatic events during the first 3 years of their career. In order to maintain homogeneity by focus group, subjects were classified into similar positions and ages. To conduct

more efficient research, the interview was conducted by dividing into two groups, referring to the previous study that 80% of all themes were discoverable within two to three focus groups [20] (Table 1).

3. Data Collection

Data were collected through semi structured FGIs between April 1~25, 2021. The interviews were conducted in accordance with the procedures of the focus group research method, that is, by clarifying that the purpose of the research would not deviate from the research question. A preliminary questionnaire was created based on previous research [6]. Subsequently, two professors and one firefighter reviewed the appropriateness of the preliminary questionnaire, and a final questionnaire was drafted (Table 2).

Interviews were conducted at the study cafe, in compliance with the COVID-19 quarantine rules. Interviewees were telephonically contacted and given verbal explanations outlining the purpose and process of the study. Subsequently, written consent was obtained just before the interview. After obtaining consent from the participants to record the interview proceedings, their personal information such as age, position, work experience, field of work, and current work duration were obtained. Semi structured, open-ended questions were delivered by a facilitator during the interviews. The average duration of interviews per session was approximately 2~3 hours. The interview process and content were recorded in the field notes. Following the interview, a gift was given to each participant.

A moderator and an observer—with experience in firefighter psychological counseling and FGI research—conducted the interviews. When responses from participants were vague and insufficient for the topic presented, the moderator asked additional questions for obtaining more specific answers. One observer recorded the interviews and took field notes to understand the atmosphere of the group and non-verbal communication during the interview. After performing FGI of one group, analysis was performed immediately. After that, FGI of the other group was carried out to constantly check the saturation status of the study.

4. Data analysis

The data analysis in this study was conducted based on following process of inductive content analysis suggested by Elo and Kyngas [17]: (1) overall understanding of the

Table 1. General Characteristics of Participants

Group	ID	Sex	Age (year)	Position	Field of work	Working experience		Working experience in current field	
						Year	M±SD	Year	M±SD
Group 1	Participant A	F	29	Firefighter Senior	Emergency medical services	3	5.00±2.68	3	2.92±1.86
	Participant B	M	35	fire sergeant	Emergency medical services	6		6	
	Participant C	M	31	Firefighter Senior	Emergency medical services	4		4	
	Participant D	M	28	fire sergeant Fire	Administration	3		1.5	
	Participant E	M	31	sergeant	Administration	4		1	
	Participant F	F	39	Fire sergeant	Administration	10		2	
Group 2	Participant G	M	31	Firefighter	Emergency medical services	3	6.92±4.52	3	3.42±3.32
	Participant H	F	31	Firefighter	Emergency medical services	3		3	
	Participant I	M	39	Fire sergeant	Emergency medical services	10		10	
	Participant J	M	39	Fire sergeant	Administration	12		1	
	Participant K	M	39	Fire sergeant	Administration	11		2	
	Participant L	M	27	Firefighter	Administration	2.5		1.5	

F=female; M=male; SD=standard deviation.

Table 2. Open-ended Question for FGI

Category	Contents	Question
Opening questions	Recent traumatic events and associated psychological difficulties	What traumatic events and related psychological challenges have you experienced lately?
Introductory questions	How to deal with psychological difficulties after experiencing a traumatic event	How do you resolve psychological difficulties once you have experienced traumatic events?
Transition questions	Current status of the trauma programs for firefighters	What is the structure (number of programs, time, and method) and content of the programs currently addressing the post-traumatic psychological difficulties of firefighters?
Key questions	Effective program operational plan	In your opinion, what is the most efficient operational plan for the implementation of the psychological intervention program?
	Points to note, taking into consideration the characteristics of firefighting work	What do you think are the important points when considering the characteristics of firefighting operations in order to make the psychological intervention for firefighters effective?
Ending questions	Other related queries	Are you referring to anything other than the psychological intervention program for firefighters that we have discussed so far?

data and confirmation of key statements, (2) open coding, and (3) category creation and abstraction. First, the two researchers were given time to become familiar with the data collected by repeatedly reading the data transcribed independently. Then, the key statements and expressions of the participants who contributed to conceptualization were highlighted. After that, open coding was performed through line by line analysis. In addition, when having a meeting, the extracted words and phrases were grouped together, and those related to each other were categorized. In this process, the consistency of coding vocabulary and similarities and differences in expression was also examined. Since then, each detailed code has been grouped and classified into sub-categories. The main statements, types, and attributes of the sub-category were identified, and abstraction and process were performed in a more comprehensive upper category.

