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Home fire safety intervention pilot with urban older adults living in Wales



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ABSTRACT

The purpose of this pilot study was to evaluate the effects of a home fire safety (HFS) education program developed in the US, on improved HFS knowledge and practice in a purposive sample of 12 urban older adults living in Swansea, Wales. Knowledge was tested at baseline (T1), immediately after watching a Video on HFS (T2), and at 2-week follow-up (T3). A majority of the participants were Caucasian ($n = 9$, 81.8%), and female ($n = 11$, 91.7%); their mean age was 78 years old ($SD = 12.7$ years). They had two chronic illnesses ($n = 1.8$, $SD = 1.3$), walked without help ($n = 7$, 58.3%), and lived in a flat ($n = 10$, 90.9%). Knowledge scores (percent correct) changed over time and were significantly different from T1 (46.7%) to T2 (59.2%, $p = 0.04$) and from T1 (46.7%) to T3 (58.9%, $p = 0.04$), but T2 and T3 ($p = 0.94$) scores showed no difference. There is a need for educational HFS intervention programs aimed at this age group. This pilot successfully targeted active older adults living independently in sheltered housing complexes. Further fire safety research is needed with community dwelling older adults living in other types of housing.

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Worldwide, burns are the fourth most common reason to seek medical treatment after motor vehicle accidents, falls, and violence [1]. Burns constitute 5% of trauma workload in England and Wales [1]. It is impossible to estimate the extent of the true numbers of those injured by burns as people do not seek medical attention, are treated by their primary care provider, and are not referred to a burn service [1]. In comparison to England, Wales's burn admissions are higher, ranging from 1.1/1000 to 5.36/1000 [1]. Those over 65 years (men and women) with burns in England and Wales stay in the hospital longer and have a higher rate of mortality than those who were younger (i.e., <16 years and 16–65 years) [1]. The

most frequently reported cause of burn in England and Wales in the 65 years and older age group was flame injuries followed by scalds for men; for women, it was reversed, with scalds followed by flame injuries [1]. Contact burn was the third cause of injury for both sexes [1].

In a case-controlled study of adults aged 45 years and older, compared with non-injured adults those with burns had a higher proportion were socially disadvantaged and had more pre-existing health conditions [2]. Those who died in the burn cohort, were younger at the time of death (median age 76 years, interquartile range 67–85) than those who were not burned [2]. Burn is associated with humoral and cell-mediated

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immunity depression, and increased stress and hypermetabolic hormones [2]. These changes could affect a range of health related conditions (e.g., insulin resistance, sepsis, or infection) [2] and might worsen pre-existing health conditions.

A fire risk model developed in the United States (US) revealed areas of increased potential for fire occurrences in urban older adults. Seven risk factors were identified from the literature as associated with burn for older adults (age: older than 65 years, race: non-white [black], education: below high school, low socioeconomic status, tenure: rented housing, year home built, and home value) [3]. Significant predictors of fire occurrence were percent non-high school graduate, percent population black, and percent older than 65 years [3].

Little is known about how a home fire safety education program intervention used in the US could be implemented in a country with strong emphasis on preventive health care and education programs such as Wales. The purpose of this pilot was to test a home fire safety program shown to be effective in increasing and in retaining of knowledge over time in the US with a sample of urban older adults living in Swansea, Wales.

The pilot study aimed to replicate the US parent study [4] (whether a video intervention improved HFS knowledge over time) in a group of older adults living in Swansea, Wales. We also investigated whether risk factors (e.g., age, chronic illness, activities of daily living [ADLs], and income were comparable to the US older adult sample [4] and how this influenced HFS knowledge scores over time. We hypothesized, similar to the older adults from the US, scores would significantly increase over time and remain significantly different than baseline at T3 but not significantly different between T2 and T3. Participant HFS practices were examined using the modified HFS checklist during home visits and described.

1. Methods

1.1. Design

Ethics approval was gained from the University of Swansea, College of Human and Health Sciences and College of Medicine Ethics Committee. Instruments used in the US [4,5] were adapted for use with older adults living in Wales. The co-principal investigators met to change obvious US wording to a version of English understandable to older adults living in Swansea. At a second meeting, the Community Partnership Officer of Mid and West Wales Fire and Rescue Service reviewed instrumentation (pre-, post-tests, and home fire safety check [4,5]; with the focus of changing wording to be in accordance with fire codes from Wales. He also reviewed the US developed video. A focus group was held with staff from Age Cymru Swansea Bay (community agency providing services to older adults residing in the Swansea area), two older adult volunteers, and the Community Partnership officer. The entire home fire safety program/educational intervention, instruments (pre-, post-test, and demographic information sheets) and video were reviewed, discussed and further revisions were made mainly related to wording.

The video was deemed by all (investigators, Age Cymru staff, and volunteers) too fast, too hard to understand, and

needed to be more focused on older adults' learning needs. No video could be found in the US or England/Wales that met those requirements. The group suggested one of the Co-Principle Investigators (Co-PIs) would explain differences in fire safety practices between the US and Wales prior to playing the video to overcome the identified difficulties.

We assessed HFS knowledge at baseline (T1), immediately following the intervention (T2; recall measure), and a minimum of 2 weeks after the intervention (T3; retention measure). The Home Fire Safety Checklist was used to assess HFS practices and is free for use from the US Federal Emergency Management Agency web site [5].

1.2. Sample

Participants in the study included older adults over 50 years who lived in or around Swansea, Wales. Age Cymru Swansea Bay, a community agency for older adults in Swansea, recruited study participants by posting recruitment posters and by telephoning potential older adult participants. Six recruitment events were scheduled at Age Cymru Swansea Bay over a 2 week time frame. Only one person attended and participated. Another person was recruited by Age Cymru Swansea Bay personnel via the telephone. Her HFS education intervention session was conducted in her home.

One older adult volunteer who participated in the initial focus group for instrument modification suggested we contact the local housing authority warden at her housing complex. As a result of this contact we were able to schedule recruitment sessions at three different housing complexes. One session was cancelled and two were held. From those two sessions, 10 participants were recruited. Two other HFS recruitment sessions were advertised through a university-based older adult group but no one scheduled to attend.

1.3. Instruments

1.3.1. Demographic information

Age, sex, race, income, housing (live in a house or flat; ownership: own, private rented, or housing association rented), year house built, number of bedrooms, whom they lived with status, chronic conditions, history of current smoking, fall safety score, and ADLs score were gathered at the initial assessment via a questionnaire [4]. The disease history uses participants' positive answers to indicate self-reported presence of cancer, heart failure, kidney disease, lung disease, diabetes, arthritis, stroke, hearing loss, and tremors [4]. There is a possible score of 0-9. The fall safety score is based on walking without help, falling within last 6 months, and number of falls [4].

The **Activities of Daily Living (ADL)** score is based on positive answers (yes) to [4]: Are you able to perform your own daily activities? Prepare/cook meals? Self-groom? Housework? Toileting self? Feeding self? Take medicines? Get to and from your appointments? Take prescription medications [4]? Score range from 0 to 9. The final item asked the number of medications taken.

History of previous fires or burn or having an escape plan score is based on a yes answer to [4]: Previously checked home fire safety; previous home fire? Ability to set water heater

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