



Review Article

The Effect of Relaxation on Sleep Disturbance in Elderly Community Residents: An Intervention Using Breathing Techniques and Muscle Relaxation Combined With Sleep Education

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Abstract

To improve sleep disturbance in the elderly, we must pay attention to stress management in the background of the elderly-specific sleep disturbance, as well as the improvement of sleep habits. The present study suggested that breathing techniques and muscle relaxation combined with sleep education promote behavioral change in sleep habits and emotional stress management, improve sleep disturbance and sleep quality, and decrease the number of sleeping pills required. These changes may lead to the increase of subjective health and improvement of QOL, such as persistent motivation to accomplish things. Widespread use of these techniques to prevent sleep disturbance could contribute to sleep wellness in the entire elderly community.

Introduction

Comprehensive Survey of Living Conditions in Japan says that one in three elderly persons have some problems in sleeping [1]. Those sleep disturbance are considered to be associated with type 2 diabetes mellitus, metabolic syndrome, atherosclerosis and depression. Conversely, sleep disturbance can affect those diseases [2-3].

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The author conducted a population survey and the results showed that daily-life stresses affected sleep disturbance more seriously than lifestyle diseases, and sleep disturbance affected daily-life satisfaction and mental health [4]. Particularly in some cases of the elderly, sleep medication did not improve sleep disturbance, while they tended not to rely on medication. In June 2013, “Clinical Practice Guideline for the proper use and cessation of hypnotics” was published in Japan and the combined treatment of pharmacological therapy and behavioral therapy was recommended [5]. In March 2014, “twelve articles” were included in the revised “Sleep Guidelines for Health Promotion”, published by the Japanese Health Service Bureau which was based on the evidence of the previous studies [6].

In the elderly, the main risk factors for sleep disturbance are poor social support, living alone, regular hospital visits, needing caregiving, frequent drinking, insomnia, unemployment and financial problems [7]. Conversely, sleep quality increases subjective health and daily-life satisfaction [8].

Thus, it is essential to establish simple and practical techniques, which are based on social and psychological factors for sleep disturbance, as well as to improve sleep-related lifestyle.

Therefore, the author studied the previous reports and statistical methods, and examined simple and practical relaxation techniques, which were combined with sleep education for sleep disturbance in the elderly community residents.

The Study of the Previous Reports

Physiological changes of the sleep mechanism associated with aging

Aging leads to increased sleep latency, decreased sleep efficiency, increased number of arousals during sleep, increased shallow sleep, and decreased deep sleep [9].

Those changes are derived from the decreased function in the maintenance mechanism of sleep and biorhythms. [10]. In addition, the decreased regularity of exercise, social contact and diet can cause deteriorated biorhythms. A nap in the evening also deteriorates the proper maintenance mechanism of wakefulness. As individuals get older, the sleeping time gets shorter, and they have more awakening during sleep, premature morning awakening, and time in bed. Those backgrounds lead to poor sleep efficiency [11].

For the sleep problems with aging, sleep education and cognitive behavioral therapy would be effective which is based on the “twelve articles” in the “Sleep Guidelines for Health Promotion 2014 [6,12-14].

In June 2013, “Clinical Practice Guideline for the proper use and cessation of hypnotics” was published in Japan and the combined treatment has been recommended using pharmacological therapy and behavioral therapy [5]. Then, CBT-I (Cognitive Behavioral Therapy for Insomnia) has been performed in clinical practice [15-17].

The effect of psychological factors on sleep in the elderly

Kanesaka et al., showed that as the stress gets bigger, more people complain about insomnia daily-life stress affects sleep disturbance, deteriorates daily-life satisfaction [8,18].

Furutani et al., compared sleep habits in terms of stressors and found delayed bedtime, more nap during the day, and more anxiety in the group with stressors. They pointed out that sleep education should be combined with stress management as well as lifestyle [19].