The preparation of the researcher to carry out this study is as follows. The two researchers regularly attended courses on qualitative research during their doctoral studies. Both researchers experience with qualitative research. In addition, ongoing participation in qualitative research workshops was intended to increase understanding of qualitative research as a whole.

5. Trustworthiness of the Study

The validity of the study was assessed through the qual-

itative research evaluation criteria proposed by Lincoln and Guba [21], focusing on credibility, transferability, dependability, and confirmability. To ensure the credibility of the study results, the questions that could induce the participants to make a statement were excluded, allowing them to freely express their thoughts. Researcher subjectivity and bias were avoided as much as possible. To ensure transferability, meaningful concepts, sentences, and categories were extracted using the oral content of the participants as they were. Dependability and confirmability were ensured by revising the results of the data analysis several times. Additionally, the interview questions and research objectives were briefed in advance before the study began, so the starting point for data collection was the same. Efforts have been made to exclude the experiences of individual researchers and the content of past studies from all research questions. Furthermore, all research procedures, including the data collection stage and the analysis process, were documented. In addition, the interview transcriptions of each focus group participant were checked by two individuals to ensure that the results of the analysis reflected the interview.

6. Ethical Consideration

This study was reviewed and approved by the Institutional Review Board of K University (IRB No. 40525-201404-HR-26-02). All participants were informed about the pur-

pose of the study, research process, confidentiality, and the right to withdraw from participation at any time. Additionally, prior to starting the interview, participants' consent was obtained after explaining that the recordings would be used for research purposes only and would be destroyed at the end of the study. The recorded interview contents were transcribed using a computer program, all personal information related to the participants' identity was deleted, and a separate identification number was assigned to each participant.

RESULTS

As a result of FGI with firefighters, considering their perceptions of psychological intervention programs, barriers and suggestions were identified as a category. There were 6 sub-categories as barriers implementing psychological intervention programs for firefighters: work overload, uncomfortable counseling situation, perfunctory programs, lack of consulting specialists, limited number of participants, and lack of replacement workers while attending intervention programs. To facilitate psychological intervention programs, 7 sub-categories as suggestions were identified: programs focused on positive aspects of

traumatic events, programs considering job characteristics, programs considering individual psychological characteristics, developing sustainable programs, appointing experts with knowledge of firefighting duties, developing highly accessible programs using various materials and creating a supportive environment for psychological programs (Figure 1).

1. Barriers

1) Work overload

The quarantine measures related to the COVID-19 pandemic have put additional work pressure on firefighters, leaving them with little time to participate in psychological intervention programs.

Because of additional work related to COVID-19, everyone is physically overwhelmed; so, I cannot allow myself to participate in such psychological programs. (FGI1, Participant B)

There are a lot of other things besides emergency medical services, such as watering street trees, the firefighting experiment program for kids, and computer work. Therefore, I cannot afford to participate

