Chapter 22
Sleep Management Promotes Healthy Lifestyle, Mental Health, QOL, and a Healthy Brain

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ABSTRACT
This chapter is an overview of sleep, lifestyle, mental, and physical health, and the characteristics of insomnia among the elderly and students. The purpose of this chapter is to provide an overview of the effects of the sleep management with actual examples of public health from the community and schools. Sleep management that included short naps and exercise in the evening was effective in promoting sleep and mental health with elderly people. The interventions demonstrated that the proper awakening maintenance and keeping proper arousal level during the evening were effective in improving sleep quality. Furthermore, sleep management that included sleep education and cognitive-behavioral interventions improved sleep-related habits and the quality of sleep. In this study, a sleep educational program using minimal cognitive-behavioral modification techniques was developed. Mental and physical health were also improved along with improving sleep with the elderly and students. These results suggest that cognitive-behavioral interventions to improve the sleep practices are effective for mental health, the activity of daily living (ADL), and the quality of life (QOL).

INTRODUCTION
Many recent surveys in Japan have reported that one in three Japanese elderly individuals and one in five Japanese adults and students suffer from insomnia. Insomnia is becoming a serious social problem; insomnia is listed as one of the refractory diseases of the 21st century. It has been observed that today’s adolescents and children have nocturnal lifestyles and sleep for few hours. The percentage of pupils who experience insufficient sleep is 59% for those in elementary school, 67% for those in junior high school students, 74% for
those in high school. These percentages increase throughout the school year, and they exceeded the 55.6% of adults who reported sleep insufficiency. The effects of a lack of sleep or sleep disorder on brain function include decreased memory and learning functions (Bonnet, 1994), and lower powers of attention and concentration (Drake, et al. 2001). To ensure proper sleep practices, correct knowledge about sleep is important. Moreover, proper sleeping habits are important. Recently, several non-pharmacological treatments have been shown to improve sleep.

The objectives of this chapter are to provide an overview of the effect of sleep management using sleep education and cognitive-behavioral interventions that aim to improve sleep-related habits, the quality of sleep, and health.

BACKGROUND

Sleep Mechanisms and the Characteristics of Insomnia: Changes in Sleep and Biological Rhythms with Age

Insomnia is the experience of inadequate or poor sleep quality that is characterized by one or more of the following: (1) difficulty falling asleep (sleep-onset insomnia), (2) difficulty maintaining sleep, (3) waking too early in the morning (early morning awaking), and (4) non-refreshing sleep (non-restorative sleep). Insomnia also involves daytime consequences, such as tiredness, lack of energy, difficulty concentrating, and irritability (Kiley et al., 1994). The causes of insomnia, other than the effects of age, are considered to include the lack of exercise and difficulty dealing with stress.

Figure 1 shows a model of the changes in sleep architecture and biological rhythms. Sleep in the elderly can be characterized as shallow, inefficient sleep. With age, there is a considerable decrease in deep sleep (slow wave sleep, Stages 3–4) and an increase in night awakenings, and thus conspicuous interruptions during sleep. The reduction in slow-wave sleep that accompanies age leads to a less efficient process of relieving stress or pressure built up during the day. The decrease in slow-wave sleep and increase in night awakenings may be considered signs of the deterioration of the maintenance and control system that manages sleep because of age. Furthermore, age differences in the REM latency (the duration of NREM sleep before the first REM period of the night), in which older subjects show shorter latencies than younger subjects, have been shown.