Stresses and stress coping in the background among the elderly

Stress coping is a technique by which people live with stresses not fight with them. Richard Lazarus noticed that cognitive appraisal of stress changes the severity of stress and defined the stress coping theory based on self-directed management. Stress coping is classified into problem-focused coping and emotion-focused coping. Problem-focus coping aims at solving the stressor itself directly, clarifying or improving it. Emotion-focused coping aims at controlling emotional reactions, not the stressor itself. Emotion-focused coping tries to avoid problems themselves, or keep a distance temporarily and then suppresses over-emotionality which weakens concerns related to the stressor. Relaxation is one form of emotion-focused coping [20]. Lazarus suggested that positive interpretation relieves irritation from anxiety and apathy.

To generate and keep trust, relation and bond in the community is the key to relieving psychological stress and overcoming positively [21].

Osada et al., reported that stress and depression in the elderly are deteriorated by the change of social roles associated with aging, such as retirement, the change of family relations associated with aging, family death, the decrease of social resources, and caregiving as a today's challenge. Those stresses can be relieved by social support and family relationships [22,23].

Ishizu et al., reported that to improve subjective sleep, it is important to keep regular hours and social contact, and to adapt their behavior to avoid complaining to their family and friends. Then, they should join positive activities, such as consultation with family and friends about their problems, a 30-minute nap after lunch, and stress-coping by removing the stress-causing environment. On the other hand, supporters, family, friends, and public health nurses, should let the elderly keep regular hours, support them for the social contact, be tolerant and avoid complaining about their mistakes, and establish a support system for their diseases in order to improve their subjective sleep [24].

Thus, for coping with sleep disturbance in the elderly, it is necessary to avoid negative thinking in bed, and to interpret negative stressors positively. In addition, it is necessary to improve lifestyle, such as a 30-minute nap after lunch, exercise, farming, chat with friends, and a hobby, as well as joining a social network in the community.

In a new life after retirement, it is important to find meaning in the new life, and to cope with stress physically and mentally, such as forming new human relationships and joining in the community.

Coping with sleep disturbance by practicing relaxation techniques

Relaxation means comfort and healing, and Koitabashi said that it

has a positive meaning "taking back a loose condition [25]. Kumano et al., said that relaxation techniques, such as breathing techniques and muscle relaxation, are not just a stress-free state, or a loose state, but a stress-resistant state, which can be introduced by an individual's own will, by a cerebrum state. Relaxation techniques cause relaxation responses, such as loosening muscle, easing anxiety and tension, changing the brain function and changing the whole body through the biocontrol systems such as autonomic nerves, the endocrine system, and the immune system. It can suppress the excitement of sympathetic nerves, and activate parasympathetic nerves. In addition, relaxation can enhance the natural healing power which every individual naturally has [26,27].

The effectiveness of relaxation techniques on sleep disturbance is shown in the study of sleep improvement by progressive muscle relaxation in home patients by Imabeppu [28].

Practical use of relaxation techniques for sleep disturbance for community residents is CBT-I treatment, but the methods of education, practice, etc., are not clarified.

For sleep disturbance in the elderly, it is effective to improve lifestyle effectively for good sleep, to think positively and to avoid stressors completely, as a way of coping with the elderly-specific stress. This emotion-focused coping is essential for the improvement of sleep disturbance in the elderly.

By practicing relaxation techniques, deciding to make a relaxed state enables one to enhance resistance to stress, to improve sleep quality, and to lead to behavioral change in lifestyle related to sleep.

Practice of relaxation would allow the elderly to see their own changes as facts and think positively that the elderly period is a step to enhance their own inner and human value. To prepare physically and mentally is a key to living independently and healthily.

The effect of breathing techniques and muscle relaxation on sleep disturbance in elderly community residents [29]

In the present study, the author examined whether stress-coping by a combination of sleep education and breathing /muscle relaxation in the elderly community residents improved sleep quality, and led to behavioral change in lifestyle related to sleep.

