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Current Female Firefighters' Perceptions, Attitudes, and Experiences with Injury

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Abstract

Research presented here examines how the demands of fire fighting uniquely affect women. A national sample of 73 female firefighters and fire-service leaders participated in focus groups and key informant interviews. Participants were asked about perceived threats to safety and standard operating procedures (SOPs) that lead to injury regarding gender differences. A thematic qualitative analysis was conducted and the following six themes were identified: (1) impact of working in a male-dominated field, (2) harassment, (3) similar rates/types of injury, (4) inadequate training, (5) ill-fitting gear, and (6) functional techniques/endurance. Both chronic and acute injuries/causes were discussed. Future direction will require diversity education and new training methodologies for the fire service.

Keywords

female firefighter; injury; training; occupational health; harassment

Introduction

Fire fighting is an inherently dangerous occupation with high rates of injuries and fatalities. Although women are substantially underrepresented in the fire service, their numbers are growing, and research must be directed toward female-specific injuries, fatalities, and training. Nearly a quarter of a century after women first entered fire fighting as a career, the National Fire Protection Association (NFPA) reports that more than 10,000 women hold career-level fire-suppression positions in nearly 1,000 fire departments in the United States (US). The national annual average percentage of female career firefighters from 2008–2012

was 3.8% (National Fire Protection Association [NFPA], 2015). Of the 1,134,400 career and volunteer firefighters in the US in 2014, 82,550 (7%) were women (Haynes & Stein, 2016).

Fire fighting has one of the highest rates for occupational injuries and fatalities (Poplin, Harris, Pollack, Peate, & Burgess, 2012). Each year, the NFPA conducts a Survey of Fire Departments for US Fire Experience to study firefighter injuries and fatalities in order to provide national statistics on their frequency, severity, and characteristics. Figure 1 illustrates the distribution of firefighter injuries in 2015.

The NFPA estimated that 68,085 firefighter injuries occurred in the line of duty in 2015 (Haynes & Molis, 2016). Almost half (42.8% or $n = 29,130$) of these injuries occurred during fireground operations, which included structure fires, vehicle fires, brush fires, etc., and referred to all activities from the moment of arrival at the scene to departure time, including setup, extinguishment, and overhaul (Haynes & Molis, 2016).

Approximately 13,275 injuries occurred at nonfire emergency incidents, 3,800 while responding/returning from an incident, 7,560 during training activities, and 14,320 occurred during other on-duty activities (Haynes & Molis, 2016). Strains, sprains, or muscular pain accounted for 52.7% of fireground injuries (Haynes & Molis, 2016). In fact, among emergency medical services (EMS), fire fighting, and police occupations, sprains and strains were the leading causes of injuries treated in US hospital emergency departments between 2000 and 2001 (Reichard & Jackson, 2010). While general rates are informative, data are not reported by gender due to the small numbers of female firefighters, so little is known about how the tasks and roles of fire fighting impact women in the fire service.

Most emergency-response activities require awkward positioning and significant exertion, increasing the likelihood of injury (Poplin et al., 2012). In order to perform fire-suppression and rescue duties safely and effectively, it is necessary that firefighters possess strength, stamina, and agility (Hulett, Bendick, Thomas, & Moccio, 2008). Women must be equally trained and equipped in a way to avoid injury and enable them to safely perform the job of a firefighter. However, according to iWomen, the largest organization of female firefighters in the US, more than half (58%) of women reported ill-fitting protective gear. In addition, 14% of women reported ill-fitting self-contained breathing apparatus (SCBA) face pieces, a vital piece of protective gear (Hulett et al., 2008). With females representing a small percentage of the fire service, the lack of properly fitting equipment and specific training for women may be overlooked by leadership and training officers (Hulett et al., 2008; US Department of Labor, 2009). However, since there are over 82,000 female members of the US fire service (which has explicit goals for increasing diversity), it is imperative that women are as well prepared, equipped, and trained as their male counterparts.

