



KEY POINT SUMMARY

OBJECTIVES

To investigate personal blue light exposure, illuminance levels, and health variables in residential care homes across two seasons to gauge whether or not overall patient well-being outcomes and light exposure rates differ between seasons.

Seasonal Differences in Light Exposure and the Associations with Health and Well-Being in Older Adults Living: An Exploratory Study

Nioi, A., Roe, J., Gow, A., McNair, D., & Aspinall, P. 2017 | HERD: *Health Environments Research & Design Journal*. Volume 00, Issue 0, Pages 1-16

Key Concepts/Context

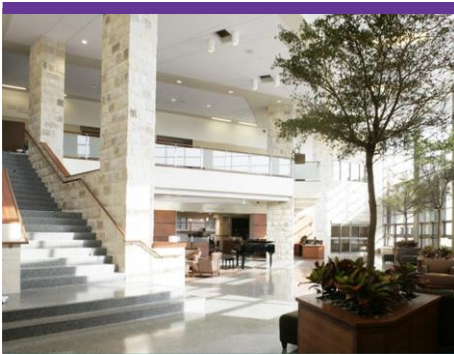
Exposure to appropriate levels of bright light directly affects human circadian rhythms. The circadian rhythm plays a key role in overall human well-being. Previous research suggests that elderly patients within residential care homes are often exposed to low levels of light, which can result in circadian misalignment and irregularities in sleep/wake cycles. Low lighting levels also have been attributed to deterioration in cognitive ability and human visual systems. Within the visible light spectrum, blue light is known to have the greatest influence on human circadian rhythms.

Methods

16 (13 female, three male) participants from six residential homes in central Scotland were involved in this study. Over the course of one summer and one winter season, sleep patterns and well-being outcomes were gathered from all participants. Patients wore two body-mounted sensors to assess personal light exposure over the course of four days while also routinely completing cognitive assessments and visual tests.

Findings

Statistical associations were found between cognitive ability, sleep patterns, visual functions, and low levels of light exposure, regardless of the season. Analysis also found that the patients involved in this study did not receive appropriate amounts of light exposure in either season. Study participants became largely sedentary during the winter, leading the authors to suggest that residential homes work to increase in activity levels among patients during these months.



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Limitations

This study involved a relatively small group of participants within one specific geographical region (central Scotland). Overall participant well-being was assessed through a series of mostly verbal tests; no fluctuations in vital signs or bio-indicators were gathered.

Design Implications

This study suggests that lighting design should incorporate measures of visual health so that an appropriate balance between patient circadian patterns and lighting fixtures can be found. Designers should also carefully consider implementing indoor designs that will help promote physical activity, especially during winter months. In general, designers of residential homes should consider creating structures that maximize useful daylight, allow for ample window access, and facilitate outdoor activities when possible.

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