Troublesome Night Lights: The Negative Effects of Constant Artificial Light at Night

Most college campuses are well lit in order to accommodate late-night study sessions and/or nights filled with youthful pursuits. The increased use of artificial, blue-light based light is causing an unexpected cascade of repercussions. In the early 2000's, artificial light began polluting the pristine night skies, masking the beautiful stars with its bright haze. Unfortunately, the negative side effects of rampant light pollution have gone beyond spoiling the views of the galaxy. The unchecked advancements in brighter lights are costing college students precious hours of sleep, including St. Olaf College students.

St. Olaf College advertises that "Environmental responsibility and sustainability are part of the fabric of St. Olaf College." The environmental consciousness of the community is most noticeable in its strides to limit its carbon footprint and maximize its wattage hours. Recently, the school switched over to energy efficient LEDs from incandescent light bulbs for their outdoor campus lighting. These newer blue-light-based LEDs align well with the college's eco-friendly stance and are a more cost efficient alternative. However, implementing these new and "better" lights has cost the college community in other ways.

The old incandescent lamp posts gave off a dim, warm, orange glow that lit up the pathways sufficiently. The new LEDs give off a white beam that blankets the pathways and stretches towards nearby buildings. The brighter beams of light are penetrating into some student dorms, disrupting overall sleep quality. We must keep in mind that human health, and sleep in particular, is a crucial resource just like electrical power. St. Olaf College may have minimized the use of electricity, but they've done so at the cost of their students.



Every dorm on campus is surrounded by a multitude of lamp posts that light up the walkways. The bright LEDs are close enough for their light to trespass into students' living quarters and act as unwanted nightlights. This constant source of light throughout the night can be detrimental to proper sleep hygiene.

In 2013, Jounhong Cho and his team at Sungkyunkwan University School of Medicine ran an experiment about the effects of constant light during the night on sleep quality. They gathered ten volunteers ranging from the ages of 21-34 years old and who did not have any previously diagnosed sleeping disorders. Cho subjected the group to a two-week sleep study. Of the ten participants, five slept one meter away from a dimly lit fluorescent bulb for a week while the other five slept in complete darkness. After seven days of analysis, the two groups switched lit versus non-lit environments (Cho et al., 2013). Data was collected for different sleep variables like percent of time spent in NREM sleep, REM sleep, slow wave sleep, etc.

Cho observed drastic shifts in slow wave sleep duration, wake after sleep onset percentage, and percentage of arousal. The percent of time spent in slow wave sleep decreased drastically when the lights were on. According to



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Matthew P. Walker (2009), slow wave sleep is crucial in memory consolidation. Proper amounts of slow wave sleep help increase memory retention as well as memory acquisition. These are two crucial skills that every college student needs. In the Cho study, frequency of waking after sleep onset and sleep arousal increased, meaning the participants woke up more frequent within an hour of sleep onset. Increased arousal disrupts normal sleeping patterns (Cho et al., 2013). Even though participants may have slept for similar amounts of time, the quality of sleep was drastically altered by the presence of light.

A plausible solution is for students to simply close the curtains in the room. However, the curtains present in the majority of dorm rooms are old and inefficient. They do a very good job at blocking out the light. In fact, they do too good of a job. The rooms' air quality is noticeably more stale and warm when the curtains are shut compared to when they are opened. This is especially noticeable in the fall and spring months when it is customary to keep windows open. The old fashioned curtains block out the light,



dorm rooms. Photographed by the author (2019)

but they also block crucial air flow needed to keep the room well ventilated.

St. Olaf College has prioritized electrical efficiency over students' health and sleep. The effects of the new blue-light-based LEDs may even go further than impacting students' health. Student organizations, like the Environmental Coalition and Environmental Engineering, can take action by doing further research into the the detrimental effects of light pollution.

## References

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