A qualitative study was completed in 2008 that examined recruitment and retention issues in the fire service. Several reasons for why the number of females in the fire service are still so low were noted including the following: (1) discrimination and harassment, (2) recruitment, and (3) physical testing and equipment issues, echoing issues noted by iWomen nearly 20 years prior (Federal Emergency Management Agency [FEMA], 1996; Hulett et al., 2008). Injury was not specifically explored in the 2008 report, but it has been suggested that the

exclusion of women in the emerging scientific literature on firefighters may also contribute to low rates of women in the fire service (Jahnke et al., 2012).

The present study is novel because there are little systematic data on injuries among women firefighters. Although the fire service has a mission of increasing diversity, current studies demonstrate that women face similar challenges noted more than 20 years ago (FEMA, 1996; Hulett et al., 2008; Jahnke et al., 2012).

This study utilizes the Person-Environment Fit (PEFit) Model for the study of occupational stress and relates this model specifically to women in the fire service. The PE-Fit Model posits that when occupational demands and pressures exceed the capability of an employee to deal with them or when these demands do not align with one's morals, this "lack of fit" contributes to overburden, role ambiguity, and conflicting role demands (Quick & Tetrick, 2003, p. 187). The resulting physical and psychological stress can then lead to adverse behavioral consequences such as lower productivity, absenteeism, turnover, employee burnout, and health-related problems (Quick & Tetrick, 2003).

The research presented here uses qualitative methods to explore perceptions, beliefs, and attitudes regarding injury among current female firefighters and key leaders from the fire-service community. The aim of this research is to build upon the current literature and bridge the gap in knowledge, training, and education regarding female firefighters and their experiences in the fire service by examining key themes regarding current female injury rates, experiences with injury, perceptions, and training.

Methods

This section discusses the methods used in this study. The section is organized into three subsections: (1) study design and measures, (2) participants, and (3) data-analysis procedures.

Study Design and Measures

This qualitative study used grounded theory to develop themes based on feedback from participants. Seventy-three subjects participated in one of eight focus groups. Focus groups occurred at national conferences and in areas/departments where the research team had access to large groups of women firefighters. Interviews took place with women in leadership positions across the US based on recommendations from fire-service advisors.

After explaining the purpose and procedures of the study, participants were provided an opportunity to ask questions. Participants then signed informed consent documentation and completed a brief demographic questionnaire. The discussion began with the question, "What are the biggest health concerns facing the fire service?" The Results section provides an analysis of the responses to that question that were related to injury, as well as responses to specific questions regarding injury such as "What are the biggest threats to safety [in the fire service]?"

All focus groups were transcribed verbatim. After the initial question, domains covered in the sessions included task-related stress and safety, standard operating procedures (SOPs)

relating to safety and gender differences, on-the-job injuries, and training differences between men and women. Responses from the resulting discussion are presented in the Results section.

Participants

A national sample of 73 current female firefighters and fire-service leaders, aged 25–66 years, participated in this study. Number of years in the fire service (experience) ranged from 3 to 30 years. Focus groups were convened by inviting past participants from previous research projects as well as by recruiting participants at national fire-service conferences (e.g., iWomen). There were 27 female fire-service leaders and 46 female firefighters who participated in this study.

Data-Analysis Procedures

A two-phase process was used to capture the meaning behind the transcribed text with the overall purpose of understanding major themes across and between transcripts. First, researchers reviewed the transcribed documents to develop a familiarity with the text and began a thematic analysis by searching for patterns and themes that occurred frequently in a single interview or were common across interviews. The data were then coded by identifying major patterns and themes. Use of multiple reviewers assisted in establishing the thematic framework.

Next, the transcripts were uploaded to NVivo 10, a qualitative data-analysis software that allows researchers to highlight and code data into “parent” nodes for overall themes and “child” nodes for subthemes. Summaries were then made within each major/parent theme. The two primary coders compared their analyses, and any discrepancies were discussed. A third researcher reviewed the findings of the two primary analyses to confirm that the summary of the findings was reflective of the data collected.

