

Abstract

Many actions we observe in nature show some kind of regularity, therefore we call them rhythms. Rhythms with a period of approximately 24 hours, so called circadian rhythms, can be distinguished in many physiological processes, with the sleep-wake cycle being one of the most prominent ones. Light is the main exogenous circadian synchronizator and thanks to the circadian rhythm influence on physiological function, it's also often spoken about an influence of light on the entire organism. Nowadays, when we spend most of the day indoors under artificial light, we often suffer from a lack of natural daylight and its synchronizing potential. This is even more prominent in elderly population living in nursing homes and in other social facilities. Lately, a new type of lighting, so called biodynamic, has been introduced. Biodynamic lighting can simulate changes in natural light conditions throughout the day and therefore partially compensate for the lack of natural daylight we suffer from, and also minimize risks of the night light. In this study we aimed to test changes in the circadian system of seniors living in the Retirement Home of TGM in Beroun using questionnaires and circadian markers. We have shown a positive effect of the installed biodynamic lighting on our participants' circadian markers and mood, but also on their life comfort and better safety and orientation during the night. With our study we have opened a new field for further research on physiological effects of a good quality lighting and its potential to improve circadian functionality, cognitive performance and sleep quality. Together with these findings we have also shown a new way to improve life conditions not only in social facilities.

keywords: circadian system, photic synchronization, melatonin, actigraphy, cognitive function, seniors