



# Assessment of relationships between work stress, work-family conflict, burnout and firefighter safety behavior outcomes



Todd D. Smith<sup>a,\*</sup>, Kevin Hughes<sup>a</sup>, David M. DeJoy<sup>b</sup>, Mari-Amanda Dyal<sup>c</sup>

<sup>a</sup> Indiana University School of Public Health – Bloomington, Department of Applied Health Science, Bloomington, IN, USA

<sup>b</sup> Workplace Health Group, Department of Health Promotion and Behavior, University of Georgia, College of Public Health, Athens, GA, USA

<sup>c</sup> Kennesaw State University, Department of Health Promotion and Physical Education, Kennesaw, GA, USA

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## ABSTRACT

**Introduction:** Burnout, in the context of emotional exhaustion, cynicism and depersonalization, has resulted in detrimental effects to workers. The relationship with safety outcomes, however, has not been fully explored, particularly in the American fire service. The main focus of this study is to delineate the relationships between work stress, work-family conflict, burnout and firefighter safety behavior outcomes.

**Methods:** Data were collected from career firefighters in the southeastern United States ( $n = 208$ ). Path analysis, which allows for the simultaneous modeling of regression relationships, was completed to assess the relationships between work stress, work-family conflict and burnout and the relationships between burnout and multiple firefighter safety behavior outcomes including compliance with personal protective equipment procedures, safe work practices and safety reporting and communication behavior.

**Results:** Analyses indicated that both work stress and work-family conflict predicted burnout and burnout negatively influenced personal protective equipment compliance, adherence to safety work practices, and safety reporting and communication.

**Conclusions:** Firefighter burnout significantly impacts firefighter safety performance. Firefighters are less likely to exhibit compliance oriented and self-protective behaviors, which may have implications on overall firefighter safety, health and wellbeing.

## 1. Introduction

Approximately one million firefighters in the United States risk their lives daily for the benefit of society. These firefighters extinguish fires, function as emergency responders, respond to disaster situations and perform numerous other duties requested of them by their organizations, municipalities, business organizations and the public. These work roles and responsibilities are some of the most hazardous encountered by any workforce and are both psychologically and physically demanding (DeJoy et al., 2017). In this context and environment, proper safety practices and behaviors are critical to minimize risks of injury, illness or death, especially since we have not witnessed sustained reductions in fatalities and injuries over the past few decades. Despite limited progress over a few years, recent trends again illustrate that approximately 100 firefighters die from line-of-duty operations each year and around 70,000 or more are injured each year (Haynes and Molis, 2016; USFA, 2002, 2016).

To control hazards and minimize inevitable risks associated with

line-of-duty operations to acceptable levels, firefighters must properly utilize and maintain needed personal protective equipment (PPE), follow established standard operating procedures and safe work practices and communicate and report identified safety concerns. This communication is essential so that hazardous situations can be abated or avoided and so that supervisors or fellow firefighters can take the necessary precautions to avoid uncontrollable hazardous exposures, environments and situations. Although there is evidence that these types of firefighter safety behaviors can be maintained and enhanced by a positive safety climate (Prati and Pietrantonio, 2012; Smith and DeJoy, 2014) and through transformational leaders that focus on safety (Smith et al., 2016), it is believed that stress-related factors or affective reactions to ongoing stress such as burnout (Shirom, 2011), may diminish these safety outcomes.

Burnout is multi-faceted, but is generally comprised of three components including exhaustion, depersonalization and cynicism (ten Brummelhuis et al., 2011). Exhaustion is exemplified as a decrease in energy to perform work; depersonalization is a state in which an

\* Corresponding author at: Indiana University School of Public Health – Bloomington, Department of Applied Health Science, 1025 E., 7th Street, Rm. 116, Bloomington, IN 47405, USA.

E-mail address: [smithtod@indiana.edu](mailto:smithtod@indiana.edu) (T.D. Smith).

emotional distance is created where workers disengage or withdraw from their work, workplace, and co-workers (Basinska and Wiciak, 2012); and, cynicism is expressed through the development of impersonal and unsympathetic attitudes toward the recipients of one's service or work (Lewig et al., 2007). In contrast to engagement, burnout diminishes the desire to participate in work activities, meet goals, support co-workers and is negatively associated with job performance (Shirom, 2011). This negative relationship may be explained by a reduced capacity to cope and lower levels of motivation to perform (Halbesleben and Bowler, 2007; Shirom, 2011). Further, burnout, when conceptualized as emotional exhaustion, has been associated with diminished job satisfaction, organizational commitment, and ultimately organizational deviance (Mulki et al., 2006), which is characterized by a lack of compliance with established norms and expectations. Work-related stress, and particularly burnout, have been associated with a variety of diminished outcomes including health behaviors, medical errors, musculoskeletal disease and injury in a variety of work groups (Halbesleben et al., 2008; Honkonen et al. 2006; Moustou et al., 2010; Nahrang et al., 2011; Shanafelt et al., 2010). Given this evidence that burnout may diminish safety outcomes, along with health outcomes, and based on the fact that burnout has been associated with diminished performance and compliance in the context of organizational deviance, we hypothesize that firefighters, who are exhausted, cynical and detached, in the form of burnout, will be less likely to follow required safe work practices (Hypothesis 1), to prepare, maintain and use PPE as required (Hypothesis 2), and will be less likely to communicate and report safety concerns (Hypothesis 3).

