The Impact of Daylight and Views on ICU Patients and Staff


Key Concepts/Context

The physical environment has been found to have a significant impact on patient, family, and staff outcomes in healthcare settings. The impact of the design of intensive care units (ICUs) may be particularly significant in light of the levels of stress experienced by staff and the vulnerability of families and patients.

Objectives

This study aims to investigate the impacts of daylight and view on the outcomes of ICU patients and staff through a pre-test/post-test study in an old ICU and a new ICU, which were attended by many of the same staff (approximately 75%). The goals were to test the following hypotheses:

- Average perceived patient pain level in the new unit is less than the average perceived pain level in the old unit.
- Average patient length of stay in the new unit is less than the average length of stay in the old unit.
- The annual total of medical errors in the new facility is less than the annual total of medical errors in the old facility.
- The annual total of hours of absenteeism in the new unit is less than the annual total of hours of annual absenteeism in the old unit.
- The mean vacancy rate in the new unit is less than the mean vacancy rate in the old unit.
- The light levels and window views, independent of the unit (bedrooms within each unit had varying light levels and window views depending on orientation), had a positive effect on patient and staff outcomes.

Methods

Using a pre-test/post-test quasi-experimental study in two New Hampshire ICUs, the impact of daylight and window views on patient pain levels, length of stay, staff
errors, absenteeism, and vacancy rates were examined. One ICU was operational until 2007, the second opened in 2007. ICU patients were randomly selected from cardiac surgery, pneumonia, and chronic obstructive pulmonary disease admissions of one or more days, 58 from the old ICU, 52 from the new. Regular medical staff members assigned to the unit between October 2006 and September 2007 (old unit) and March 2008 and February 2009 (new unit) were included.

Findings
Comparing light levels independent of ICU assignment supported the hypothesis that increased light levels reduce pain perception and length of stay, but the relationship was not statistically significant. Another trend that was not statistically significant was that view was associated with perceived pain reduction. A decrease in incident filings supported the hypothesis that improved natural light and views reduced errors, but results were not statistically significant. Mean absenteeism per person decreased from 38 to 23 hours from the old unit to the new. Average vacancy rates decreased by 25% (from 10.12% to 7.49% staff openings per year) in the old and new units.

Limitations
Some limitations identified by the authors include:

- Self-reported pain scales may not accurately reflect pain levels.
- Confounding variables introduced by field conditions. Although 75% of the staff was the same in both units, protocols change over time, which can influence patient and staff outcomes. In addition, changes in light levels, walking distances, color, and acoustics could have affected the outcomes.
- In this study light levels were measured when blinds were fully open. In practice, occupants may close blinds to avoid glare and contrast.