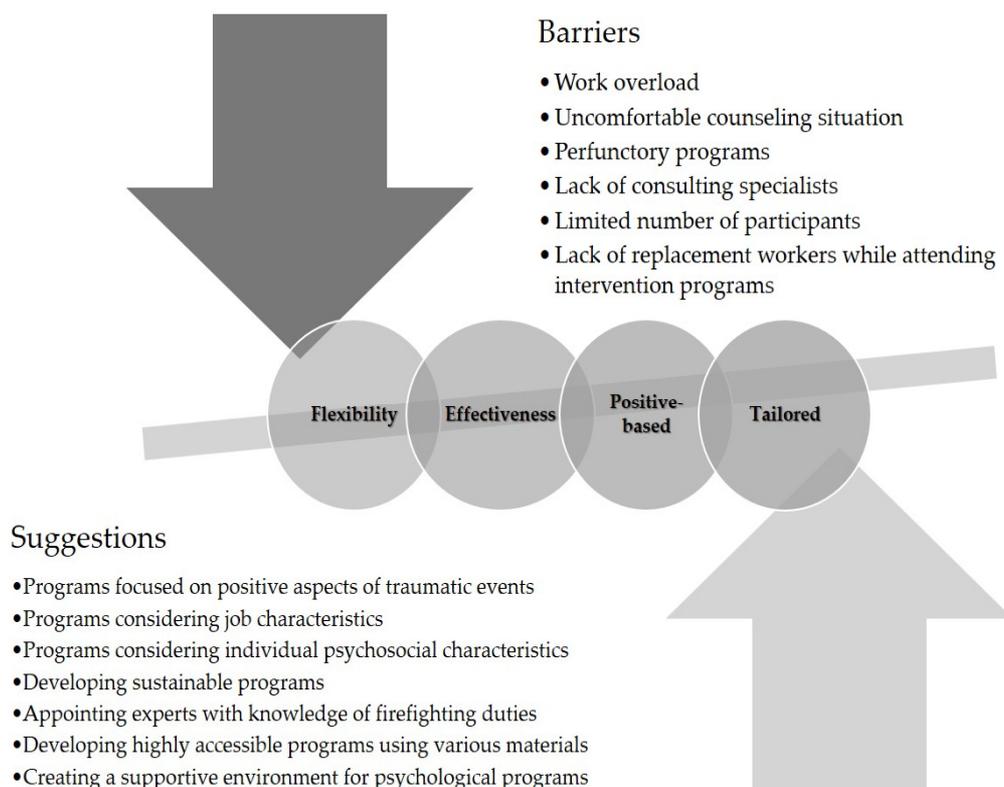


Figure 1. Firefighters' perceptions of psychological intervention programs.

in intervention programs.(FGI2, Participant G)

2) Uncomfortable counseling situation

Most psychological intervention programs are conducted at the fire department. As a result, firefighters' participation in the program becomes noticeable, and they find it difficult to concentrate.

I'm doing consultations in the middle of work; so I don't know when the call will come during the consultation. I'm just trying to wrap this up quickly. (FGI1, Participant C)

It is meaningless to consult in a situation where many people are waiting for a consultation during working hours. (FGI2, Participant G)

In the consultation zone, the siren keeps ringing; I feel like I'm still working rather than consulting. (FGI1, Participant A)

3) Perfunctory programs

Firefighters expressed the opinion that the intervention programs seem to be more beneficial for the psychological advisors. Moreover, the programs were formal and time consuming.

Even after one year, how was the situation dealt with back then? She asked me like that; I just felt like the whole thing was killing time somehow. That's how I felt. (FGI1, Participant A)

These are just a couple of phone calls. That's all, and they are perfunctory. That's why I think everybody has such negative opinions. (FGI2, Participant J)

4) Lack of consulting specialists

In recent years, the importance of psychological interventions for firefighters has been recognized, and efforts are being made to hire professional counselors for firefighters. However, the number of counselors remains insufficient.

Two or three people are elected annually, but there are now almost 5,000 people in the fire department. So, it's difficult for one or two consultants to cover them all. (FGI1, Participant B)

We have a professional counselor here. I wonder if it's possible to see her once a year. It's hard to cover all these people alone. (FGI2, Participant K)

5) Limited number of participants

The number of people who can participate in the pro-

grams is limited, and the participants are chosen without any psychological consideration.

There are a limited number of people who can go to 'Healing Camp', and only one or two people can go there annually. (FGI1, Participant B)

I'm not sure what the criteria are for selecting candidates. Only a few people are assigned based on the order of retirement or appointment, not those who are really needed. (FGI2, Participant L)

6) Lack of replacement workers while attending intervention programs

There is a systematic difficulty that someone has to take over when others are participating in psychological intervention programs. As a result, participants feel sorry that someone has to replace them when they attend the intervention programs

When I go to the program, the rest of the crew suffers because someone has to come in. (FGI1, Participant C)

If I use that time for consulting, the rest of the firefighters become busy. In the end, these things make us walk on eggshells, which is why I don't want to participate in the program. (FGI2, Participant J)

2. Suggestions

1) Programs focused on positive aspects of traumatic events

Participants stated that developing intervention programs based on positive rather than negative experiences is more effective in the long run.

