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Feature Article

Home fire safety beliefs and practices in homes of urban older adults



Mary-Beth Coty, PhD, RN, Colette McCammon, BS, Carlee Lehna, PhD, APRN-BC*,
Stephanie Twyman, RN, BSN, BA, Erin Fahey, RN, BSN, BS

University of Louisville, School of Nursing, 555 South Floyd Street, Louisville, KY 40202, USA

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ABSTRACT

The purpose of this study is to examine factors influencing urban older adults and develop a thematic analysis of how these factors affect seniors' home fire safety (HFS) beliefs and practices. This was a focused ethnography using participant observation and semi-structured interviews. Additionally, public housing records, cognitive functioning, and general health status were assessed. Individual interviews were transcribed verbatim using a constant comparative analysis. Eight seniors participated in the study. Two main themes described older adults' HFS while aging in place: *the risk associated with the living environment* and *the journey associated with maintaining independence*. All participants experienced HFS challenges such as limited mobility and financial constraints. Participants' general health and cognitive status additionally influenced their ability to maintain HFS. The findings suggest that urban seniors may have diverse HFS environment risks compared with the general population, highlighting the need for older adult focused HFS interventions.

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As life expectancies continue to rise, shifting demographics illustrate the increasing proportion of older adults in the population. By 2060 there will be 92.0 million adults aged 65 and older (double the number today) accounting for over 20% of the total population.¹ Aging in place has become a source of pride among older adults, allowing these individuals to maintain a sense of independence and self-determination while they live in their own homes. Not only do older adults remain in their homes, almost half of those 85 years of age or older live alone.²

Although aging in place is preferable to many older adults, the elderly are at a disadvantage when it comes to home fire safety (HFS) and are at increased risk for burns.^{3,4} Fire prevention education has historically been focused on reaching school-aged children, and it has only been more recently that fire services/departments have recognized older adults as a high risk population for home fires, making this a new focus in fire prevention.^{2,3,5–8} Much of the research addressing HFS in the older adult population has centered on risk factors associated with fire and burn injuries. Studies focusing on burn prevention and risk factors indicate how vulnerable older adults are for unintentional injuries associated with home fires.⁹ Their injuries are more severe and often complicated by co-morbidities, have worse prognoses, and require increased medical care and healing time compared with younger

adults.⁹ Physiological changes such as thinner skin, cognitive decline, and decreased visual acuity, compounded by medications that contribute to cognitive and balance issues, have been found to be contributing factors to fire-related injuries.^{10,11} Mortality associated with post-burn complications is 55% for those aged 60 years or older, as opposed to only 4.5% nationally for all ages.¹¹ Additional risk factors for mortality in older adults include impaired mobility, which may hinder or prevent escape from a home fire, impaired hearing, which may prevent being alerted by smoke or carbon monoxide (CO) alarms, and a lower likelihood of having a working smoke alarm.¹²

Much of the research related to fire prevention education programs for older adults has focused on evaluation of the particular program.^{6,8,13} It has only been more recently that research has begun to focus on assessing fire prevention knowledge and practices in older adults. Shields and associates found in a study of older adults that few of the older adults interviewed provided correct answers related to fire prevention practices.⁹ They concluded that the majority of seniors in their study lacked important fire prevention information that may prove to be essential in protecting them from fire-related injuries.^{6,9} Little research has been done to try and improve fire safety behaviors among older adults and to explore what challenges seniors face when it comes to implementing HFS practices. Because no studies have been found that examined urban seniors' experiences following participation in an HFS program and assessed changes in their HFS practices makes this an area of research that warrants investigation. The purpose of

* Corresponding author. Tel.: +1 502 852 5103; fax: +1 502 852 8783.
E-mail address: colehn01@louisville.edu (C. Lehna).

this study, therefore, was to examine those factors that influence urban seniors via a qualitative approach, and to develop a thematic analysis of how these factors affect seniors' HFS beliefs and practices. Ultimately, the goal is to develop interventions to overcome those challenges.

Fire-education programs are predominantly community based,¹³ often not reaching a subset of the older adult population such as homebound individuals.⁶ Tanner found that only 69% were adequately prepared to respond in the event of a fire in a homebound population with moderately low risk of fire and burn injury.² Diekman et al in their examination of six fire safety education programs for older adults identified the need to access less mobile adults and recommended that fire prevention programs should also take place in residential settings, like older adults homes.⁶ For this reason we included both community-based and urban homebound older adults to participate in this study. This focused-ethnographic study examined urban seniors' experience with participating in a home fire safety (HFS) program and assessed for changes in HFS practices as a result of participation in an HFS program.

