



KEY POINT SUMMARY

OBJECTIVES

To study the impact of a dynamic lighting system on agitation and rest-activity cycles in patients with dementia.

Implementation of Dynamic Lighting in a Nursing Home: Impact on Agitation but not on Rest-Activity

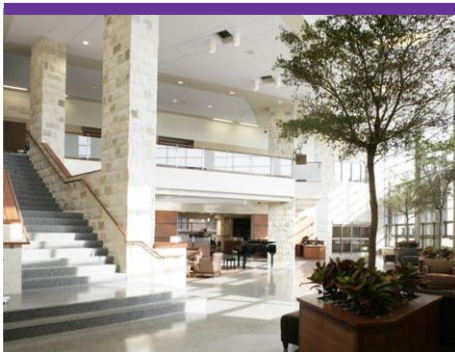
Wahnschaffe, A., Nowozin, N., Haedel, S., Rath, A., Appelhoff, S., Munch, M., Kunz, D. 2017 | *Current Alzheimer Research*, Volume 14, Issue 10, Pages 1076-1083

Key Concepts/Context

A common issue within different subtypes of dementia is nighttime agitation, which often manifests as confusion, aggressive behavior, aimless movement, and general disruption of sleep cycles. Nighttime agitation is the most common cause for nursing home admission, and many medical treatments for the condition only target specific symptoms, sometimes resulting in unwanted side effects for patients. This makes non-pharmacological interventions, such as calculated lighting adjustments, appealing to patients and healthcare providers alike. While abnormal lighting levels during certain times of day can disrupt sleep cycles, a small number of researchers tested ways to tailor the traits of patient lighting fixtures to provide necessary levels of visibility while simultaneously curbing the potential for sleep disruption. One element of focus for these tailored lighting fixtures seldom considered by designers is the correlated color temperature (CCT). The authors of this paper suggest that further research is needed to understand how specialized lighting systems can affect the sleep cycles of patients living with dementia.

Methods

Data for this study were collected in a small psychiatric nursing home over the course of seven months. All 13 nursing home patients who participated in the study had been diagnosed with dementia and were considered physically active (not bedridden). Before the dynamic lighting intervention was installed, each participant completed a Cohen Mansfield Agitation Inventory (CMAI), logged 14 days of rest-activity-cycle recording by wearing an “activity watch,” and logged an additional week of rest-activity recording in a setting with low levels of natural lighting. These procedures were repeated after the installation of the dynamic lighting intervention, and data from the two periods were compared. The dynamic lighting intervention itself consisted of one bright light source for daytime use and one blue



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depleted light source for the nighttime. Both lights were periodically dimmed at fluctuating intervals. Rest-activity cycles were further divided into the variables RA, IS, and IV, where RA is relative amplitude (difference between the most active 10-hour period and least active five-hour period), IS is interdaily stability, and IV is intradaily variability.

Findings

CMAI score assessments revealed significantly lower levels of agitation among patients during the study's intervention period. Analysis of CMAI subscores revealed that patients exhibited significantly lower levels of "physically nonaggressive behaviors." Rest-activity-cycle data proved difficult to rely on, as some participants intermittently removed their activity watches. Analysis of rest-activity-cycle data, both across specific weeks and in its entirety from before and after the intervention, revealed no significant changes. Overall, the CMAI scoring is in line with previous dynamic lighting intervention studies, but the change in "physically nonaggressive behavior" levels is a novel finding.

Limitations

The authors note that the sample size was relatively small and that there was virtually no control condition (in other words, regardless of the dynamic lighting intervention, participants were still affected by lighting patterns in various and perhaps unmeasurable ways). The nurse who completed the CMAI was not blind to the intervention and may have presented a bias. Missing rest-activity-cycle data limited the overall findings of the study.

Design Implications

Dynamic lighting systems within common spaces could include affordable, effective, and subtle ways to promote healthy sleep cycles and reduced agitation levels among psychiatric nursing home patients. The light emitted by these dynamic systems should correspond with the timing of night and day, while also including other, smaller degrees of emission variability within the 24-hour period.

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