

Savant Zorg Ameide – De Mert & 't Gengske

Healthful Environments | Group 5

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Relevance of light exposure

- the internal biological clock uses light to adjust
- exposure to bright light and blue light on different times of the day can cause a delay or advance in phase, leading to a shift in the circadian rhythm
- blue-enriched white light in the morning can increase cortisol levels, contributing to greater alertness and improved functioning
- light exposure at the wrong time of day can lead to a disruption of the circadian rhythm, negatively affecting the quality and duration of sleep
- mood, cognitive performance and risk of health issues are influenced by sleep quality and duration

Data and insights

- the resident does not receive more than 867 lux (during the entire measurement)
- during awake hours an average of 131 lux is received
- the resident does not receive enough light throughout the day, especially during the mornings (the red dotted line shows the recommended amount of light)
- Melanopic Equivalent Daylight Illuminance (EDI) Quantifies the impact of the emitted light on our non-visual systems, specifically their impact on the circadian system (useful when comparing the effectiveness of artificial light sources to natural daylight)

Concept and advise

Daylight hanging lamp

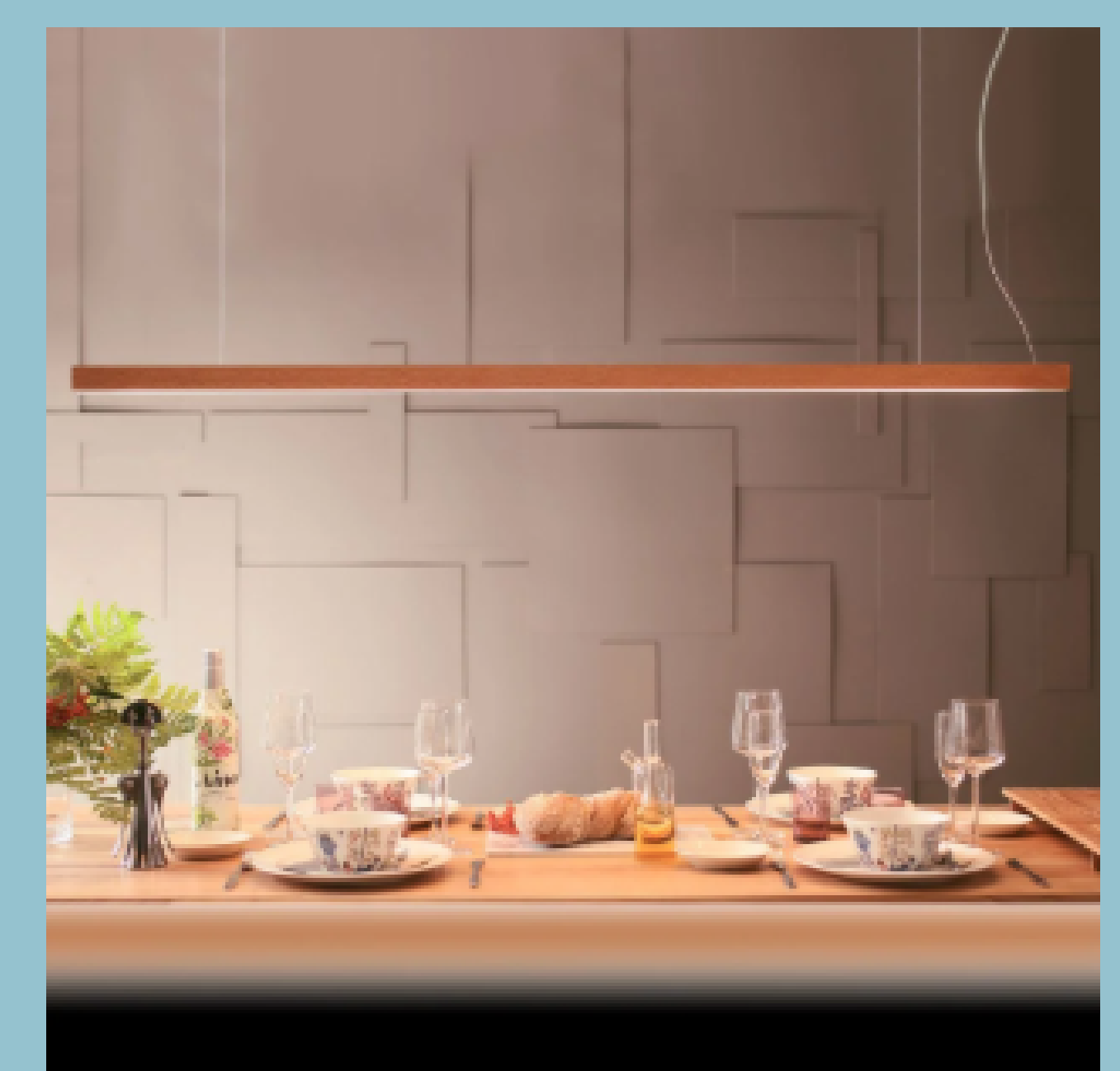
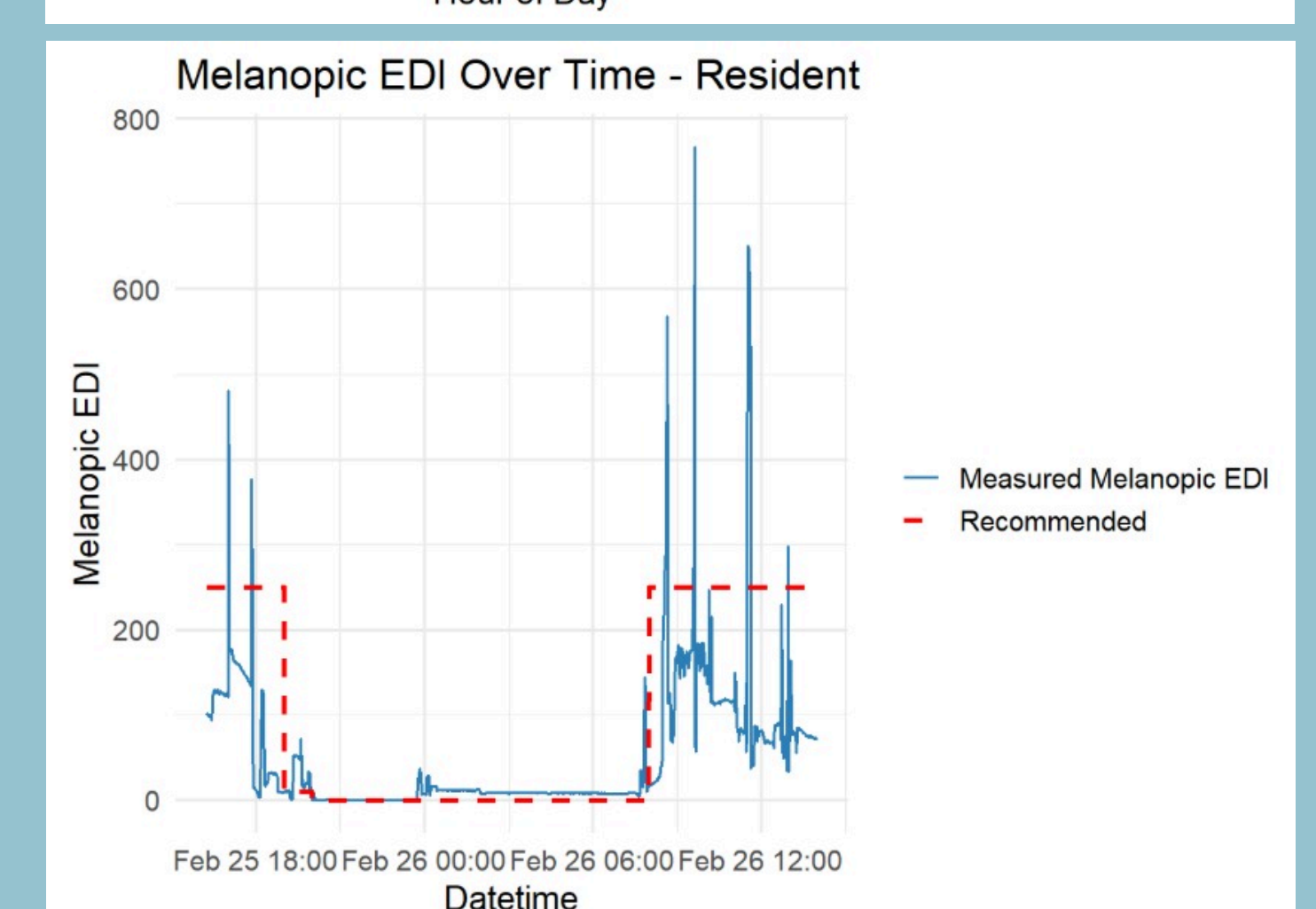
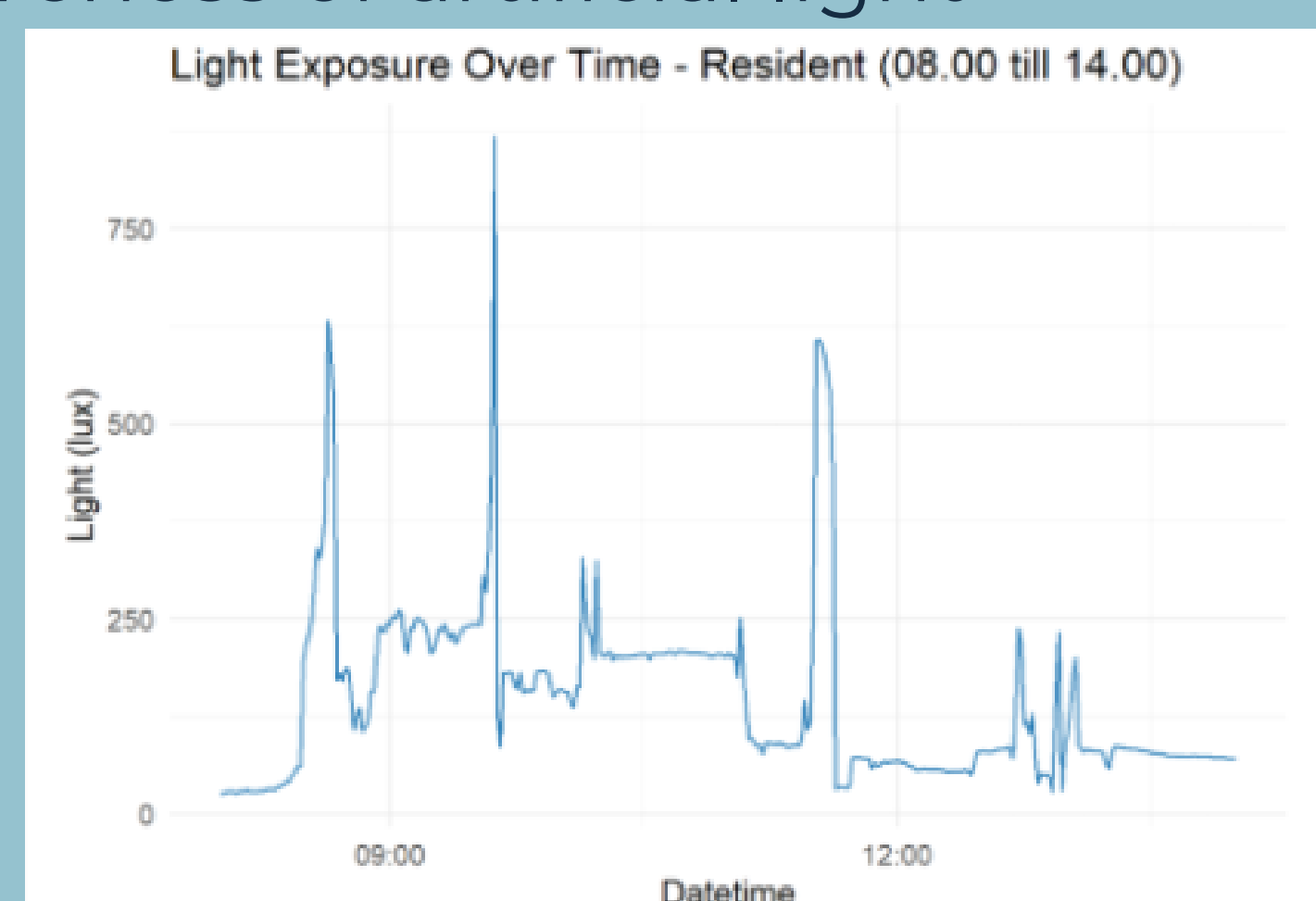
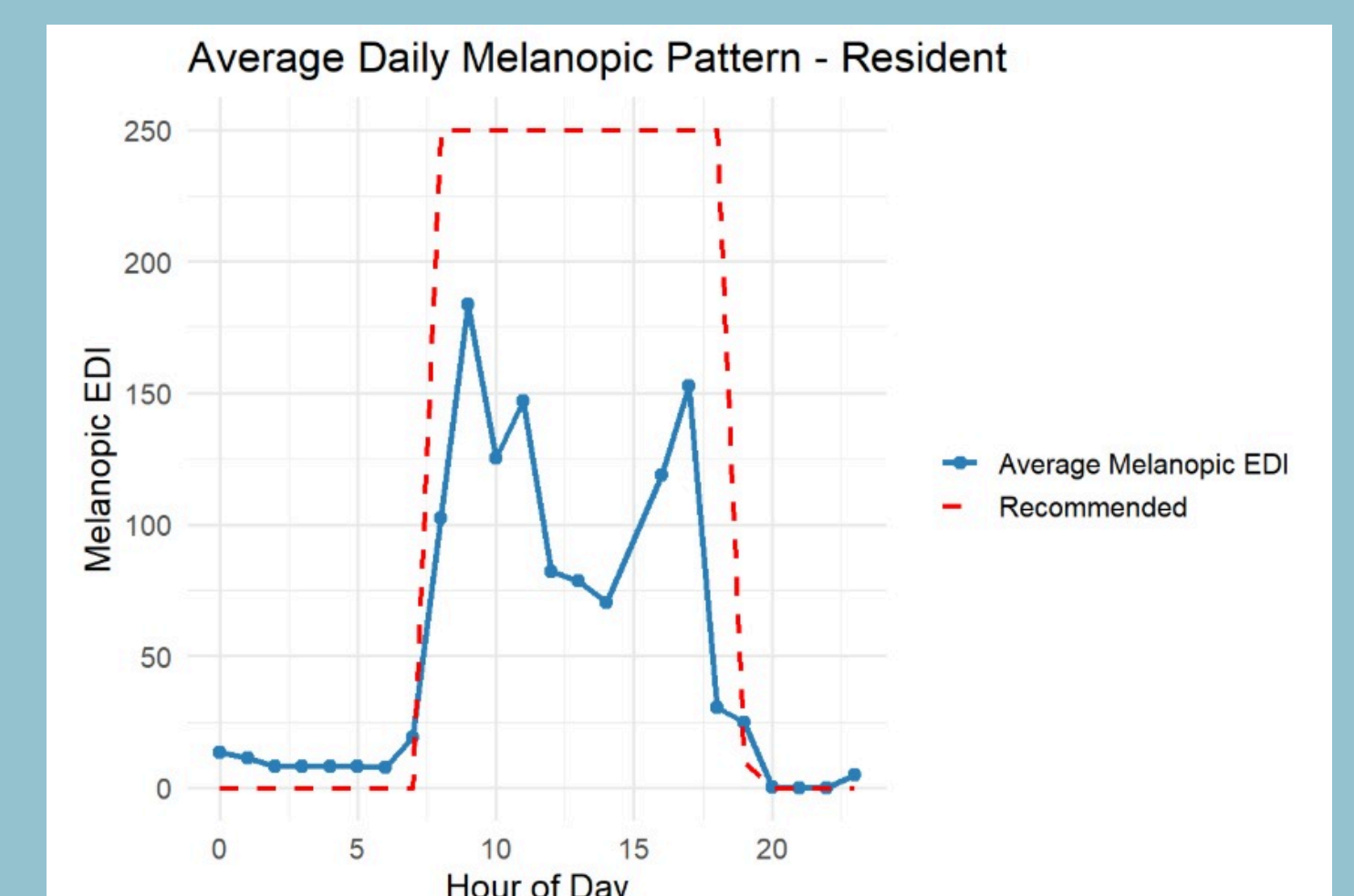
- more and brighter light in the morning helps waking up better, getting more energy and improving the day and night rhythm, as well as the natural wake response
- in the evening light needs to be reduced to prevent a phase delay to the circadian rhythm