Instead of revealing deep traumas, it is better to gradually build on positive aspects, even for small things, to overcome trauma. (FGI2, Participant H)

I think it will be more effective if we proceed with the growth program focusing on overcoming trauma rather than dwelling on its negative aspects. (FGI1, Participant E)

When I talk about my experiences with PTSD, it's not like the issue is resolved, but at some point, it becomes depressing and harder to talk about. But if someone says, 'I had a tough time, but it was worth it,' there are moments when talking like that can make everything disappear. So, I think it is preferable to concentrate on a truly positive event rather than a negative one. (FGI 2, Participant H)

2) Programs considering job characteristics

Since firefighters have different tasks and hours of work, it is necessary to develop an intervention program that considers tasks, hours of work, and work experience rather than implementing a general program.

Firefighters engage in fire, rescue, and emergency operations. They're all different. There are also outdoor and indoor jobs. Would it not be a good idea to put in place a program tailored to each field? (FGI1, Participant C)

It could be a bigger issue for novice firefighters since it's their first time. I was shocked at first. I'm calm right now. Thus, it is necessary to develop a program based on work experience. (FGI1, Participant F)

3) Programs considering individual psychosocial characteristics

The level of trauma exposure and the capacity to cope with trauma vary for each firefighter. Thus, it is necessary to develop programs that consider the personal characteristics of firefighters.

It is a requirement to offer intervention programs depending on the level of trauma experienced by each person. That may be the way an intervention works for me. (FGI1, Participant D)

I think we need to create a program that recognizes the individual capacity of each firefighter to cope with trauma. Given these individual characteristics, I believe we must develop the capacity to resist trauma. (FGI2, Participant K)

4) Developing sustainable programs

Participants said a long term, continuous program is needed instead of a one-time intervention program.

I think it should be steady support that can give hope and courage in the long term, not a one-time event. (FGI2, Participant I)

It's not a short term thing, it seems there needs to be continuous management. (FGI1, Participant F)

5) Appointing experts with knowledge of firefighting duties

To develop an effective intervention program, appointing experts who are familiar with the characteristics of the firefighting job is important. Alternatively, if possible, someone who could give practical advice based on hands-on experience and who is familiar with the job characteristics could act as an expert.

He came to me for a consultation, but he had no idea what I was doing. So, I did not want to talk about it because his credibility went down dramatically at that time. So, I think the most important thing is to have a clear understanding of our work. (FGI1, Participant A)

I think we need a professional advisor who knows the characteristics of our work while working the same shifts or in the same conditions as we do. (FGI1, Participant B)

I think the firefighters who work in the same center as we are the best people to act as counselors. (FGI2, Participant L)

6) Developing highly accessible programs using various materials

Firefighters want an intervention program that allows for immediate participation whenever the need arises. For this, it is necessary to use various materials, and anonymity is also considered an important factor to increase accessibility.

During the day, I cannot think of anything because I'm so busy, but at night, I think about it, and I feel terrible. That's why I think I need a program that allows me to consult when I need it, even after work. (FGI2, Participant H)

I think it would be great to have a site or application where you can relieve stress immediately. I think it will be somewhat more effective to have that access. (FGI1, Participant F)

If you use something like the Zoom app and have a counselor as the host from 9 am to 5 pm, I think you can get in and try it whenever you need it. (FGI1, Participant E)

7) Creating a supportive work environment for psychological programs

Participants indicate that both a supportive organizational environment and institutional support are needed for the effective implementation of psychological intervention programs. It is necessary to create an organizational atmosphere where one can share psychological difficulties naturally and participate in psychological interventions comfortably.