Results

The following major themes were identified, but are not listed in order of importance or occurrence:

1. Similar rates/types of injury regardless of gender
2. Impact of working in a male-dominated field
3. Focus on functional movement techniques/muscular endurance
4. Inadequate fire service training
5. Ill-fitting gear
6. Harassment affecting performance on the job.

Since responses were similar across the leader and firefighter groups, the results were combined.

In general, participants thought that males’ and females’ experiences with injury types and rates were similar across genders. Perceived common injuries for females included mostly

upper-body injuries: back, neck, and shoulder, but they also noted knee and ankle injuries. Participants stated the following:

- “Fire doesn’t discriminate. It will kill you either way, whether you’re male or female.”
- “... So, I think the danger’s equal whether you’re male or female ...”
- “I think the injuries are pretty much [the same] across the board.”

Others noted that females being in a male-dominated field contributed to an increased risk for injury. Being the minority group pushed women to try harder, get stronger, and often times not ask for the help they needed, even on tasks that, to be completed safely, required more than one person.

I think we put ourselves at risk sometimes for trying to do more than we’re capable of because of that risk of scrutiny that, you know hey, I’ll go that extra mile, I’ll pick up that extra piece of equipment. I’ll do something instead of asking for help.

Another participant stated the following:

... sometimes not wanting to ask for help, like, wanting to prove themselves so they’re going to try to lift something instead of asking for help ... and it’s probably too heavy for them to be lifting ... but they want to prove that they can do it. And ... they’re not using proper technique ... to do things.

A different participant added the following:

I think that we push ourselves so hard that we are operating outside of probably what’s safe for us ... whether it’s having to reach further to vent or um, physically, where, you know — something hurts and you know in your brain, “Oh crap. That’s a hurt.” That’s just not a “I’m working too hard,” and working anyways.

Participants often noted a constant need to “prove” themselves. This idea led to injury by taking on too great a work load or by avoiding asking for help because male workers would have concluded females were not cut out for the job even though male counterparts asked for help in similar situations.

Some of the most difficult tasks for women included activities requiring upper-body strength. Participants noted that back injuries were common for both sexes, usually due to inadequate strength and poor lifting techniques; but participants also noted shoulder, neck, knee, and ankle injuries were common among women due to a smaller body size and ill-fitting gear. A gap was identified in traditional training methods. Often, only one method of a skill was taught when in reality there were multiple different ways to complete a task, depending on the situation and the strengths and weaknesses of the crew completing that task.

... there was a training exercise where you’re supposed to get someone out of a window, down a ladder, and carry them down. And there was one way where your arms are across and they’re lying on your arms and you’re walking down the ladder, but he was, like, a wider person. He wasn’t heavy, but it’s just that my one arm couldn’t reach ... We just had to, tweak his bottle [air pack] a little this way —

and, like, tilt him, and then I could reach on both sides. I'm not going to go down with my friend because we're playing training and I drop him.

Women have different musculature and often used different body mechanics when lifting, moving equipment, and doing work on the fireground. Females and males who have less upper-body strength experienced difficulty executing tasks in a traditional manner. It was suggested that alternative methods for accomplishing tasks be offered.

You know, it's certainly peer reviewed that they could pull from. And I guess bottom line it's OK to admit that women are not stronger, and we accept that. We know we're not stronger, but we're going to figure out how to do it. We're going to adapt.

So we're going to be smarter and use our body. Because if you're spent because you have to do a certain drill a certain way on the fireground and you're spent, then what good are you for your team for the rest of the work that needs to be done?

As mentioned previously, many participants identified inadequate training as a threat to safety and increased risk for injury. Education was identified as a limiting factor regarding training. "I think that there is a huge gap [in] fitness training. Even for the men, it's very traditional, like the CPAT [Candidate Physical Ability Test] and Cooper's test and pushups, sit ups, and military press. And women's bodies are different." Participants identified the need for training on different methods of accomplishing the same task to allow those with different body types to use a method that complimented their strengths as opposed to enhancing their weaknesses. Participants suggested that females use more leg strength to complete a task whereas males may use more upper-body strength.

