

# The Effects of Sleep Hygiene Program on Sleep Quality in the Elderly Women

Se-JinJu<sup>1</sup> and Ju-HyunWoo<sup>2\*</sup>

<sup>1</sup>Department of Nursing, Namseoul University, 91 Daehak-ro, Seonghwan-eup, Sebuk-gu, Cheonan-si, Chungcheongnam-do, 31020, S. Korea; lovepdd@nsu.ac.kr

<sup>2</sup>Department of Nursing, Ansan University, (Il-dong) 155, Ansandaehk-ro, Sangrok-gu, Ansan-si, Gyeonggi-do, 15328, Korea; woojuhyun@ansan.ac.kr

## Abstract

**Objectives:** This research was tried to investigate effects of implementation of sleep hygiene education to elderly women people living in some local communities on Pittsburgh sleep quality index, sleep hygiene knowledge and depression of elderly women. **Methods/Statistical Analysis:** This study used quasi-experimental study design. Eligible participants were female seniors aged 60 or older living in a local community. A total of 50 participants were assigned to an 8-session sleep hygiene program (n=25) or control group (n=25). The collected data materials were processed with SPSS 18.0 program. Descriptive statistical method  $\chi^2$  test, t-test, and Paired t-test were utilized. The outcome variables were sleep quality, depression, and sleep hygiene education. **Findings:** The findings showed that the program was effective in decreasing sleep disorder. This study experimental group and control group were tested for their homogeneity. As a result, the two groups showed no statistically significant difference in their family member cohabitation status and number of physical illnesses whereas their age and educational background showed significant difference. The homogeneity between experiment and control groups was tested before the experiment regarding the dependent variables of sleep quality and depression. And the sleep quality in experiment group was found at 12.8; and control group, 11.16, representing a significant gap ( $t=2.52$ ,  $p=.02$ ). The depression status of experiment group was found at 4.56; and control group, 4.88, showing no significant gap ( $t=-.27$ ,  $p=.79$ ). Through the result of impact of sleep hygiene program on sleep quality in the elderly women, Pittsburgh sleep disorder score in participation group was much lower than in non-participation group ( $t=2.34$ ,  $p<.05$ ). The depression status represented no significant difference. Level of sleep hygiene knowledge and satisfaction of the program of participation group was increased after program. **Improvements/Applications:** Sleep hygiene program is helpful to acquire life habit knowledge that is needed to improve quality of sleep and to improve quality of sleep.

**Keywords:** Elderly, Sleep Disorder, Sleep Hygiene

## 1. Introduction

Reports that the South Korean society is aging become a main social issue as part of the problems according to the elderly population characteristics. According to the March 2010 release by the Statistics Korea, every 100 young people, the number of elderly people exceeded 60 first in 2009. Of the total national population, the elderly population aged at least 65 was 519,300 accounting for 10.7% to renew the record<sup>1</sup>. An aging society where elderly population grows larger requires proper understanding of

elderly population characteristics as well as responses to health and welfare, its main causes of problem. Especially since mental health problem troubles physical health too, elderly mental health problem could be expanded into a social issue beyond individuals. Geriatric illnesses account for the main part of it including dementia shown in 8.3% of the cases; geriatric depression, 15%; and geriatric sleep disturbance, as high as 25% through 60%<sup>2</sup>. Less than satisfactory sleep quality causes an illness, physical and mental damage, and even insomnia<sup>3</sup>. Sleeping functions to help brain recover damage and recharge which

\*Author for correspondence

was busy doing metabolism during the days. In sleep disorder, such sleep is not achieved to a sufficient level so it may result in physical illness or mental or social problems. For this reason, good intervention needs to be made with extra care. Elderly people complain more about having less than quality sleeping as they experience changes in bio rhythm to make them sleep early in the evening and wake up early in the morning. The elderly tend to wake up more often during sleeping at night. And as their sleeping is discontinued several times, they sometimes sleep briefly several times, experiencing huge changes in sleep quantity and quality<sup>4</sup>. As such, sleep disorder in the elderly takes place due to the complicated functioning of many different factors such as normal aging process, lifestyle changes like retirement, and special physical and mental illness. For this reason, a more systematic approach is necessary for diagnosis and treatment thereof to consider diverse factors. Elderly women, in particular, go through menopausal to experience reduction in daily activity performance ability, discomfort, and weaker muscular-skeletal functions. Accordingly, their sleep quantity decreases and sleep quality degraded, complaining about sleep disorder more often than elderly male<sup>5</sup>. However, despite diverse causes and severe pains, people tend to be indifferent to sleep discomfort by regarding it simply as part of the aging process or feel repulsion against receiving psychotherapy; or intake sleeping pills inefficiently only to cause even more serious sleep disorder. Sleep disorder shows many physical symptoms due to changes in autonomic nervous system such as lethargy, fatigueless, sensitivity, frequent mistakes, lower enthusiasm, heart palpitation, stifling feeling, and fever to prolong the sense of depression<sup>6</sup>. Therefore, in order to overcome sleep disorder, not only the drug treatment but also cognitive behavioral programs such as sleep hygiene education and tension relaxation method can be presented. In this recognition, sleep hygiene education is to be provided in this study for healthy elderly sleep. The sleep hygiene education is already known to use for insomnia patients independently or in parallel with another treatment<sup>7</sup>. And as it encourages environmental improvement and lifestyle change as factors influencing sleep<sup>8</sup>, sleep hygiene education is easily approachable and an effective intervention method for local community seniors. In this sense, the present study seeks to provide sleep hygiene education and examine its effects on local community female seniors' sleep quality, sleep hygiene knowledge and depression.

