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Risk factors for fire injury in school leavers: A review of the literature

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ABSTRACT

Young adults aged between 18 and 24 years make up a significant proportion of those involved in unsafe fire behavior. Despite this, research into this group is sparse. This review suggests that young adults are at high risk for unsafe fire involvement due to their membership in other high risk groups such as renters, crowded housing dwellers, and low socio-economic status groups, and their involvement in high fire risk activities such as alcohol and drug use, and smoking. Young people are also at risk for unsafe fire involvement due to their status as young people and the effect this has on engaging in unsafe behavior. Existing fire safety campaigns are discussed and research into engaging young adults in adopting non-fire related safety behaviors is examined. Factors considered successful at engaging young adults in safety behaviors, including targeted and tailored campaigns grounded in research and theory, youth involvement in development, and the use of humor, positivity, peer influence and social norms interventions, are considered and suggestions are made as to how these could be applied to the development of future fire safety campaigns for the 18–24 year old age group.

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1. The global fire problem

In the United States in 2013, a fire department responded to a fire every 25 s [31]. In the same year there were 1,240,000 fires

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reported in the United States causing 3240 deaths, 15,925 injuries and $11.5 billion in property damage. In Britain, in the year 2012–2013, Fire and Rescue Authorities attended 192,600 fires [19], and in New Zealand, in the year 2012–2013 the New Zealand Fire Service responded to 70,907 emergency incidents, 66% of which were fire related [49]. A considerable number of these fires occur in residential locations with approximately 80% of all fire-related fatalities in the United States [31], and three quarters of all fire-related fatalities in Britain, occurring in residences [19]. One residential fire reportedly occurs every 85 s in the United States [31].

Prevalence is likely even higher due to under-reporting of fire incidents. The United States Consumer Product Safety Commission conducted a telephone survey of residential fires, whether attended by a fire department or not [25]. Participants were asked if they had experienced "any incident large or small … in or around [their] home … that resulted in unwanted flames or smoke, and could have caused damage to life or property if unchecked" (Greene and Andres, p. i). Data was obtained from 916 households that reported experiencing at least one fire during the 90 days preceding the survey. From the results of the survey it was estimated that 7.4 million fires occur each year in the United States; however, only 3.4% of these are attended to by fire departments. This leaves an estimated 7.1 million fire incidents that go unreported each year.

There has been some success in reducing fire incidence both nationally and internationally. New Zealand has seen a 30% reduction in the number of avoidable residential fire fatalities per 100,000 head of population since June 2003 [49]. Fire statistics from the DCLG [19] in Britain note a reduction in fire fatalities of 39% since the year 2003–2004, and of 5% since the year 2012–2013. Furthermore, the United States experienced a 5% reduction in home structure fire deaths in 2011 when compared to 2010 [1]. Even with these improvements, the rate of fire incidence remains alarmingly high. Despite the large reduction in fire fatalities in New Zealand, fire injuries have only been reduced by 14% since June 2003 [49].

Young adults are a particularly at-risk group for fire injury, specifically those in the 18–24 age group [22,50]. Within this group are school leavers, many of whom will be living away from home for the first time. There is concern about the likelihood of fires in and around their residences due to unsafe and uninformed fire behavior. This review will highlight young adults' involvement in fire, as well as the risk factors for fire-related harm relevant to this group. An evaluation of methods found to be effective in engaging young adults to adopt other safety behaviors will also be included, with the goal of presenting suggestions for best practice for future safety campaigns, aimed at this target group.

2. Young adults and fire

There is a growing concern internationally about young adults, specifically university students living away from home for the first time, and their involvement in unsafe fire behavior.

Despite widespread media publication of this issue, there is little research specifically investigating the 18–24 age group and methods of engaging them in safe fire behavior. According to the U.S. Fire Administration [67], between 2000 and 2011 those aged between 15 and 24 years accounted for 13.7% of all fire injuries and 108.6 fire injuries per million. Flynn [22] reported that those aged 20–49 years were most at risk for non-fatal fire injury, and those aged 20–34 were 1.3 times more likely than the general public to be injured in a residential fire. This age group are also 50% more likely to be injured in a cooking incident than the general public [22]. In addition, according to the U.S. Fire Administration [67], between 2000 and 2011, those aged between 15 and 25 years accounted for 5.2% of fire deaths and 8.4 fire deaths per million. While this number may not be as high as for the very young and very old [22,26,68], it still provides clear evidence that this is an at-risk group for unsafe fie involvement.

Research from the United States, in particular, examining university students and unsafe fire involvement provides valuable additional insight into this problem. Although the university population is not necessarily representative of the entire young adult population, this is the best information available to date that specifically examines the target group of young adults between 18 and 24 years. Findings should however, be considered with this in mind. University housing is taken to include college and university residential buildings, dormitories and sorority and fraternity houses.

According to data taken from the United States Fire Administration's National Fire Incident Reporting System between 2007 and 2009, an estimated 3800 university housing fires occur each year and on average 10 students die each year as a consequence of campus-related fires [67]. The Center for Campus Fire Safety [63] report that, since 2000, 87 fatal fires have been recorded on college campuses killing 123 people. Approximately 85% of these fires occurred in off-campus student housing constituting 105 of the 123 deaths.

The above research provides clear evidence for claims that this age group are high risk for fire involvement and are subsequently worthy of further research. While fire safety campaigns have commonly focused on the very young and the very old due to their recognized risk, we argue that a focus is now needed on promoting fire safety with young adults as part of the wider effort to reduce fire-related damage and harm.

The literature suggests that young adults may be high risk due to their likely membership within other high risk groups. Risk factors include the likelihood they may be living in rented accommodation, which may also be crowded; they may have low socioeconomic status; may engage in drug and alcohol use, and smoking; and as "young people" may be prone to risky behavior, including in relation to fire. Each of these risk factors will be discussed in turn below. It is important to note that as the research on this age group and their fire involvement is limited, caution should be taken when considering the relationship between young adults and the various risk factors set out below.

2.1. Status as renters

University age students rarely own the residences they live in, often choosing to rent accommodation throughout their studies. Home-ownership type has been found to be associated with risk of fire fatalities and injuries. Greene and Andres [25] found that households in which fire incidents occurred were more likely to be occupied by renters than owners of the property. While owners had, on average, 24.1 unattended fires for every attended fire, renters had 55.1 unattended fires for every attended fire. Per 100 households, there were 6.19 fires in owner-occupied housing compared to 7.58 fires in rental housing. In their cross-sectional study, Duncanson et al. [20] also found this association in a New Zealand sample with owner-occupied households being at a decreased risk of fire incidents when compared to renter-occupied households. Tenants of rental accommodation were found to have higher rates of both residential fire-related injuries and deaths than owner-occupiers. This difference may be due to differing levels of investment, and consequently commitment to fire safety, that home-owners and renters have in property. This explanation is supported by Greene and Andres' [25] finding that renters were less likely than home-owners to have a fire extinguisher in their residence.