Human response to non-injury accidental house fires

HUMAN RESPONSE TO NON-INJURY ACCIDENTAL HOUSE FIRES

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Abstract

Research on fatal fires and evacuation exercises yield little or no information about how fire victims respond to a real house fire incident where occupants' mental stress levels differ greatly. Drawing upon daily records of fire incidents from the Victorian Metropolitan Fire Brigade and Country Fire Authority, Australia, 182 individuals who had survived accidental residential fires without serious injuries were interviewed. Similar to most literature, this paper found that electrical failure and cooking-related activities were the main causes of non-injury house fires. The smell of smoke was the top listed cue that first alerted an individual ('host' or person in the vicinity). The majority of hosts took proactive actions when facing the threat of a fire, while in only one third of survived fires no attempt to extinguish the fire was made at the time of ignition. This study did not reveal any significant relationships between main activities during a fire and occupant characteristics, however, people with no or only basic fire safety knowledge were more likely to engage in activities such as attempting to extinguish a fire/ collect personal belongings/ rescue pets/ disconnect power source than those who had some level of fire training.

Key words

Non-injury house fires, fire ignition, fire identification, host response to a fire, fire extinguishment

INTRODUCTION

Understanding how people might behave when facing the threat of a fire incident is an important field of research in order to reduce the fire deaths and injuries; however, there is a dearth of studies on human behaviour in residential fires. There appears to be four main research methodologies in human behaviour in fire, including evacuation drills[1, 2], post-fire surveys[3-5], laboratory investigation and computer simulation models[6]. Post-fire surveys are viewed more favourably to collect relatively valid and reliable information concerning occupant behaviour under real fire threat [7-11], in contrast to drill exercises and evacuation studies[4]. The latter type of studies provide so-called 'controlled situations' where occupants' mental stress levels differs greatly from real fire situations where people may be intimidated by the signals of a fire (i.e., smoke, noise), worry about their personal belongings and loved ones including pets. Nonetheless, the very limited number of existing studies on human behaviour in fire using post-fire surveys has predominantly focused on high-rise office buildings.

Over a decade ago, Purse and Kuipers (2004)[11] conducted post-fire interviews with 210 occupants from 98 non-injury building fires which occurred in the UK. This study found that electrical faults in appliances or mains supply and cooking were the most common causes of non-injury house fires. Importantly, Purse and Kuipers (2004) observed that once occupants had received an initial cue regarding a fire, instead of evacuating immediately, they tend to engage in a variety of activities before evacuation, including investigating, trying to extinguish the fire, helping others, calling for help, and/ or gathering personal belongings or pets. Proulx[12] summarized a wide range of factors associated with occupants, buildings and fires that might have an impact on human behaviour in fire. Occupant characteristics cover factors related to personal profile (e.g., sex and age), knowledge and experience (e.g., past fire experience, fire safety training), condition at the time of event (e.g. alone vs. with others), personality (e.g., anxious), and role (e.g., owner). This summary of factors and characteristics provides a big picture and can help better understand human behaviour in fire, but only a very limited number of studies on residential fires have so far empirically tested the possible relationships. Some studies have revealed differences in the ways in which men and women would react to a fire[1, 10]. Generally, men are more likely to engage in firefighting activities while women are more likely to evacuate the building[10].

Extending the literature, this study analyses the information from post-fire interviews about human behaviour in house fires attended by the fire services where no deaths or serious injuries have been involved, and examines behaviour in the time sequence of fire ignition, identification, response, and extinguishment. The two main research questions are (i) how did people behave when facing the threat of a fire and (ii) what factors affect such behaviours? Using both qualitative and quantitative data based on interviews (more detailed than survey data), this paper is unique in its examination of factors affecting people's activities during a house fire. Main activities during fires were compared across different cohorts involving sex (males vs. females), age (adults aged between 18 and 59 vs. older adults 60+), number of people on property (1 vs. 1+), previous fire experience (yes vs. no), fire safety knowledge (no/basic vs. some training), and country born (Australian-born vs. Non-Australian born).