Methods

Design and sample

Focused ethnography with participant observation and semi-structured interview methods were used. A purposive subsample of 15 older adults who previously participated in a larger HFS study in Louisville, Kentucky were re-contacted by telephone and agreed to participate in this study. Of the 15 initially contacted, eight participated in the study; all were over the age of 55 [age 55–64, $n = 2$; 65–74, $n = 3$; and over 75, $n = 3$], 75% were female and 50% were homebound Meals-on-Wheels participants (see Table 1). Purposive sampling was used to achieve maximum sampling variation which for this study encompassed age, community versus homebound, and gender.¹⁴

Descriptive measures

Age, gender, race, income, co-morbidity index, fall safety score, and activities of daily living (ADLs) were gathered at the initial assessment. The square footage of participants' home and lot size, year built, and county government property value assessments (PVA) were obtained. Comorbidity indexes were calculated using

Table 1
Demographic and characteristic data ($n = 8$).

Categorical characteristics	n (%)
Gender	
Female	6 (75%)
Male	2 (25%)
Race	
White	4 (50%)
Black	4 (50%)
History of falls	
No	4 (50%)
Yes	4 (50%)
Continuous characteristics	Mean (SD; range)
Age	76 (12; 63–97)
Income	\$16,949 (\$7090; \$7800–\$30,000)
Chronic illnesses	1.9 (1.5; 1–5)
Medications	6.4 (4.3; 2–13)
ADLs	5.8 (1.8; 3–7)
Assistive devices	2.3 (1.1; 0–3)
Clock drawing test (<5 considered normal)	8.1 (1.9; 5–10)
Three word cognitive score	2.3 (0.9; 1–3)

participants' positive answers to presence of cancer, congestive heart failure, chronic kidney disease, chronic obstructive pulmonary disease, diabetes, and rheumatoid arthritis. Fall safety scores were obtained and ADL scores were assessed (see Table 2). All participant medications, their dosages, and frequencies were visualized and recorded.

Procedure

At the time of the visit, after explanation by study personnel, reading of the study preamble, and completion of digitally recorded interview was considered consent. Visits within the home were conducted over a 10-week time span.

Clock-drawing test (CDT) is a universally accepted dementia screening measure, which was given at the second home visit. Using a 10-point scale, scores between six to ten points require no additional dementia screening; scores one through five warrant additional testing.¹⁵ A limitation of the CDT is that it does not discriminate between cognitively intact persons and persons with mild cognitive impairment.¹⁶ Participants were also provided with three words and asked to repeat the words immediately and then in 5 min. The CDT when combined with a Mini-Cog (three word recall; apple, bird, table) showed evidence of increased screening sensitivity.¹⁷ No participant CDT score warranted further evaluation for dementia.

Qualitative interview guide

Open-ended and probe questions were used as recommended by Spradley.¹⁸ Examples of questions asked were: "What was your experience like participating in the HFS visit?" and "What kind of HFS changes have you made in your home (are you doing things differently than before, please tell us about this)?" Although prompted, participant responses did not focus on answering the open-ended and probe questions. Digitally-recorded, home interviews lasted an average of 17.59 ± 4.89 min (range = 12.13–27.52 min). After interview completion, participants were mailed a \$25 dollar gift card.

Data analysis

All digital recordings were transcribed verbatim by one research assistant (RA) and accuracy of the transcriptions was verified by the program coordinator. Any questions or information omitted was checked via telephone call to the participant by the RA. Written summaries for each participant interview were completed after each transcript was reviewed line-by-line with the digital recording. Other relevant information and analytic field notes were

Table 2
Falls risks and ADL's questionnaire.

Falls risk assessment questions	Answers
Are you able to ambulate?	Yes/no
If no, what type of assistive device is used?	(Write answer)
Do you have a history of falls?	Yes/no
If yes, have you fallen within last 6 months?	Yes/no
If yes, how many times?	(Write answer)
ADLs assessment questions	Answers
Are you able to perform your daily tasks?	Yes/no/unknown
Prepare meals?	Yes/no
Housework?	Yes/no
Toileting self?	Yes/no
Feeding self?	Yes/no
Prepare and take your medicines?	Yes/no
Get to and from your appointments?	Yes/no

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