SYNOPSIS

KEY POINT SUMMARY

OBJECTIVES

The purpose of this study was to see if patients in a home-like environment like a group home experienced less cognitive decline than patients who lived in a long-term care facility.

DESIGN IMPLICATIONS

Although the specific renovations made to the new LEED-certified facility were not detailed in this study, it is apparent that the shift towards greener technologies had a positive overall impact on energy and utility efficiency. The movement towards more eco-friendly technologies and practices may have helped attract the new personnel and incite the changes in the hospital's culture that the researchers attribute to many of the other improvements mentioned.

Building design and performance: a comparative longitudinal assessment of a children's hospital

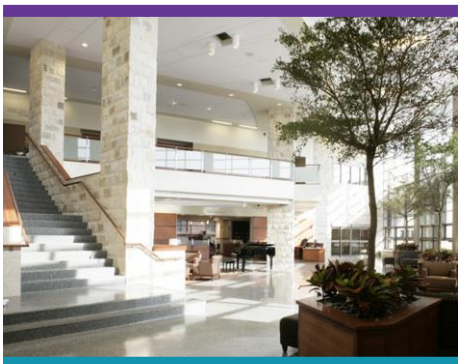
Thiel, C. L., Needy, K. L., Ries, R., Hupp, D., & Bilec, M. M. 2014 | *Building and Environment* Volume 78, Online Publication, Pages 130-136

Key Concepts/Context

The aesthetics and design of a medical treatment facility can influence energy consumption, staff performance, and patient recovery. Evidence-Based Design (EBD) has been cited in many studies as an effective way to improve healthcare outcomes and hospitals' performance, but further investigation is needed. This is particularly true at a whole-building level, to reveal the relationship between building design and health, and to observe the performance of newer building designs, especially with regard to green healthcare buildings. The opening of a LEED-certified U.S. medical campus in 2009 presented a unique opportunity to analyze the performance of a new medical treatment facility and the effects of green design on its occupants.

Methods

- Prior to the opening of the LEED-certified hospital, researchers worked with the hospital's management team to create five categories of metrics for analysis: expenses, productivity, quality of care, utilities, and staff satisfaction. Hospital managers provided data collected from 1999 to 2012 on monthly, quarterly, or yearly bases, depending on the metric. All monetary data were normalized to the value of the 2009 U.S. dollar, and all utility data were normalized using factors of cooling degree days, heating degree days, floor area, number of patient beds, and number of patients occupying a bed for a month-long period.
- Metrics were divided into two sets: "Pre-move" data collected before 2009 and "post-move" data representing the new hospital's performance.
- Key staff members who had knowledge of the hospital's inner workings during the 1999 to 2012 period were interviewed to gather further information on outlying statistics and sudden time-based variations in operations.



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Findings

Although raw electricity consumption increased by about 70%, the 300% increase in the hospital's size translated into a reduction of electricity consumption by about 50% per square meter. Similarly, with water usage, there was an increase by 43%, but a decrease by more than 60% when adjusted for square meters. With heating, there was a 97% increase in Mega-Joules consumed monthly, but a 47% decrease when adjusted per square meter. Sewage and water intensity decreased by over 60%. Electricity needs were reduced from 821 kilowatts per square meter per year in 2007 to 327 kilowatts per square meter per year in 2012. No significant changes were found in surgical and medical supply expenses despite a 15% input capacity increase. There was a 25% decrease in employee turnover and a 5% increase in employee tenure. The new facility also saw in increase in the amount of time spent directly with patients by 10%. The actual mortality rate (actual mortality divided by expected mortality with a number less than 1 as the goal) decreased by almost 20%.

Limitations

The authors noted several limitations within the study. The length of the study period reduced the researchers' ability to isolate metric changes that were influenced specifically by design-related and building sources. The hospital's policies, leadership, and programs changed significantly over the study period, which undoubtedly affected the study's data. The effects of the U.S. economic recession, which occurred during the study period, was not addressed in the study and may have influenced employee turnover. Because a whole-building analysis approach was used, specific design changes and their effects could not be deeply investigated.

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AIA Academy of Architecture for Health of the American Institute of Architects

ASHE American Society for Healthcare Engineering, A personal membership group of the American Hospital Association

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