METHODOLOGY

Contact details of potential interviewees were drawn from the daily records of fire incidents which occurred between 2010 and 2012 collected by fire agencies in Victoria, Australia, including the Metropolitan Fire Brigade (MFB) and Country Fire Authority (CFA). Ethics approval was obtained by the Victoria University Human Research Ethics Committee

(HRETH 09/163). Fires were followed up if they met the following four criteria: 1) residential (backyard/frontyard fires were included if they involved a structure such as a garage or shed); 2) accidental (no cases where arson or serious criminal behaviour was suspected or proven were included); 3) no serious injury with extended hospitalisation or death involved; and 4) significant fire and/or smoke damage to the room of fire origin and/or dwelling reported by the fire agency.

The Project Officers, who had been trained in the sensitive interviewing of people who may have experienced trauma, interviewed an adult who was the person most closely involved in the fire start, fire detection or who had escaped from the fire. Initially the potential interviewee was contacted by phone where possible, and the interviews were normally conducted at the interviewee's home, typically where the fire had occurred. The interview was designed both to make the interviewee feel comfortable and to elicit the information relevant to the variables required for the database.

All interviews were audiotaped. The interviewee was asked to read the Information Sheet and sign the Consent Form prior to the time of recording. A specific interview structure was not imposed as it was recognised that consenting participants will want to "tell their story" about the fire event and it is expected that this will occupy most of the first part of the interview. For this reason a series of questions were not developed. Information that was not yielded by the invitation to tell their story in depth was obtained using sensitively framed questions. A Coding Manual that was developed specifically for the Survivors' Database had formed a type of checklist for the interviewer to work through in the final part of the interview after their detailed 'story' has been told. In no case did the interviewee appear to find the interview a negative experience from an emotional point of view, indeed typically the interviewee found the retelling of the event to be a positive experience.

In a minority of cases an extended phone interview was conducted if the person lived at a considerable distance from Melbourne. About two weeks prior to the date of phone interview, an Information Sheet and Consent Form were sent to the potential interviewee and verbal consent was also obtained via the phone before the recording began.

Information about residential fire incidents was received from the MFB from June 2010 to December 2011 and approximately 53% of all the initial fire incidents that were assessed met the above inclusion criteria. Thirty percent of the potential interviewees were not contactable by phone or letter (at least three attempts were always made). Decline rates were quite low at about 17%, and were mostly because the contacted interviewee indicated that he or she had a language barrier to deal with an interview. Finally, 128 interviews were obtained from MFB attended fires. Information regarding a further 153 fire incidents that met the selection criteria was provided by the CFA from January 2012 to June 2012 for areas within about 200 km of Melbourne. Full interviews were obtained from 68 of these CFA-attended incidents (44%). In total, 196 interviews were conducted and from these interviews information concerning 182 individuals who had survived accidental residential fires without serious injuries was used for the current analysis. Fourteen interviews were excluded because of a large percentage of missing data concerning the 'host' (definition of host is provided below). In tabulating the results differences commonly occur in the number of cases across variables owing to information that was missing or not applicable to all cases.

Host

Obviously not every fire incident was started directly by human behaviour. Nor was every contactable interviewee involved in fire ignition. However, in order to fully understand the nature of fire and human behaviour in fire, it is essential to acknowledge the important role of human involvement in ignition. This report utilizes the term of 'host' to refer to the person who was most closely involved in the fire start, detection, or who first called the fire brigade. Whether or not a host was involved in ignition was judged based upon whether a fire was caused by the hosts' direct action or inactions.

In the case of a fire where a person was involved in ignition, for example, a fire that was caused by a person placing combustible furniture directly on top of an electrical cord, this person was called the 'host' and coded as 'involved in the ignition'. Information about such persons, gathered from the interview, is the focus of the research and this person was usually, but not exclusively, the interviewee. For example, where a child was involved in the fire start, such as playing with ignition sources, a parent was interviewed; for coding and data analysis purposes, however, the child became the 'host' and 'involved in the ignition'. As another example, an unattended cooking-related fire was started by a 39 year old man who was living with his mother at the time of the fire and has been suffering post-traumatic stress disorder and schizophrenia. Because of the effect of his mental illness, his mother was interviewed, while information about the son and the fire was gathered. This man was named the 'host' and 'involved in the ignition'.