Intervention

Sleep education

Sleep education was performed to acquire the correct knowledge and understanding of sleep, which included lifestyle modification, the sleep mechanism, the relation of sleep steps and age, body temperature and sleep, rhythms of sleep and awakening, Sleep Guidelines for Health Promotion, sleep habits-self-check note, etc., [6,30]. In addition, the participants were asked to keep a sleep journal and to note their own sleep status. They were asked to fill out the questionnaire "lifestyle check on sleep" (Figure 1) at the first session, week 2 and week 4, to confirm any behavioral change in lifestyle.

Breathing/muscle relaxation

"Guide to relaxation" was used to explain breathing/muscle relaxation, then a sample was shown and practical training was performed. One hour before bedtime was the recommended time for relaxation techniques at home. Turning down the room lights, sitting up straight,

or lying down on the floor was suggested. Performing, at a convenient time, a 17-minute simple program using a CD until participants had gotten used it, thereafter using it in their own way, at night when they wake up only the breathing exercise is sufficient, 1-2 times a day and two times or more a week etc. were recommended [31].

Figure 1: lifestyle check on sleep - stress-coping by yourself.

		average	SD	P (paired data t-test)	P (two-way analysis of variance)
practice G n=18	before	37.2	3.49	<0.05	n.s.
	after 1 m	39.0	3.20		
control G n=11	before	39.2	3.65	n.s.	
	after 1 m	39.4	4.93		

Table 2: Effects on lifestyle related to sleep (2017).

		average	SD	P (paired data t-test)	P (two-way analysis of variance)
practice G n=18	before	20.4	4.19	<0.01	n.s.
	after 1 m	24.4	5.14		
control G n=10	before	22.1	5.88	n.s.	
	after 1 m	22.9	6.17		

Table 3: Effects on coping with emotional stress (2017).

	Practice G n=32 (R2=0.4813)			control G n=25 (R2=0.1316)		
PSQI Sub-item	Partial regression coefficient	p		Partial regression coefficient	p	
Sleep quality	2.25	0.00	p<0.001	-0.08	0.88	n.s
Taking a sleeping pill to sleep	1.70	0.02	p<0.05	1.10	0.11	n.s
Snoozing during social activities	0.56	0.31	n.s	-0.19	0.77	n.s
Willingness to get things done	0.30	0.57	n.s	0.05	0.93	n.s

Table 4: Changes in PSQI sub-items one month after practice in the practice group.

Results and Discussion

1. Table 1 show that there was a significant improvement in PSQI one month later in the practice group compared with the control group. The combination of sleep education and breathing/muscle relaxation affected the improvement of sleep disturbance one month later.

		average	SD	P (paired data t-test)	P (two-way analysis of variance)
practice G n=32	before	10.3	3.03	<0.001	<0.05
	after 1 m	8.0	3.16		
control G n=25	before	10.0	3.31	n.s.	
	after 1 m	9.3	3.59		

Table 1: Effects on sleep disorders (PSQI).

• Tables 2-4 shows that practice of breathing/muscle relaxation led to lifestyle improvement on sleep disturbance, behavioral change for emotion-focused coping and a decreased number of sleeping pills being taken. In the control group, which only received sleep education, there was no significant improvement one month later.

• Six months later, PSQI was significantly improved compared with the prior state, slightly worse compared with one month later, but still improved. In terms of lifestyle on sleep, the behavioral change was not maintained, but in terms of emotion-focused coping, the behavioral change was maintained. These results show the need for sleep quality promoted the practice of breathing/muscle relaxation, and the maintenance of the behavioral change including emotion-focused coping.

Conclusion

It was denoted that the combination of sleep education and breathing/muscle relaxation would promote the behavioral change including emotion-focused coping as well as lifestyle on sleeping, which would improve the quality of sleep and lead to the decrease on the number of taking sleeping pills.

Moreover these sequences would be considerate to improve the subjective health and QOL such as keeping motivation to achieve a variety of activities.

The practice of this relaxation combined with sleep education would allow the elderly to admit their internal and external changes as a fact and further to think positively that the elderly period is a step to enhance their own inner and human value.

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