



KEY POINT SUMMARY

OBJECTIVES

The purpose of this study was to pilot the implementation of the Microsoft Kinect system in an effort to detect and prevent falls in hospitalized patients.

Automated Fall Detection with Quality Improvement “Rewind” to Reduce Falls in Hospital Rooms

Rantz, M. J., Banerjee, T. S., Cattoor, E., Scott, S., Skubic, M. & Popescu, M. 2014 | *Journal of Gerontological Nursing Volume 40, Issue 1, Pages 13-17*

Key Concepts/Context

This study uses Microsoft Kinect motion sensors to detect patient falls in a manner that protects patient privacy and promotes cost-efficiency. The Kinect sensor uses a pattern of infrared light to produce an in-depth and 3D, ghostlike image that can provide information on patient falls while maintaining patient privacy.

Methods

After a feasibility pilot study was conducted to calibrate the Kinect system, a descriptive study was conducted on a progressive care unit chosen for high patient acuity and risk for falls. Kinect sensors were installed in six different rooms and set to record for 24 hours per day. Patients were allowed to opt in or out of the project. While no actual patient falls occurred during the data collection phase, 50 actual falls performed by stunt actors were studied. Not only were falls detected, but engineering staff were able to develop a method of “rewinding” the recorded footage to learn what may have contributed to the observed falls. This information could be crucial in preventing falls in the future.

Findings

Data gathered from the 50 recorded falls were used to learn about events contributing to falls. One hundred weeks’ worth of data were collected from all six hospital rooms to determine a false positive rate of approximately 11 false alarms per month. Information was used to improve calibration of the system and reduce the number of false positives.



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Design Implications

Limitations notwithstanding, this study provides an innovative means of capturing fall data that can be observed both in real time and retrospectively. Information contributing to circumstances that may result in falls can provide insight into healthcare design elements that might be modified. Furthermore, this system is described to be both cost-effective and unobtrusive.

Limitations

Limitations for this study include non-random assignment of patients, small sample size, the detection of false positives, and the lack of actual falls during the study period.