I would say [we use] our waist and legs ... our upper body is not, not as (inaudible) as theirs. I mean, we can work out all we want, but we're not going to be as strong as them up top. So, we just have to do things differently, so obviously technique.

We can be just as strong; we just have to do it differently. I mean, we look funny, but we're going to do it.

Also, as firefighters aged, they needed different training and techniques to accommodate their changing bodies. "... and women's bodies are different, especially between 30 and 45. First of all, there are the hormonal changes"

Another participant added:

When I was 35 ... what I could do at 35 and what I could do at 45 was — there was a decline from there. But then ... (from 45 or 35) to what I am now, which is 48, there's an even more drastic decline. The decline is even more significant. And it could be because of injury, but I don't know.

One participant also noted that "policy and practice are two different things" when talking about what training and policies were in place to ensure safety and what was actually done on the fireground. This comment was an important note for higher ranking officers and the organization as a whole regarding aligning training with SOPs to ensure safety for all members of the organization.

Participants identified issues with ill-fitting gear as one of the biggest threats to safety and increased risk for injury among female firefighters. Ill-fitting boots, in particular, were identified as leading to ankle injuries. Women reported that the bunker gear in their respective departments was made for males. "... you know, gear and clothing, recognizing that women and small men have not been fit properly for decades." "... women are getting (inaudible) leftover gear and when they buy things, they buy them in bulk..." One participant noted her department had to go through a lawsuit before they offered female-specific protective equipment or bunker gear. "Our gear is good now. We had to go through unfortunately a lawsuit to, uh, make it right. But now, it's no problem with the gear. They have female's; they have men's. It fits pretty good."

SCBA masks often were reported as being "unisex" but were made to fit a wider jaw, so many females with more narrow faces could hardly get a good seal. It was stated that, if their mask did not seal tightly around their face, they had an increased exposure to inhalation hazards during a fire, where the SCBA should be their first line of defense. "... it's not correctly sized. And it does pass the fit test initially, but ... there's no smaller size available. Our faces are narrower, so that if they get stretched out in the least, they're not going to make a seal."

Harassment was an interesting factor identified that led to injuries. Women noted that they did not have the support of their male crew members and were even threatened by them. Some of the participants interviewed reported being threatened by or made uncomfortable by male coworkers on the job. One participant said she was told, "You're just here looking for a husband." This harassment was not only inappropriate, but females noted that comments like this made them less confident and impacted their performances on the job. Participants stated that adversity to females came from both older and younger members of the fire service. "... sometimes I think [it was] not the older guys but some of the younger guys [who] got intimidated that a girl came in and could do the job." One participant noted "male counterparts that don't want them [females] there" as the biggest threat to safety for female firefighters.

... they'll berate you and belittle you so much that you start doubting yourself. And when you doubt yourself, and you worry, that's when you're more apt ... to have an accident or get hurt. I've had firefighters tell me to my face that if they were going to hurt me or kill me ... they could get me alone in a house fire. It's my word against theirs, so ... you know, what are they going to do? Nothing.

One participant said, "... training officers or leadership in the department have said, 'Let's make this hard enough so the women won't pass.'"

Discussion

The purpose of this study was to explore current themes reported by female firefighters related to their perceptions, attitudes, and experiences with injury to build upon what is currently known. This study exposes similar issues that have been experienced by females in the fire service for years. Many of the issues identified in this study echo and expand on problems identified as early as 1995 when iWomen conducted their initial survey of women

in the fire service (FEMA, 1996). More than 20 years later, women still represent a similar percentage of the fire service and are experiencing similar issues, exposing possible problems with recruitment and retention of females in the fire service and identifying some issues with training and education. Our results reinforce the need for further research, as well as policy and guideline/SOP changes in the fire service to increase the possible recruitment pool of new firefighters, improve retention, and provide a healthier occupational environment. Diversity education for the entire fire service is also necessary to enhance a culture of change.

A National Report Card on Women in Firefighting examined the inclusion, acceptance, training, testing, and promotion of women in fire and emergency services (Hulett et al., 2008). The study identified the following key factors that may act as barriers to women entering or remaining in the fire service:

1. Discrimination and harassment;
2. Unfair recruiting methods;
3. Inadequate uniforms/equipment;
4. Inadequate firehouse living accommodations;
5. Sexual harassment; and
6. Unfair promotional processes.