## 2. Materials and Methods

The purpose of this study is to develop a sleep hygiene education program and identify the effects thereof in order to utilize as an intervention method. Specific purposes are as follows;

- Develop a sleep hygiene education program.
- Examine the effect of sleep hygiene education program on elderly sleep quality.
- Examine the effect of sleep hygiene education program on elderly depression.
- Examine the sleep hygiene knowledge level of seniors receiving the sleep hygiene education program.

### 2.1 Design

This study is the quasi-experimental research of non-equivalent control group pretest-posttest. The study subjects are female seniors aged 60 or older living in a local community. Their PSQI (Pittsburgh Sleep Quality index) scores are 10 or over. They could understand the study questions, communicate with others, and understand the purpose of this study. They accepted the study participation and showed their agreement in writing. A total of 50 subjects participated in this study experiment with 25 in the experiment group and 25 in the control group. All were provided with the written guidelines for sleep disorder. The collected data materials were processed with SPSS 18.0 program. Descriptive statistical method  $\chi^2$  test, t-test, and Paired t-test were utilized. In order to investigate the internal consistency of the measurement tools, Cronbach's alpha coefficient was produced.

### 2.2 Sleep Hygiene Program

A total of 8 rounds of sessions were provided with a view to improve the sleep disorder knowledge assessment level, identify proper responses and enhance sleep quality. Table 1 is about sleep hygiene program developed in this study. The 1<sup>st</sup> through 7<sup>th</sup> rounds were provided for 60 minutes and the final 8<sup>th</sup> round was 2-day session. In the 1<sup>st</sup> session, sleep disorder education was provided. One mental health expert lectured overall understanding of sleep disorder and how to respond. In the 2<sup>nd</sup> session, participants introduced each other and reinforced the bond among themselves. They solved quiz to better understand sleep disorder and own sleep patterns. In the 3<sup>rd</sup> session, sleep hygiene education was provided for them to

**Table 1.** Sleep hygien program

Session round	Theme	Description	Time (min.)
1	Sleep disorder education	Education by expert for general understanding of sleep disorder and its responses	60
2	Pleasing Different Refreshed morning	Introduction of each other. Reinforce relationships while making nicknames to one another. Solve quiz to understand sleep disorder. Find out my own sleep pattern.	60
3	sleep hygiene education	sleep hygiene education to find out own cause of sleep disorder and sleep pattern	60
4	Zero stress	Meditation and relaxation therapy Follow yoga and stretching program helpful for deep sleep to ease stress and relax mind and body.	60
5	Aroma therapy for good sleep	Experience foot bath and massage program using aromatic oils (lavender, rosemary) good for sleep.	60
6	Good food for deep sleep	Study the effects of food intake each hour on sleep. Education on food intake for sound sleep.	60
7	Pleasant finish	Share own sleep problems and their responses learned during the program. Program evaluation	60
8	Sleep camp	Provide appropriate sleep environment and sleep hygiene experience	2days

find out a cause of own sleep discomfort and check their sleep patterns once again. In the 4<sup>th</sup> session, meditation and relaxation therapy was educated along with yoga and stretching programs for deep sleep to teach how to ease their stress and ease their mind and body. In the 5<sup>th</sup> session, the participants experienced foot bath and a massage program using aromatic oils (lavender, rosemary) helpful for good sleep. In the 6<sup>th</sup> session, the effects of food intake each hour were studied and proper food intake for good sleep was taught. In the 7<sup>th</sup> session, the participants shared their own sleeping problems and responses found out during the program period and evaluated the program. In the 8<sup>th</sup> session, a sleep camp was performed to provide appropriate environment for good sleep and experience sleep hygiene.

### 2.3 Quality of Sleep (PSQI)

The measurement was done herein with Buysse<sup>9</sup> developed Pittsburgh Sleep Quality Index (PSQI) translated by<sup>10</sup>. This instrument is to measure the sleeping trend for the past one month and the degree of subjective sleep disorder. Each question was quantified from 0 point for 'not at all'; 1 point for 'less than once a week'; 2 points for '1~2

times a week'; and 3 points for 'at least 3 times a week'. After summing the scores of each item, an index is produced to make between 0~3. The full score is 21 points. If the 5-point mark is exceeded, such a case is deemed to suffer sleep disorder. And the higher the scores are, the lower the sleep quality is. The instrumental reliability was Cronbach alpha = .83.

