



KEY POINT SUMMARY

OBJECTIVES

The purpose of this paper is to present current evidence of how daylight impacts human health and to discuss the relevance of the resulting information to construction and renovation projects.

Daylight and health: A review of the evidence and consequences for the built environment

Aries, M., Aarts, M. & van Hoof, J. 2015 | *Lighting Research & Technology*. Volume 47, Issue 1, Pages 6-27

Key Concepts/Context

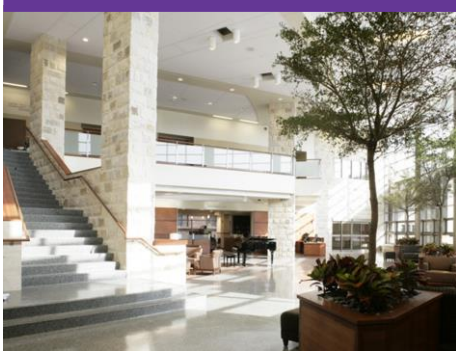
This paper is an overview of studies on the effects of daylight exposure on human health.

Methods

Studies to be included in the review were first identified through a two-step literature search. The first step involved searching PubMed and Scopus databases using keywords such as 'daylight,' 'sunlight,' 'natural light,' 'health,' and 'human.' Secondly, searches were performed using specific health terms. Studies of daylight effects on human health were included and a pre-selection process was used based on the journal title or topic to narrow the search. Data extracted from the included studies included as many of the following elements as were available: studied health effects, light source, illuminance, time or duration of exposure, number of subjects, statistical evidence, and conclusions related to daylight and health.

Findings

Eighteen unique studies met the eligibility criteria for further analysis: one article reported the best sleep timing, duration, efficiency, and quality under natural light conditions; four studies focused on the relationship between daylight hours and physical activity; one article used daylight hours to study the effect on myocardial infarction; one article researched the season of birth with length of day as a variable related to post-partum depression; one article linked the relationship of electric lighting and daylight photoperiod to breast cancer; three studies investigated light in relation to health-related quality of life, self-reported sleep latency, and depression; one article investigated the link between daylight exposure and burnout (a physiological term for the experience of long-term exhaustion and diminished interest); one found that daylight hours influenced salivary cortisol



The Center for Health Design: Moving Healthcare Forward

The Center for Health Design advances best practices and empowers healthcare leaders with quality research that demonstrates the value of design to improve health outcomes, patient experience of care, and provider/staff satisfaction and performance.

Learn more at
www.healthdesign.org

levels; the final articles focused on health associations. Health associations noted included positive association with vision and sleep quality, and reduction of depression, myopia, eyestrain, ADHD (attention-deficit/hyperactivity disorder) prevalence, and SAD (seasonal affective disorder) depressions

Limitations

This literature review was limited to daylight and did not address issues related to gender, photoperiod sensitivity, and daily or monthly rhythms. Potential health interaction effects and interactions related to electric lighting also were not addressed.

Design Implications

In spite of the focus on creating natural light in building spaces, there is only limited statistically significant evidence linking daylight and health consequences. Fortunately, links to specific health conditions were noted but further research is needed in this area. Recommendations for including daylight related to building design include the following:

- Create daylight openings that can be opened to allow occasional exposure to the full radiation spectrum.
- Design buildings with floor plans that stimulate people to go outdoors.
- Aim for rooms with relatively high daylight levels and provide automated, controllable sunlight and luminance protection (blinds, screens, etc.) on all daylight openings; however, users should be able to override the automated control at all times in order to meet personal comfort and health criteria.
- Especially in periods with sunrise and sunset during work time, the daylight opening should be uncovered to expose people to the change in photoperiod.

Apply glazing that allows the transmittance of full-spectrum light in order to provide indoor lighting with all parts of the visual spectrum represented so interaction effects between different wavelengths and intensities can occur naturally and undisturbed.

The Knowledge Repository is a collaborative effort with our partners



Additional key point summaries provided by



RESEARCH-DESIGN
connections