All of these factors may be a part of an underlying workplace culture that does not fully accept female firefighters. Nine years later, our research found similar themes regarding women in the fire service, and specifically it found how factors that have been identified for years still impact female injury rates on the fireground and gives insight into how we can improve these factors.

Sinden et al. (2013) conducted qualitative research about the occupational experiences of female firefighters and identified similar themes including the following:

1. Physical demands/difficulties;
2. Gender-related physiological differences;
3. Compensatory strategies;
4. Equipment maladaptation;
5. Earning respect;
6. Negative attitudes of male counterparts; and
7. Recognition of injury risk.

Studies have shown that female firefighters experience higher rates of injury than male firefighters, but these studies neglect to capture the reasons behind these findings (Liao, Arvey, Butler, & Nutting, 2001; Sinden et al., 2013). Neglecting to research this subset of the population can lead to negative outcomes as discussed in our findings. An unhealthy occupational environment — one in which the employee feels under-valued, constantly

challenged, and/or undermined — leads to negative health outcomes, both physically and psychologically (Quick & Tetrick, 2003).

Women are an integral part of the workforce. Better understanding how they differ from their male counterparts in size, stature, and training requirements will allow for advances in training and equipment, increased female recruitment and retention, decreased time away from the job due to injury, and decreased injury costs for fire departments. The discrimination and harassment women in the fire service face may affect job performance physically as well as mentally. Work-related stress has been shown to lead to decreased health (Quick & Tetrick, 2003).

As discussed previously, the PE-Fit model suggests that when occupational demands and pressures exceed one's ability to cope with them, the employee becomes overburdened, and the employee must deal with role ambiguity and conflicting role demands (Quick & Tetrick, 2003). The resulting physical and psychological stress can lead to adverse behavioral consequences such as lower productivity, absenteeism, turnover, employee burnout, and health-related issues (Quick & Tetrick, 2003). The harassment and adversity female firefighters face may be a reason there are still so few women in the fire service today. Correcting these issues can increase recruitment and retention within the fire service.

The current body of literature shows the need for change in the fire service with respect to female firefighters. By accessing women in the fire service at various national conferences, we were able to obtain numerous responses; and as our results are similar to what current literature are available, it is likely representative of the female firefighter population as a whole. In general, the findings offer an interesting glimpse of the perceptions of the health of women in the fire service with some unique challenges. Findings also highlight some of the similarities and differences between male and female firefighters and bolster the argument for studying female firefighters as a unique occupational subpopulation.

Study Limitations

Similar to other qualitative studies, this study has some important limitations; although the findings do mirror results of other research. For example, the study supports previous findings that identified occupational risk factors for female firefighters and the interrelationship between gender and psychosocial work factors. The interview questions were developed to elicit personal insights into the experiences of females working in a physically demanding, male-dominated field. Questions surrounding experiences with gender issues may have influenced their responses; however, the questions were developed to understand the general experiences of female firefighters.

The identified themes represent synthesis and analysis of all interview questions. Also, although the focus groups and key-informant interviews were drawn from a national sample of female firefighters, with females representing such a small percentage of the fire service, it is possible that some “voices” of female firefighters may have been missed in this investigation. As such, future research should focus on further examining the experiences of females in the fire service.

Conclusion

Qualitative studies such as this one can be used to develop questions that guide future research. Further research should be directed at investigating female firefighters and their performances and risks for injuries on the fireground. It is important to examine how barriers faced at work affect the work climate as well as her ability to do her job effectively. Research must also examine the negative health outcomes of a hostile work environment. Studies should examine the impact that these issues have on the recruitment and retention of women firefighters. This factor is a major public-health issue as females are part of the responders that protect communities all across the US. In order to better protect our communities, we must make an effort to better recruit, protect, train, and educate these first responders and those that work with them. Educating fire-service trainers on diverse methods of training and accomplishing fireground tasks will ensure a more well-rounded fire service. In addition, education for the fire service as a whole regarding diversity, inclusion, and harassment in the work place is imperative.