I think the most important thing is to create an environment in which I can get comfortable counseling without putting pressure on my work. (FGI2, Participant I)

I think we need to recognize the importance of the program internally and focus more on it. (FGI2, Participant J)

DISCUSSION

Regarding the barriers preventing participation in intervention programs, participants indicated additional workload along with firefighting work. Particularly, participants stated that they could not afford to participate in psychological intervention programs due to quarantine measures and additional work caused by COVID-19. They found it burdensome that someone had to replace them while they attended the programs. In fact, for 3 months from March 1, 2020, 34.5% of firefighters in New York City were on sick leave due to a suspected or confirmed COVID-19 outbreak, which reduced the number of emergency medical services personnel to meet the surge since COVID-19 [22]. This demonstrates that the absence of firefighters will inevitably increase the workload of other firefighters.

Additionally, the participants stated that most psychological interventions were conducted during working hours and at the workplace to increase the participation rate, but it was difficult to concentrate on counseling in a situation in which the call bell would ring anytime, and the atmosphere was formal. This is supported by previous studies showing that a comfortable and private therapy office facilitates counseling [23]. Since hyperarousal, one of the main symptoms of PTSD, is caused by environmental factors such as exposure to situations, it is essential to provide a comfortable counseling place and situation for effective counseling by firefighters [24].

Further, the number of consulting experts was too small compared to the number of firefighters, and special intervention programs were limited. In Korea, very few psychological counselors belong to the National Fire Agency, and this majorly involves employing external professional psychological counselors [25]. As a result, the program quality ends up being poor, and it inevitably becomes a formal consultation. Similar situations have been experienced in Canada, as it is difficult to consult a professional counselor; therefore, the recommended alternative was to increase the access to other creative art therapies such as music, yoga, and drama [26]. Therefore, it is needed to develop an online psychological support system that can replace the insufficient number of experts in Korea, and to provide special intervention programs useful to firefighters with limited experts. In addition, it is necessary to create a more friendly environment for psychological counseling

to minimize peer stigma by participating in a psychological counseling program [26].

The number of people who can participate in the programs is limited. For instance, In Korea, only 180 firefighters (9%) participated in the "Stress Relief Program", which was originally planned for 2,000 firefighters, and it was confirmed that only 14.9% of the KRW 1 billion budget was implemented [27]. Moreover, among firefighters who are at risk for developing PTSD (n=1,995), very few (9.7%) received mental health treatment in the past month [28]. In addition, recent psychological intervention programs observed an even lesser number of participants, due to COVID-19 concerns regarding the spread of infection. For facilitating benefits for a larger number of people, future research should develop programs with high accessibility amidst all conditions, and alternatives such as, group counseling, smartphone applications, and non-face-to-face programs.

Finally, if someone attends a special intervention program in Korea, someone else has to do their job. Therefore, participation requires assistance at the organizational level. Furthermore, participation in such psychological counseling programs should be treated as an official leave of absence, rather than as working hours so that participants can attend without experiencing any pressure.

Regarding the suggestions to develop effective intervention programs, participants said that such programs should focus on positive content. Academia and industry are now turning to new perspectives focused on practical solutions that improve the resilience of workers [2] and the positive attributes of individuals and organizations [29]. Despite experiencing traumatic incidents on the job, most firefighters overcome this shock and continue to take responsibility for people's lives and safety at disaster sites. Therefore, it is necessary to develop a program that promotes positive aspects such as post-traumatic growth of firefighters.

Psychological intervention programs for firefighters should in particular be provided by professionals familiar with the nature of firefighting work. This is because a person familiar with the characteristics of the job can give practical advice. In this regard, Henderson et al. [30] state that consideration of organizational belonging and personal factors in firefighting culture is very important for firefighters' psychological management. Kitt [23] found that firefighters were frustrated with advisors who did not understand the firefighters' culture and work. Many studies have recommended a counseling program involving experienced firefighters, possessing knowledge regarding firefighter duties [26]. Alternatively, many firefighters pre-

fer peer-led Critical Incident Stress Management, which improves adaptability and resilience and reduces stress [26]. Future studies need to extend psychological support programs toward co-workers.