By contrast, in the case of a fire that was not caused by human direct actions, for instance by electrical failure of house appliances (i.e., electrical wiring, extraction fan, central heating unit, dryer), the host is the person who first detected fire and/or first called the fire brigade and/or was interviewed. This host, however, was coded as 'not involved in the ignition'. Again, this person was usually, but not exclusively, the interviewee. For example, in one case a wife was on the property but her husband was off the property where the fire occurred, and she called her husband who then called the fire brigade. The husband in this case was interviewed because his wife did not feel confident speaking English and did not wish to be interviewed. In this case, information about the wife was gathered from the interview of the husband, and the wife became the 'host' and 'not involved in the ignition'.

RESULTS

The following sections report the findings in the sections of: 1) fire ignition; 2) fire identification; 3) response; 4) location change and 5) fire extinguishment.

Fire ignition

As shown in Table 1, electrical failure was the leading ignition factor of non-fatal/ injury house fires, followed by cooking-related activities. It is notable that unattended cooking behaviours accounted for 75% of cooking-related fires. Kitchen was the main room of fire origin, accounting for about one third of fires, followed by bedroom and ceiling/ roof space.

Insert Table 1 here

Fire identification

The majority of fires were first noticed by a person in the building (84.5%, 153/181), a further 11.6% (21/181) by a person not in the building but on the property, and a 3.9% (7/181)

by person off property. The latter seven fires were mainly caused by electrical failure (n = 4) and combustibles too close to heat (n = 2). Three of these seven fires occurred in the garage, two in tool storage and another two in the bedroom.

Multiple methods of being alerted to the presence of a fire were recorded. In nearly a quarter of cases the fire cue that first alerted a fire survivor was the smell of smoke (23.6%, 43/182), followed by the sight of flames/ glow of fire (19.2%, 35/182). Other often-reported fire cues included that the person heard sounds from the fire, saw smoke, or heard an activated smoke alarm.

Insert Table 2 here

Response: factors affecting main activities during fire

Table 3 lists the main activities undertaken by the hosts during the fire incidents. It should be noted that only the first two activities (based on the time sequence) that each individual undertook were recorded. Sometimes, the activities might have occurred concurrently. For example, a host might have called the fire brigade while investigating the fire. Because all the non-injury fires in this study were fire brigade attended, activity of 'calling fire brigade' was not the focus of current research. Analyses on hosts' main activities during a fire focused only on hosts aged over 18 years of age (thus 18 cases were deleted). In sum, the initial two activities that were most engaged by the hosts were: attempted to extinguish the fire (39.0%, 64/164), trying to alert others (26.8%, 44/164), investigating fire (18.3%, 30/164), attempted to rescue others (10.4%, 17/164), and attempted to rescue pets (9.8%, 16/164).

Sex. As shown in Table 3, most survivors took proactive actions when sensing the signals of a fire. Over a third of hosts attempted to extinguish a fire, over a quarter of hosts tried to alert others, almost one in five investigated for a fire, one out of ten attempted to rescue others and another 10% attempted to rescue pets. Males and females showed similar patterns in most main activities during the fire. The $\chi 2$ test results indicated a statistically nonsignificant relationship between sex and main activities ($p = 0.137$). However, all individuals who were recorded as having behaved 'irrationally' in the face of a fire were females. Irrational behaviour refers to situations where a host's behaviour was so concerning to others at the scene that some restraining behaviour was warranted. One example is a 24 year old female who accidentally ignited the outside furniture with a discarded cigarette. During the fire, she was desperate to find her dog and ran across the fire area several times and eventually she was restrained by the fire brigade. As another example, when the fire was out of control, a mother was determined to put the fire out by herself as she did not have insurance and did not want her house to burn down. At the end, her friend had to hit her and drag her out of the house as she would not listen.

