

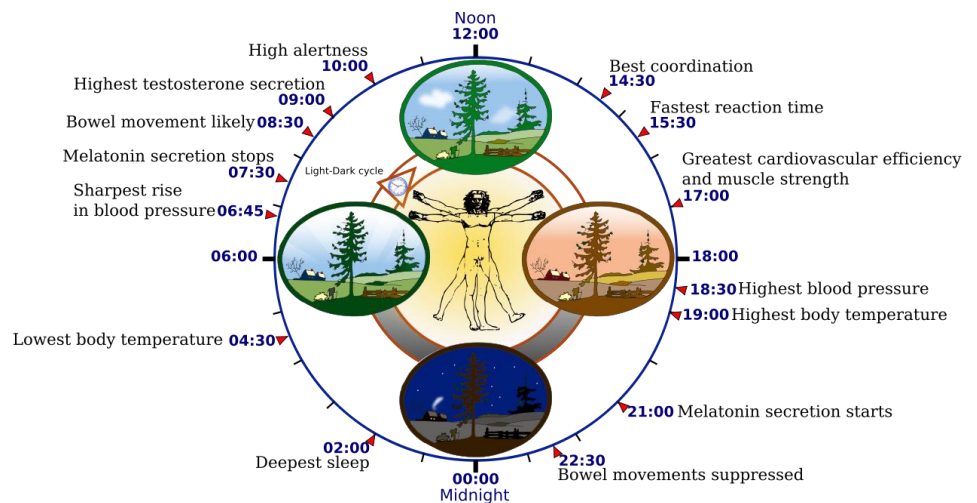
The Interconnection of Light, Vision, Safety, Circadian Rhythms and Sleep

Dr. Asha Hegde, Principle Researcher; Alyssa Myers, Graduate Assistant
School of Family & Consumer Sciences,
College of Applied Arts, Texas State University

Light plays an important role in our everyday living, especially with regards to vision and health. As one gets older, vision is impaired due to the thickening and opacity of the lens which impacts the way one sees their surroundings as well as their safety within the home or any other space that they are visiting, such as restaurants, hospitals, or stores. To compensate for this, higher light levels without glare are needed for the older adult compared to the younger.

With regards to health aspects of light, there is abundant evidence that daylight and electric light directly impact the circadian rhythm and sleep quality of all individuals, especially the older adults.

The circadian rhythm is a 24 hour cycle that uses light to regulate body functions. The Wikipedia image shows the 24 hour cycle and the various biological functions being regulated.



https://en.wikipedia.org/wiki/Circadian_rhythm

Understanding that light

plays an important role in the person's visual as well as biological circadian

system, Dr. Hegde and her team from Texas State University conducted a research study to assess the existing light conditions of independently living elderly people in public housing and how this relates to measures of health, wellbeing, safety, and quality of life. Starting in September 2018, the researchers presented the topic of lighting to the residents of 'Springtown Villa' and answered questions regarding participation in the study which was commenced in October 23 and lasted through December 18, 2018. Thirty residents volunteered to participate in the study. The researchers visited each resident and interviewed them about their lighting usage in the home, and took several light measurements in their dining, living, kitchen, bathroom, and bedroom spaces. Participants also wore the 'ActiWatch' for 6 days to record the amount of light received as well as their sleep and activity levels. Each resident received a \$50 gift card to HEB as a "thank you" for their participation.

Preliminary results indicate that the light levels are high in the Springtown Villa homes which enable the older person to see well. However, the researchers are analyzing the *quality* of light based off the resident interviews and light usage as well as the ActiWatch and sleep log data

which when completed will be shared with the residents and SMHA administration. The goal is to not only give a complete picture of the light *quality* and *quantity* with regards to health and safety within Springtown Villa homes, but also to provide several suggestions to improve the quality and wellbeing of the older adults in public housing not only in San Marcos but throughout Texas.

Good lighting—both quality and quantity, has a strong connection with vision and safety as well as circadian rhythms and sleep. High light levels that are glare free leads to a good visual environment which in turn leads to a safe environment for the residents. Similarly, healthy light that uses high levels of white light during the day time with low levels of warm light in the evening and night time help regulate one's circadian rhythm and sleep, while positively impacting health.

Would you like to improve your home safety and health (circadian rhythm)? Here are some general tips:

General tips to improve safety in home environments:

- Have a clutter free home
- Have high light levels in task areas such as the kitchen, bathroom/grooming area, shower, and any area where you read or do crafts.
- Eliminate any loose floor materials such as throw rugs
- Provide adequate contrast between surfaces (ex. Sofa should be distinguishable from the floor/carpet material)
- Have controls and switches that have multiple settings (high, medium, and low)

General tips to improve one's circadian rhythm:

- Open blinds during daytime to allow sunlight to come in
- Go outside! Take morning walks
- Don't sit in the dark during daytime
- During the evening, keep the light level low, preferably turn on warm looking lights rather than white lights
- Sleep in total darkness (for safety reasons, keep a small night light in the bathroom area)
- Avoid watching TV or using your phone when trying to fall asleep
- Go to bed and wake up at the same time each day

Note: Dr. Hegde can be reached at 512-245-2418 or by email at ah16@txstate.edu if you have questions or comments.