Since firefighters have different types of trauma according to their job characteristics, it is necessary to develop an intervention program that considers job characteristics such as fire suppression, first aid, rescue, and internal work rather than implementing a general program. In addition, these programs should consider personal characteristics as well. Novice firefighters were exposed to approximately nine potentially traumatic events during their first 3 years in the fire department, 66% of which occurred while on duty [Gulliver, 2021]. Furthermore, programs should be tailored to account for the differences in each individual's coping strategies. A recent Korean survey evaluated the psychological variables of all firefighters [Kim, Dager, 2018]. Subsequently, high-risk groups were identified and appropriate interventions were undertaken. However, there is a need for more systematic mental health management for firefighters.

The psychological intervention provided to firefighters should be a long-term, ongoing program, not a one-time intervention program. In Korea, psychological support programs hosted by the Fire Department are provided in the form of outsourcing contracts with new companies every year. Therefore, the program lacks continuity, quality control is difficult, and there are also significant regional differences. In Australia, since 2013, MAPS (Mental Agility and Psychological Strength) has been developed for the primary prevention of PTSD in firefighters and its effectiveness has been continuously reported [7]. Similarly, Korea also offers psychological counseling programs for the past 6 years and strives to provide sustainable programs [6]. However, the entity providing the program must be maintained continuously.

Moreover, participants stated that they needed intervention services that were available any time after a traumatic event without restrictions on working hours. Joyce et al. [2] also reveal that a multifaceted approach across all levels of the organization is required for a mentally healthy work environment in a study that developed an Internet based resilience program for firefighters. Online psychological intervention programs are essential to improve accessibility.

Finally, participants emphasized that a supportive organizational atmosphere and institutional support were important for the effective implementation of psychological intervention programs. Firefighters do not often exhibit psychological difficulties in trying to maintain their

image of "trust". Moreover, psychological issues within firefighter organizations are not well understood as they tend to hide a negative organizational culture. Consequently, good facilitation strategies are needed to overcome the silence and stigma associated with mental health in the firefighter culture [23].

In summary, firefighters want "flexible, effective, positive aspects based, and tailored" psychological intervention programs. In other words, although various psychological interventions are provided, these programs must be flexible enough to fit the specific individual and professional characteristics of firefighters. Additionally, the programs must be of practical use to firefighters and should not be perfunctory programs. Finally, there is a need to concentrate on the positive content without continuing to reflect on the negative aspects of traumatic events.

In this study, focus group interview and qualitative content analysis were applied to examine Korean firefighters' perceptions of psychological intervention programs during the COVID-19 pandemic. The strength of this study is that it presents detailed and clear barriers and suggestions based on interviews of firefighters working in the field. Based on this, it is expected that practical mental nursing interventions for firefighters can be developed. In addition, as a domestic firefighting hospital is scheduled to be established in 2024, it is expected that the main research results will be used as basic data for firefighters' trauma management and holistic nursing. However, it is difficult to generalize the findings from this study because only limited subjects were involved in a city. In a future study, it will be necessary to investigate the perception of psychological intervention for firefighters who have other work than emergency medical services and administrative work.

CONCLUSION

As a result of conducting FGI to investigate the perceptions of Korean firefighters' psychological intervention programs in the context of the COVID-19 pandemic, six barriers and seven proposals to keep in mind when developing psychological intervention programs were identified. The intervention programs should focus on the positive aspects of traumatic events, with flexibility and practical effectiveness, tailored to the individual and professional characteristics of firefighters.

Based on these results, we propose the following: first, psychological experts should be recruited in firefighting organizations, or, if they are external experts, training

should be provided on the characteristics of firefighting work. Second, it is necessary to develop a positive psychological intervention program free from temporal and spatial constraints. Third, a supportive organizational atmosphere and institutional support must be established.

CONFLICTS OF INTEREST

The authors declared no conflicts of interest.

