

Lighting for Better Postural Stability and Control in Older Adults

Older adults have reduced visual capabilities due to normal changes that occur to the aging eye, as well as a higher rate of eye diseases. Consequently, falls are of great concern especially during the nighttime, when subjects need to get out of bed and navigate in a dim environment.

Methodology

LRC researchers hypothesized that a novel night-light system that provides good visual and perceptual cues would positively impact older adults' postural stability and orientation under dim lighting conditions. The novel night-light system was built using three linear arrays of amber light-emitting diodes (LEDs) and was attached to a door frame,

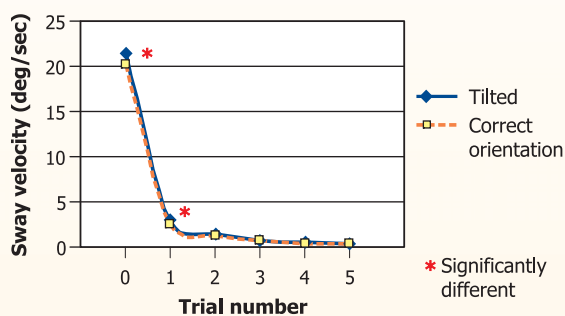


providing subjects with dim to moderate light levels (between 0.1 and 10 lux at the eye) plus horizontal and vertical cues.

To evaluate the effectiveness of this prototype for improving postural stability and orientation, a set of standardized sit-to-stand tests (EquiTest System™) were conducted in eight healthy older adults (age range from 67 to 86 years). Sway velocity and left/right symmetry were used as measures of postural stability and orientation when transferring from sitting to a standing position under various light levels.

Results

The results suggest that visual cues had an influence on both postural orientation and stability: subjects shifted their postural orientation and were less stable when the door frame was tilted than when the door frame was placed correctly with respect to gravity, suggesting that perceptual cues play an important role in maintaining balance when one is transferring from a sitting to a standing position.



Researchers noted significant interaction between sample times and door frame position (correct orientation vs. tilted, both left and right). Post-hoc student t-tests showed significant differences between the two door frame conditions for the first two seconds after standing.

Conclusions

This study has important implications for safety of older adults living at home or in more controlled environments. A night-light system providing visual and perceptual cues can positively impact postural control and stability and can be a tool for reducing falls risks in older adults.

Sponsors

Watt Stopper/Legrand and Wiremold/Legrand

Project Partner

The Sage Colleges, Troy, N.Y.