KEY POINT SUMMARY

OBJECTIVES

An interdisciplinary research team at the University of Missouri conducted this field study. The team is developing sensors for the built environment (currently being tested in the home environment) that detect when falls have occurred or when the risk of falls is increasing.

DESIGN IMPLICATIONS

Detecting both unreported falls and falls with injuries has potential to reduce time to treat the underlying cause(s) of falls. With this knowledge, preventive interventions can be implemented to avoid or reduce costly hospitalizations as well as pain and suffering.

Falls, Technology, and Stunt Actors: New Approaches to Fall Detection and Fall Risk Assessment

Key Concepts/Context

One in every 3 people aged 65 or older falls each year, making falls the most common cause of trauma-related injuries and hospitalizations in older adults and the leading cause of death due to injury. In addition, falls are often the prelude to rapid functional decline, costly hospitalization and rehabilitation services, loss of independence and physical function, and even death. Despite healthcare providers' efforts at prevention, falls among older adults continue to be a critical and costly problem. Clearly, new methods are needed to address this issue.

Reviewer note: Innovative methods were used to explore this persistent problem.

Methods

Using two trained theater stunt actors, the researchers tested a series of falls typically experienced by older adults. They also created a fall test protocol that included a scoring rubric for two nurses to train the actors on actions that would be part of a fall and rate the realism of each fall. The team videotaped the fall testing session so that two other nurses could validate the conclusions of the first nurses' ratings.

Then, based on this expert input, the researchers revised the protocol. Two testing sessions were conducted with the stunt actors: one to assess the fall test protocol and measure the realism of each fall and another to test the sensors under development.

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Findings

In the field test results, the nurse observers rated each fall. In four cases for each actor, the nurses coached, after a fall and had the actor repeat the fall, correcting an approach to improve the realism of the fall. In all corrected falls, both raters scored the repeat fall as a 4 (very realistic). The nurses scored the other falls as very realistic (4). A second set of two other nurses observed the videotaped session of the stunt actor falls and coaching by the expert nurses. These nurses independently scored the falls and validated the findings by scoring all falls a 3 or 4, with the exception of a backward fall that one of the nurses rated a 2 and the other a 3. The average score across all falls by these two raters was 3.5, indicating that the falls by stunt actors were realistic and closely resemble falls by older adults.

Following the field test of the fall test protocol, the researchers were ready to test a variety of prototype fall detection sensors using the protocol in a laboratory setting of a staged home environment.

Limitations

This study is self-described as a field study. Researchers provided good examples of observer reliability.