Age. The majority (81.8%, 121/148) of hosts were adults aged between 18 and 60 and a minority were aged over 60 (18.2%, 27/148) (Note-some missing data). The $\chi 2$ test results indicated a statistically nonsignificant relationship between age group and main activities ($p = 0.282$). A slightly higher proportion of younger adults aged between 18 and 59 than the elderly aged over 60 were engaged in rescuing others, partly attributable to the situation that the elderly are more likely to live alone while the younger adults were living with their families ($b = 4.78$, $p = 0.029$).

Number of people on property at the time of fire ignition. Information was available for 144 fires where 20.1% (29/144) of survivors of these fires were alone on the property at the time of fire ignition. The $\chi 2$ test results indicated a statistically nonsignificant relationship (p=0.104). Investigating fires was the second most activities engaged for those who were alone on properties but the third for those who were not alone, after activity of trying to alert others. Notably, 'alerting others (principally neighbours)' was mentioned as one of the main activities by 7 hosts (24.1%, 7/29) who were alone on the property during the time of fire incidents.

Previous fire experience. A disturbing finding was that 81.8% (108/132) of hosts reported that it was NOT their first time to experience fire incidents, however, no significant relationship was detected between previous fire experience and activities during fires (p=0.964).

Fire safety knowledge. Hosts were asked to rate whether they have had pre-existing fire safety-related knowledge, training or practice prior to the fire incident, ranging from no pre-existing knowledge, basic/ general knowledge, some specific knowledge/ learning, to technical/ formal training. Of 130 fires when information was available, over two thirds of survivors (80%, 104/130) reported that they either had, prior to their fire, no fire safety knowledge (5.4%, 7/130) or had only basic fire safety knowledge (74.6%, 97/130), and 20% (26/130) had some or specific training. Of the seven hosts who reported no fire safety knowledge, four were born overseas, 2 were directly involved in fire ignition but only one was asleep (all other six were awake and unimpaired by other conditions). The $\chi 2$ test results indicated a significant relationship between activities engaged during a fire and fire safety knowledge (p=0.019), with a slightly higher proportion of people with no or basic fire safety knowledge being engaged in such activities as attempted to extinguish a fire/ collect personal belongings/ rescue pets/ disconnect power source.

Insert Table 3 here

Country born. Information was available for 135 fires and about one third of hosts were born overseas (33.3%, 45/135). No significant relationship was found between country born and main activities engaged during a fire (p = 0.461). For those who were born overseas, the activities untaken by most hosts were attempted to extinguish the fire (44.4%, 20/45) and investigating the fire (22.2%, 10/45).

Host's location change before, at ignition, during and after fire

There was a noticeable change in terms of hosts' locations before the fire, at ignition, during fire, and after incident. About 43% of hosts were located in the RFO before the fire but this figure dropped to 14.7% at the time of fire ignition. During the time of fire, more hosts went to the RFO who might be engaged in activities such as investigating or attempting to extinguish the fire. Unsurprisingly, the majority of survived hosts were outside of the house of fire origin but on the property after the fire.

Insert Table 4 here

Fire extinguishment

At the time of fire services arrival, 17.6% (32/182) of fires had been extinguished. The majority of fires were extinguished by the fire brigade (77.6%, 142/182), with a minority self-extinguished. In one third of fires, there was no attempt made to extinguish the fire at the time of ignition. Nearly one third of hosts, and over one third of people on premises other than the interviewee, attempted to extinguish the fire. Where an attempt was made to extinguish the fire, one third of cases used water from a container, another quarter attempted smothering, a quarter used a garden hose, and one out of ten used a fire extinguisher. About 6.3% of households adopted multiple methods to extinguish fires.

