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SLEEP ANALYSIS MODEL BASED ON BEDROOM ENVIRONMENT AND DAYTIME ACTIVITY

Abstract:

Sleep and physical activity are among the most important lifestyle factors that can help prevent the leading chronic diseases in adulthood. Japanese adults are recommended to sleep for 7–9 hours per night and to accumulate 150 minutes of moderate-to-vigorous physical activity (MVPA) each week. However, sleep deprivation has become a serious social problem. In this study, in order to clarify the relationship between core temperature and bedroom environment / daily activities during sleep, we propose an estimation model of core temperature from the data of body surface temperature, bedroom temperature, bed temperature, bedroom humidity, bedroom carbon dioxide number, heart rate etc. using neural network model. Also, we use sleeping time data (waking time, shallow sleeping time, REM sleeping time, deep sleeping time) as output information, using bedroom environment data like bedroom temperature, humidity, carbon dioxide number etc. and physical activity information every day as input information, and evaluate daily sleep quality by data envelopment analysis (DEA model). By doing this, we clarify the tendency of sleep, try to make an improvement plan aiming for a sleeping life by preparing regular sleeping habits.

Keywords:

core temperature; heart rate; sleep deprivation; DEA;