Future research to mitigate injury should examine task components of fire fighting and consider the interaction between gender and performance demands in fire-fighting tasks. Training is a significant opportunity in the fire service. In a job in which one depends on his/her crew members for their lives, it is dangerous when there are crews who may not watch out for the entire team's safety solely because of gender differences. There is a need not only for changes in physical training but also in education and training regarding diversity in the workplace as well. Training programs for firefighters, both male and female, must be evaluated for effectiveness and to ensure that they reflect the most current training recommendations. Additional data must be gathered regarding women firefighters to assess female-specific injuries, injury rates, and ways to prevent injuries in this subset. Research also should be directed towards the fit of equipment and protective gear for females.

Addressing the issues identified in this study will require policy changes for injury prevention. The data suggest that the fire service must include female-specific training for drills and fitness training, including strength training, with a consideration for female anatomy and musculature. The National Fire Incident Reporting System (NFIRS) needs to be organized in such a way that data can be collected with regard to women firefighters. Also, the NFPA might consider collecting gender-specific data. SOPs must be reviewed by fire-service leadership for relevance to today's female fire-service personnel. Given the high rates of injury among firefighters and the physically demanding nature of the job, it is important to fully understand the risks. Very little data exist in the published literature that focus on injuries among female firefighters.

In order for changes in knowledge and training to be effective, a significant push to include representation from organizations such as the International Association of Firefighters (IAFF), the fire-service training leadership as represented by the International Fire Service Training Association (IFSTA) as well as overall fire-service leadership represented by the International Association of Fire Chiefs (IAFC) is critical. It is suggested that these associations are contacted with respect to this current information and to request input as to methods and information needs moving forward. By inclusion, the ability to reach many

more female firefighters can become a reality; and, by extension, conclusions and recommended changes can be disseminated to those who can affect these changes.

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Biography

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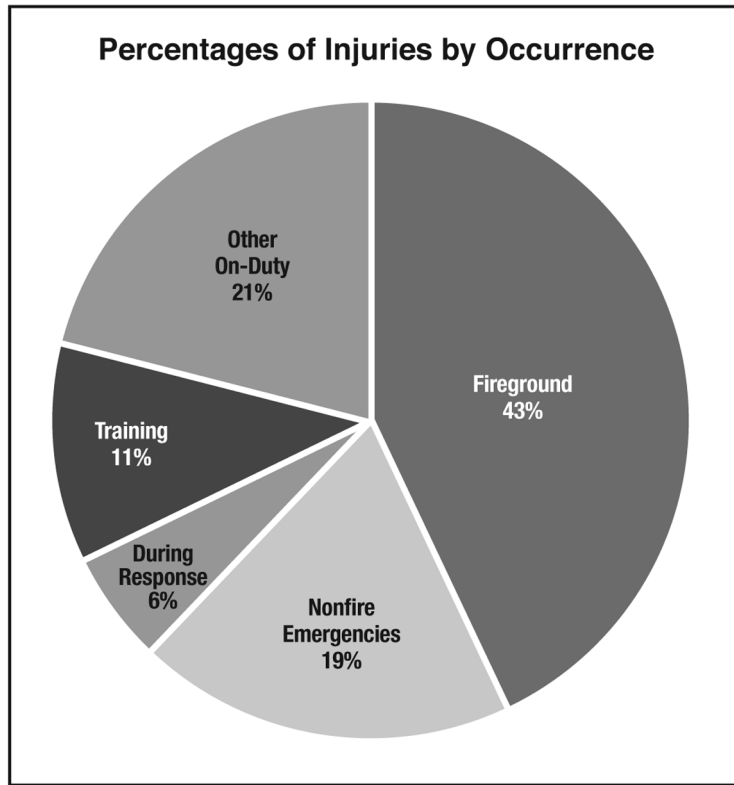


Figure 1:
Injury Occurrence (%) (Haynes & Molis, 2016).