Insert Table 5 here

Discussion

Consistent with findings generated by both evacuation exercises/studies and post-fire survey[4, 7-11], this study found that instead of leaving the burning property immediately, most people take proactive behaviour when facing the threat of a fire. The leading five activities that were most engaged by the hosts were: attempted to extinguish the fire, trying to alert others, investigating fire, attempted to rescue others, and attempted to rescue pets. In line with these activities, this study found a noticeable change in terms of hosts' locations before the fire, at ignition, during fire, and after incident. Only 14.7% of hosts were in the room of fire origin at the time of fire ignition, but this figure increased to 43.3% during the fire. The engagement in such activities as rescuing others/ pets or collecting personal belongings reinforced the fact that when facing the threat of a fire, most people undertake activities (including irrational behaviours) that are driven by their perceived needs. People do not always follow fire safety training advice of 'get out, stay out, call the fire service out'[3]. Engagement in proactive activities during a fire and the presence in the room of fire origin might expose fire victims to heightened risk of dying or getting injured in a house fire. However, it can be argued that for these fires most people who were involved successfully judged that their proactive actions were safe. In ten cases people were restrained from exposing themselves to danger by others.

Consistent with the above findings, this study also found that in one third of fires, there was no attempt made to extinguish the fire at the time of ignition (Reasons for this were not pursued in this study). Where additional fire safety equipment was available, it was not always used. A decision not to fight a fire may have been the safest and most sensible option, or may have arisen (wholly or in part) from difficulties using the fire equipment, lack of knowledge on what would be safe to do and/or psychological stress when facing the fire (i.e., disorientation, anxiety). It highlights the interesting issue of whether fire agencies should educate and encourage people to use fire extinguishment equipment to fight small fires if they believe it is safe to do so, or to focus on a message of evacuation. Sufianto and Green (2012)[13] raised the controversial idea that a society highly dependent upon the fire services only creates public opinion that the fire service is the only institution responsible for fire safety. However, if occupants are expected to do the right things during a fire, they must be well trained about how a fire can start, develop, and cause damage[12].

Different from post-fire survey studies on high-rise office building fires, this study did not find statistically significant relationships between activities during fire and occupant characteristics including sex, age, number of people on property, previous fire experience, and country born. However, a significant relationship was observed between activities engaged during a fire and fire safety knowledge (no/ basic vs. some/ specific training), with a slightly higher proportion of people with no or basic fire safety knowledge being engaged in such activities as attempting to extinguish a fire/ collect personal belongings/ rescue pets/ disconnect power source. All individuals that had behaved 'irrationally' during a fire were females. Via a post-fire survey of 595 survivors from a high-rise office building fire, Zhao et al., (2009)[4] found significant relationships between human behaviour at the recognition stage (including searching information, discussion with other occupants, alerting other people, calling fire brigade, and fighting the fire) and factors including sex, education level and emergency training. However, Zhao et al., (2009)[4] revealed nonsignificant relationships between activities at the response stage (including collecting personal belongings, instructing others to leave, sheltering in place, carrying out immediate evacuation) and factors including sex and education level, but a significant relationship between activities and emergency training. Comparing with Zhao et al., (2009)[4], the current nonsignificant relationships might be resulted from a relatively small sample size in this study and, perhaps most importantly, a focus on residential fires rather than public office building fires.

Consistent with previous studies[12], this paper found that a smoke alarm was not the cue that had first alerted most fire survivors. Smoke alarm was listed as the fifth cue after the smell of smoke, the sight of flames/ glow of fire, sounds from the fire and the sight of smoke. Furthermore, 81.8% of hosts reported that it was NOT their first time of experiencing fire incidents, although no significant relationship was detected between previous fire experience and activities during fires. Barnett (2008)[14] found that people aged over 18 years of age had approximately a 50% chance of experiencing either an attended or unattended residential fire within their adult lifetime. Future studies would benefit from conducting research on the impact of education on people who have fires repeatedly.

A number of research findings appear to be very similar between Purse and Kuipers (2004, referred to below as PK) [11] that was conducted in the UK a decade earlier and this current Australian-context study (referred to below as X). Kitchen (PK 37% vs. X 34%) and bedroom (PK 17% vs. X 16%) were both found to be the leading two areas of fire origin. Electrical faults was the leading cause of non-injury house fires for both studies (PK 25% vs.

