



## KEY POINT SUMMARY

### OBJECTIVES

The study examined the correlation between the length of daylight exposure and the prevalence of hospital nurse medication errors.

### DESIGN IMPLICATIONS

The study shed light on how daylight may help prevent nurse medication errors in hospitals located in far north even though further research is needed to examine whether the relationship is valid in other geographic areas.

The benefit of daylight in preventing errors warrants attention from designers of healthcare facilities.

Environment design features such as light shelf may impact the amount, the quality, and the timing of daylight available in healthcare settings especially nurses' work environment.

## A Seasonal Pattern of Hospital Medication Errors in Alaska

Booker, J. M., Roseman, C.  
*1995 / Psychiatry Research*  
*Volume 57, Issue 3, Pages 251-257*

### Key Concepts/Context

Reduced amount of daylight exposure in fall and winter time in far north may cause symptoms of seasonal affective disorder (SAD) including sleep difficulty, depressed mood, fatigue, and impaired work performance in healthcare professionals. SAD is a type of depression usually occurring at certain time of the year (late fall and winter) and can be treated by light therapy that uses very bright light mimicking sunlight.

Reduced daylight exposure as well as SAD may result in high prevalence of medication errors in nurse during winter time. However, the relationship between daylight and medication errors had not been examined before this study. Previous research indicated that the risk of nurse medication errors might be impacted by other factors including work load and work shift. These factors should be considered in examining the impact of daylight on medication errors.

Other existing studies found multiple benefits of daylight in other areas—reducing stress, reducing pain and pain medication usage, shortening patient length of stay, increasing staff job satisfaction, and so on.

### Methods

A correlational analysis was conducted on retrospective data. The medication error rate for each month in the five years from 1984 to 1989 at a 140-bed acute care hospital in Anchorage AL was calculated based on existing nursing quality assurance records. Since 1982, a standard error reporting form had been used to document errors reported by staff members who committed and/or discovered the errors. The average hours of daylight and darkness per month was calculated based on data from public weather services. In addition, nine potential confounding variables related to work load and work shift (e.g. percentage of nursing positions vacant, percentage of new nurses, number of overtime shifts, number of admissions,



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number of inpatient days) were extracted from hospital records. A multivariate analytic technique called Poisson regression was used to examine the effects of daylight on medication error rate while controlling the potential confounding variables.

## Findings

A delayed effect model most closely matched the actual seasonal pattern of medication errors. In this model, the monthly medication error rates were significantly associated with length of daylight/darkness two months earlier. For example, the number of medication errors in February was best predicted by the length of daylight in December of previous year. This relationship remained significant after controlling for other factors found to be correlated with medication errors, including the number of shifts worked by temporary staff, the number of patient days, and the number of overtime shifts.

## Limitations

There were several aspects of the study that may limit the validity and generalizability of results.

- The study proposed SAD as a mediating factor that may be influenced by the daylight conditions and contribute to nurse medication errors. However, only a small proportion of nurses might be adversely affected by shorter length of daylight to the extent of developing SAD. The proportion of high risk staff was not measured and might have varied over the five-year period. Further, the proposed mediating effect of SAD could not be verified in the study because it was not measured.
- The study was conducted in far north. The results may not be readily applied to lower altitudes.
- Self-reporting might have underestimated the error rate. This might also bias the results.