AUTHOR CONTRIBUTIONS

Conceptualization or/and Methodology: Kwak M & Im M

Data curation or/and Analysis: Kwak M & Im M

Funding acquisition: Kwak M

Investigation: Kwak M & Im M

Project administration or/and Supervision: Kwak M

Resources or/and Software: Kwak M & Im M

Validation: Kwak M & Im M

Visualization: Kwak M & Im M

Writing: original draft or/and review & editing: Kwak M & Im M

ORCID

Kwak, Minyeong <https://orcid.org/0000-0002-8800-0886>

Im, Mihae <https://orcid.org/0000-0002-3795-5201>

REFERENCES

- Makwana N. Disaster and its impact on mental health: a narrative review. *Journal of Family Medicine and Primary Care*. 2019;8(10):3090-3095. https://doi.org/10.4103/jfmpc.jfmpc_893_19
- Joyce S, Shand F, Bryant RA, Lal TJ, Harvey SB. Mindfulness-based resilience training in the workplace: pilot study of the Internet-based Resilience@Work (RAW) mindfulness program. *Journal of Medical Internet Research*. 2018;20(9):e10326. <https://doi.org/10.2196/10326>
- Rajabi F, Molaeifar H, Jahangiri M, Taheri S, Banaee S, Farhadi P. Occupational stressors among firefighters: application of multi-criteria decision making (MCDM) Techniques. *Heliyon*. 2020;6(4):e03820. <https://doi.org/10.1016/j.heliyon.2020.e03820>
- Choi N. 5 years of depression, 79% of firefighters treated with PTSD ↑ ... Mental health. "Red light". Less than 10% of firefighters' 'stress recovery program' support... "Activation effort required". *Fire Prevention News* [Internet]. 2021 Sep 19 [cited 2022 Apr 08]. Available from: <https://www.fpn119.co.kr/164737>
- Obuobi-Donkor G, Oluwasina F, Nkire N, Agyapong VIO. A scoping review on the prevalence and determinants of post-traumatic stress disorder among military personnel and firefighters: implications for public policy and practice. *International Journal of Environmental Research and Public Health*. 2022;19(3):1565. <https://doi.org/10.3390/ijerph19031565>
- Im M, Kwak M. An integrative literature review on psychological intervention research for firefighters. *Journal of Korean Academic Psychiatric Mental Health Nursing*. 2021;30(2):153-167. <https://doi.org/10.12934/jkpmhn.2021.30.2.153>
- Skeffington PM, Rees CS, Mazzucchelli TG, Kane RT. The primary prevention of PTSD in firefighters: preliminary results of an RCT with 12-month follow-up. *PLoS ONE*. 2016;11(7):e0155873. <https://doi.org/10.1371/journal.pone.0155873>
- Shin JH, Sim MY, Lee JH, Lee DY, Jeon KS, Oh SA, et al. Stress relief and related factors in camp program for firefighters. *Stress*. 2018;26(2):88-94. <https://doi.org/10.17547/kjsr.2018.26.2.88>
- Kim JJ, Choi TY, Kim SY, Park JH. The effect of mental health improvement programs for firefighters. *Anxiety and Mood*. 2017;13(1):17-24. <https://doi.org/10.24986/anxmod.2017.13.1.003>
- Lee JH, Lee D, Kim J, Jeon K, Sim M. Duty-related trauma exposure and posttraumatic stress symptoms in professional firefighters. *Journal of Traumatic Stress*. 2017;30(2):141. <https://doi.org/10.1002/jts.22180>
- Ryu JA, Ha EH, Jeong-Choi KH, Kim JE, Park SW, Kim HJ. Firefighters and posttraumatic stress disorder. *Korean Journal of Biology Psychiatry*. 2017;24(1):10-18.
- Park T, Kwan J, Kim S, Chang M, Kim C, Lee J. Suitability assessment of the functional content platform for stress reduction in firefighters. *The Korean Institute of Fire Science & Engineering*. 2021;35(3):99-104. <https://doi.org/10.7731/KIFSE.f923b427>
- Sarsar ED, Zeiders KH, Pace TWW, Cook SH, Hoyt LT. Pilot testing app-based meditation intervention among firefighters during the COVID-19 pandemic. *Psychoneuroendocrinology*. 2021;13:105515. <https://doi.org/10.1016/j.psyneuen.2021.105515>
- Yoo E. "COVID-19, even made firefighters feel sick". *Fire Prevention News* [Internet]. 2021 Dec 06 [cited 2022 Apr 08]. Available from: <https://www.fpn119.co.kr/168801>
- Tausch AP, Menold N. Methodological aspects of focus groups in health research: results of qualitative interviews with focus groups moderators. *Global Qualitative Nursing Research*. 2016;3:2333393616630466. <https://doi.org/10.1177/2333393616630466>
- Jane T. Focus groups: a method of needs assessment. *Journal of Continuing Education in the Health Professions*. 2005;18(3):150-154. <https://doi.org/10.1002/chp.1340180304>
- Elo S, Kyngas H. The qualitative content analysis process. *Journal of Advanced Nursing*. 2008;62(1):107-115. <https://doi.org/10.1111/j.1365-2648.2007.04569.x>