X 35%) and cooking accounted for over a quarter of non-injury house fires in both (PK 28% vs. X 25%). Both studies revealed that occupants almost never leave the burning property immediately, instead engaging in a number of proactive behaviours including but not limited to such activities as attempting to extinguish the fire, trying to alert others/ neighbours, or collecting personal belongings/ pets. Such consistent findings across decades and countries are welcome because they support the validity of the findings and thus increase the value of the information for fire research and community safety messages. Specifically, the findings raise the question of whether fire safety messages should *always* advocate immediate evacuation where there is a fire. Clearly people engage in a range of proactive behaviours, some of which may be quite sensible and/or understandable in the circumstances. The consistent findings about the leading causes of non-injury fires invite a call to action on how to best enhance the prevention of electrical fault fires and cooking fires.

LIMITATIONS

The nonsignificant relationships documented in this study might be partly attributable to the relatively small sample size; it would be beneficial for future studies to undertake similar research with a larger sample size. Given that all interviewees were volunteers, the database used may not represent the whole population that have experienced fire incidents during the interview period. Because limited information was available from the MFB and CFA fire lists about the survivors, a comparison between people interviewed and those non-contactable was not possible. Thus, the generalisability of the present results might be a potential problem. Further, the inherent methodological limitations associated with self-reported surveys should be acknowledged, especially that participants might seek to present themselves in a favourable manner[14].

CONCLUSION

One of the most significant contributions of this study is that it collected information concerning human behaviours in accidental residential fires in the sequence of fire ignition, identification, response, and extinguishment and explored relationships between some of occupant characteristics and activities engaged during a fire. Previous studies on residential fires have relied predominantly on official statistics on fires, deaths, and injuries, but it is not always easy to capture the deceased's behaviour in the absence of eyewitness accounts. Information from survived fires has much to offer educational or preventive programs to inform people about factors and actions that promote survivability. This study found that the majority of hosts took proactive actions when facing the threat of a fire, while in one third of survived fires there was no attempt made to extinguish the fire at the time of ignition. A decision not to fight a fire may have been the safest and most sensible option, or may have arisen (wholly or in part) from difficulties using the fire equipment, lack of knowledge on what would be safe to do and/or psychological stress when facing the fire (i.e., disorientation, anxiety). It highlights the interesting issue of whether fire agencies should educate and encourage people to use fire extinguishing equipment to fight small fires if they believe it is safe to do so, or to focus on a message of evacuation.

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Table 1. Frequency distribution of fire ignition factors

	Percentage (%)	Number (*n*)
Ignition factor (*n*=175) [a]		
• Electrical failure	35.4	62
• Cooking-related	25.2	44
— Unattended cooking	75.0	33
— Cooking other	25.0	11
• Combustibles too close to heat	16.0	28
• Lack of maintenance/ worn out	8.0	14
• Children playing with ignition sources	6.9	12
• Overloaded	3.4	6
• Discarded cigarettes	2.9	5
• Others (i.e., open fire, design fault, lightning, improper start up/ shut down)	6.9	12
Room of fire origin (n=182)		
• Kitchen	33.9	62
• Bedroom	16.4	30
• Ceiling/ roof space	9.3	17
• Toilet/ bathroom	7.7	14
• Garage	6.6	12
• Lounge room	5.5	10
• Laundry	3.3	6
• Veranda/ porch	3.3	5
• Wall cavity/ surface	3.3	6
• Others (i.e., spa room, under house, backyard/ frontyard, carport, rubbish area)	10.7	20

Note. The cumulative percentage is not 100% as multiple activities were recorded.