The overall purpose of the present research is to build and test a model that examines these associations. Further, we intend to assess the direct effects of work stress and work-family conflict on burnout in our sample of firefighters. Several models of the stress-burnout relationship have argued that burnout is a consequence or affective response of one's exposure to chronic job stress (Halbesleben and Buckley, 2004; Shirom, 2011). Thus, we hypothesize that work stress will be positively associated with burnout (Hypothesis 4) in our sample. Beyond its impact on burnout, we expect that work stress will have an impact on work-family conflict within our sample of firefighters. Evidence from multiple studies, including meta-analyses and reviews show work stress as an antecedent and strong predictor of work-family conflict (Byron, 2005; Greenhaus and Allen, 2011; Michel et al., 2011). Although there is adequate literature to support the positive relationship between stress and work-family conflict in multiple industries, this relationship has only been minimally explored in fire service members. Of the limited research in this area, Shreffler and colleagues, in a study focused on firefighting and fathering, found that occupational stress was associated with work-family conflict in a sample of male firefighters that were fathers (Shreffler et al., 2011). We expect a similar finding in our sample of career firefighters and hypothesize that work stress will be positively associated with work-family conflict (Hypothesis 5). Lastly, we hypothesize that work-family conflict will positively predict burnout in our sample of firefighters (Hypothesis 6). There is some limited evidence denoting work-family conflict as an antecedent and predictor of burnout within various occupations (Allen et al., 2000; Amstad et al., 2011). More specialized studies further support this relationship in fields such as law enforcement (Haines et al., 2013), nursing (Burke and Greenglass, 2001) and in some aspects the fire service. Halbesleben (2009) illustrated the positive association between work-family conflict and emotional exhaustion, an aspect of burnout, within a sample of fire service members.

Should our posited hypotheses prove factual, the present study will provide novel evidence of burnout and its impact on safety-related outcomes in the fire service, particularly firefighter safety performance. The inclusion of work stress and work-family conflict within the model is novel as well, as these antecedents are expected to influence firefighter burnout, but not necessarily directly impact the safety performance outcomes. Burnout is expected to be a mediating factor as

burnout is portrayed as an outcome comprised of exhaustion, depersonalization, and cynicism. It is this outcome, which is predicted to influence safety performance.

Ultimately, if proven factual, the present study will illustrate that burnout, as a stress-related process, does negatively impact safety performance. This is important within the fire service as a declination in performance could result in firefighter injuries during line-of-duty operations. Further, the inclusion of antecedents in the model, if found to be predictors of burnout, may provide targets for interventions within the fire service to curtail burnout and its effects.

## 2. Methods

### 2.1. Participants

Cross-sectional data were collected from 208 professional firefighters from a city fire and rescue department located in the south-eastern United States. Prior to collecting data, Institutional Review Board approvals were obtained by the researchers involved in the study and their respective universities at the time of the study. Also, additional approval was granted, following a review procedure, from the Department of Homeland Security Regulatory Compliance Office. Prior to data collection, consent was obtained from all participants. Cross-sectional data were collected online via a Qualtrics survey tool. The overall participation rate was 60%. Firefighters ranged in age from 22 to 60, with a mean age 40.34 ( $SD = 9.29$ ).

Of the respondents, 95% were male. Most of the participants identified their race as White (71%). Others identified their race as Black or African American (20%) Asian (1%), American Indian or Alaskan Native (< 1%) or Other (7.6%). With regard to ethnicity, 4.8% reported their ethnicity as Hispanic or Latino. From this group identifying as Hispanic or Latino, one reported their race as White, two reported their race as Asian and six reported their race as Other. Many of the respondents reported their marital status as married or living with a partner (72%). Others were single (15%), divorced or separated (12%) or widowed (1%). Many of the firefighter participants had completed a college degree. Seventy-two (36.7%) of the members completed an Associate's degree and 21.9% completed a bachelor's degree. A small number of members had completed some post-graduate work (4.1%). Several members completed some college or technical/vocational training beyond high school (31.6%) and several of the members completed high school or earned a GED (31.6%). With regard to tenure in the fire service, the majority have been in the fire service between 4 and 9 years (28%) and 10 to 15 years (25.5%). Less than two percent have been with the department less than one year. Nine percent have been with the department between 1 and 3 years and 16% have been with the department between 16 and 20 years. Slightly less than 15% have been with the department between 21 and 25 years and 11 members (5.5%) have been in the fire service for more than 25 years. Lastly, with regard to rank, the majority of the respondents were frontline firefighters (~49%). Others included company officers (~36%), senior officers (~7%) and those that reported their rank as paramedic (7%).

The department that participated in the present study does fairly well represent the national fire department sample within the United States (Haynes and Stein, 2014). Most firefighters (52%) in the United States are between the age of 30 and 49 (Haynes and Stein, 2014). Our mean age was 40.34 ( $SD = 9.29$ ). With regard to operations and structure, our sample is representative of career fire departments in the United States with regard to the number of stations, number of personnel and operations, particularly for those serving a population between 100,000 and 249,999. The department we surveyed conducts basic and advanced life support, which is similar to most career fire departments. Approximately 62% of career departments in the United States provide basic and/or advanced life support (Haynes and Stein, 2014). With regard to stations and personnel, the department in the

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