- needed because current cues like meals and light are not sufficient for residents to maintain a good circadian rhythm
- using the hanging daylight lamp in the mornings, which is brighter than regular lights, increases cortisol levels and lowers melatonin levels (increased awakesness and lowered sleepiness), stabilizing the circadian rhythm of the residents
- the hanging lamp is chosen since residents cannot take the lamp and hide or break it

Protocol

- employees at Ameide use the curtains and lights to give day and night cues for the residents
- from interviews we noticed that the employees have different ways of handling the lights and curtains, making the cues less stable and impactful for residents
- we created a time schedule for employees regarding the lights and curtains in the common room, giving the residents a stable daily pattern in their light exposure
- it also contains some advise on light during naps and light in personal rooms, to prevent disturbance in the circadian rhythm due to naps

The challenge at Ameide

- **goal:** improving the circadian rhythms of the residents using light
- in people with dementia, increased daylight exposure can also enhance their ability to recognize daytime, reducing confusion about whether it is time to sleep
- current lighting conditions can be disruptive to the circadian rhythms of the residents
- the lighting offers day and night cues for the residents, but these cues are manipulated by artificial lighting and natural light blockers
- blue light (from the daylight lamps) suppresses melatonin production and can lead to an increase in cortisol, causing residents to have more difficulty relaxing and sleeping well



<https://houwelinginterieur.nl/product/tunto-led40-hanglamp/>