Table 2. Frequency distribution of fire identification factors

	Percentage (%)	Number (*n*)
Person who first noticed the presence of a fire (*n*=181)		
• Person in the building	84.5	153
• Person on the property but not in the building	11.6	21
• Person off property	3.9	7
Awareness of a fire (*n*=182)		
• Smelt smoke	23.6	43
• Saw flames/ glow (of fire)	19.2	35
• Heard fire/ explosion	15.9	29
• Saw smoke	12.1	22
• Smoke alarm	12.1	22
• Fire started by own action	6.6	12
• Heard voice/ screams	2.7	5
• Multiple	7.7	14

Table 3. Hosts' main activities during fire

	Total % (n)	Sex		Age		Number of people on property		Previous fire experience		Fire safety knowledge *		Country born	
		Male	Female	18-60	60+	One	More than one	Yes	No	No and basic	Specific training	Australian-born	Overseas-born
Main activities during fire	(164)	(64)	(84)	(121)	(27)	(29)	(115)	(108)	(24)	(104)	(26)	(90)	(45)
• Attempted to extinguish fire	39.0	53.1	35.7	41.3	51.9	51.7	41.7	38.9	54.2	46.2	38.5	41.1	44.4
• Trying alert others	26.8	31.3	28.6	28.9	33.3	24.1	25.2	32.4	20.8	26.9	34.6	25.6	2.2
• Investigating fire	18.3	26.6	15.5	19.8	22.2	34.5	15.6	21.3	25.0	22.1	23.1	22.2	22.2
• Attempted to rescue others	10.4	7.8	11.9	13.2	3.7	0	13.9	11.1	8.3	12.5	11.5	13.3	6.7
• Attempted to rescue pets	9.8	10.9	10.7	11.6	7.4	3.4	13.0	11.1	12.5	13.5	3.8	13.3	4.4
• Extinguished the fire	9.1	10.9	9.5	9.9	11.1	3.4	11.3	9.3	12.5	7.7	26.9	7.8	15.6
• Irrational action	6.1	0	11.9	7.4	3.7	3.4	7.8	4.6	12.5	6.7	7.7	6.7	6.7
• Disconnected power source	4.9	4.7	6.0	6.6	0	3.4	6.1	6.5	0	6.7	0	4.4	6.7
• Attempted to collect personal belongs	3.0	4.7	2.4	3.3	3.7	0	3.5	4.6	0	4.8	0	4.4	2.2
• Unable to act	0.6	1.6	0	0	3.7	0	0.9	0	0	0	0	1.1	0
• Trying to extinguish flames on body	0.6	1.6	0	0.8	0	0	0.9	0	4.2	0	0	1.1	0

Notes. The cumulative percentage is not 100% as multiple activities were recorded. * indicates $p < 0.05$.

Table 4. Hosts' location before fire, at ignition, during fire and after fire

Location % (*n*)	Before fire	At ignition	During fire	After fire
Involved in ignition (at exact point of)	-	4.3 (7)	-	-
In RFO	42.7 (70)	10.4 (17)	43.3 (71)	2.4 (4)
In house/ building of RFO but not in RFO	49.4 (81)	67.1 (110)	37.8 (62)	8.5 (14)
Outside of house/ building of RFO but on property	3.0 (5)	6.1 (10)	16.5 (27)	81.1 (133)
Off property of fire origin	1.8 (3)	6.1 (10)	0.6 (1)	4.9 (8)
On property but in separate dwelling	2.4 (4)	5.5 (9)	1.8 (3)	-

Note. – indicates not applicable. RFO indicates room of fire origin.

Table 5. Fire extinguishment

	Percentage (%)	Number (n)
Description of fire at time of fire services arrival (*n*=182)		
• Fire extinguished	17.6	32
• Confined to room of fire origin	53.8	98
• Beyond room of fire origin	28.6	52
Who extinguished the fire (*n*=182)		
• Fire brigade	77.5	141
• Person on premises	10.4	19
• Person off premises	3.8	7
• Interviewee	5.5	10
• Fire self-extinguished	2.7	5
Who attempted to extinguish fire (*n*=182)		
• No one attempted	33.5	61
• Person on premises at time of ignition	32.4	59
• Interviewee	28.0	51
• Person off premises at time of ignition	6.0	11
How attempted to extinguish fire (*n*=120)		
• Water from container	33.3	40
• Smothering	25.8	31
• Garden hose	23.3	28
• Fire extinguisher	10.8	13
• Multiple	6.7	8