18. Kim SR, Kim R. Analysis of trend of post-traumatic stress disorder (PTSD) in Gyeonggi Area. *Asia-pacific Journal of Multimedia Services Convergent with Art, Humanities, and Sociology*. 2018;8(7):523-531.
<https://doi.org/10.35873/ajmahs.2018.8.7.052>
19. Gulliver SB, Zimering RT, Knight J, Morissette SB, Kamholz BW, Pennington ML, et al. A prospective study of firefighters' PTSD and depression symptoms: the first 3 years of service. *Psychological Trauma: Theory, Research, Practice and Policy*. 2021;13(1):44-55. <https://doi.org/10.1037/tra0000980>
20. Guest G, Namey E, McKenna. How many focus groups are enough? Building an evidence base for nonprobability sample sizes. *Field Methods*. 2017;29(1):3-22.
<https://doi.org/10.1177/1525822X16639015>
21. Lincoln YS, Guba EG. *Naturalistic Inquiry*. Beverly Hills, CA: Sage Publications; 1985. p. 1-416.
22. Prezant DJ, Zeig-Owens R, Schwartz T, Liu Y, Hurwitz K, Beecher S, et al. Medical leave associated with COVID-19 among emergency medical system responders and firefighters in New York City. *JAMA Network Open*. 2020;3(7):e2016094.
<https://doi.org/10.1001/jamanetworkopen.2020.16094>
23. Kitt LR. *Breaking the silence: insights into the impact of being a firefighter on men's mental health* [master's dissertation]. [Vancouver]: University of British Columbia; 2009 July. 287p.
24. Stoddard FJ, Sheridan RL, Martyn JA, Czarnik JE, Deal VT. Pain management. In: Ritchie EC, editor. *Combat and operational behavioral health*. Washington, DC: Office of the Surgeon General, Department of the Army; 2011. p. 339-358.
25. Won GH, Lee JH, Choi TY, Yoon S, Kim SY, Park JH. The effect of a mental health promotion program on Korea firefighters. *International Journal of Social Psychiatry*. 2020;66(7):675-681.
<https://doi.org/10.1177/0020764020920918>
26. Isaac GM, Buchanan MJ. Extinguishing stigma among firefighters: An examination of stress, social support, and help-seeking attitudes. *Psychology*. 2021;12(3):349-373.
<https://doi.org/10.4236/psych.2021.123023>
27. Kim T. Less than 10% of firefighters' 'stress recovery program' support... "Activation effort required". *Today News* [Internet]. 2021 Oct 07 [cited 2021 Oct 19]. Available from: <https://www.ntoday.co.kr/news/articleView.html?idxno=80831>
28. 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(1):e0190630.
<https://doi.org/10.1371/journal.pone.0190630>
29. Wright TA. A look at two methodological challenges for scholars interested in positive organizational behavior. In: Nelson DL, Cooper CL, editor. *Positive Organizational Behavior*. Thousand Oaks, CA: Sage Publications; 2017. p. 177-190.
30. Henderson E, Guthrie BJ. Conceptualizing suicidal ideation among firefighters through the lens of an integrated theoretical model. *Nursing Science Quarterly*. 2021;34(3):294-300.
<https://doi.org/10.1177/089431842111010453>