### 2.4 Deprssion

In order to measure the level of depression in the study participants, the translated version of short geriatric depression scale developed by in<sup>11</sup> was employed herein. The questions asked participants' feelings for the past one week. There are 15 question items in 2-point scale (0=no; 1=yes). Five questions are inverse conversion. In this depression scale, results exceeding the 5-point mark are viewed as a depressive status and those exceeding 10, always depressive. The instrumental reliability is Cronbach alpha = .88.

### 2.5 Sleep Hygiene Knowledge

The instrument on sleep hygiene knowledge assessment was developed by the author of this present study. It has

12 question items in total, scoring 0 or 1 point each. The higher the results are, the higher the knowledge level. The Cronbach alpha = .71.

### 3. Study Process

#### 3.1 Preparation by Researcher

The researcher is a first-grade expert in mental health and provides advice to local community elderly mental health center. The researcher discussed the program together with one mental health care nurse, one daily sports instructor and one nutritionist and educated this study procedure and important notes in pre/post-test survey.

#### 3.2 Experiment Handling

The sleep hygiene program was provided a total of 8 rounds with a view to enhance the sleep disorder knowledge evaluation criteria, identify responses and improve sleep quality. The 1<sup>st</sup> through 7<sup>th</sup> sessions were done for 60 minutes and the final 8<sup>th</sup> round was performed as a one-night 2-day program. In the 1<sup>st</sup> session, sleep disorder education was provided. One mental health expert taught the general knowledge of sleep disorder and how to respond. In the 2<sup>nd</sup> session, the participants introduced each other to reinforce their relationship. While solving quiz they researched more about sleep discomfort and their own sleep patterns. In the 3<sup>rd</sup> session, sleep hygiene

education was offered and participants were instructed to find out own cause of sleeplessness and sleep pattern once again. In the 4<sup>th</sup> session, meditation and relaxation therapy was educated along with yoga and stretching program helpful for deep sleep to teach them how to relax body and mind and reduce stress. In the 5<sup>th</sup> session, the participants experienced foot bath and massage program using aromatic oil products (lavender and rosemary) for sound sleep. In the 6<sup>th</sup> session, the effects of food intake at each hour on sleep were studied and food intake helpful for good sleep was taught. In the 7<sup>th</sup> session, the participants shared their own identified sleep problems and responsive measured learned during the program and evaluated the program. The 8<sup>th</sup> round was a sleep camp for them to experience suitable sleep environment and sleep hygiene.

### 4. Results

#### 4.1 Characteristics, Homogeneity of Study Participants

This study experimental group and control group were tested for their homogeneity. As a result, the two groups showed no statistically significant difference in their family member cohabitation status and number of physical illnesses whereas their age and educational background showed significant difference as shown in Table 2.

**Table 2.** Characteristics, homogeneity of study participants

Characteristics	categories	Exp.	Cont.	$\chi^2$	p
		n(%)	n(%)		
Age(year)	≥74	13(52)	1(4)	14.51	.001
	75~80	9(36)	16(64)		
	81≤	3(12)	8(32)		
Education	No	4(16)	14(56)	12.72	.005
	Elementary school	9(36)	9(36)		
	≥Middle school	5(20)	1(4)		
Family unit	High school≤	7(30)	1(4)	2.51	.284
	Single	9(36)	8(32)		
	Coupleliving together	9(36)	5(20)		
physical illness	Familyliving	7(28)	12(48)	1.76	.624
	0	2(9)	3(12)		
	1-2	14(61)	13(52)		
	3-4	6(26)	9(36)		
	5≤	1(4)	0(0)		

\*<.05, \*\*<.001

## 4.2 The Homogeneity of the Two Groups at Pretest

The homogeneity between experiment and control groups was tested before the experiment regarding the dependent variables of sleep quality and depression. And the sleep quality in experiment group was found at 12.8; and control group, 11.16, representing a significant gap ( $t=2.52$ ,  $p=.02$ ). The depression status of experiment group was found at 4.56; and control group, 4.88, showing no significant gap ( $t=-.27$ ,  $p=.79$ ) as shown in Table 3.

## 4.3 Effectiveness of Sleep Hygiene Program

The experiment group receiving the sleep hygiene education program was found to show a significantly lower sleep quality result than the control group receiving no such program ( $t=2.34$ ,  $p<.05$ ). The depression status represented no significant difference as shown in Table 4. Also, after participating in the sleep hygiene education program as shown in Table 5, the participants' sleep hygiene knowledge results increased from before.

## 5. Discussion

Studies on elderly sleep have looked at caring hospitals and facilities for the most part instead of local communities. In

this situation, some of the physical, mental and functional areas were included all the time. In this present study, however, a sleep hygiene program was provided which can be performed by local community female senior on the daily basis to assess its effects on sleep quality, sleep hygiene knowledge and depression. As a result, the experiment group showed lower sleep quality score results than the control group, indicating elevated sleep quality. This finding is similar to the report by in<sup>12</sup> that they provided a sleep hygiene education to insomnia patients and found sleep improvement. The finding is also similar to the result found in<sup>13</sup> provided working women with a sleep hygiene program and found sleep quality improvement. Such a result can be viewed to support that sleep hygiene education is a key variable to predict sleep quality and that sleep hygiene practices are the basic method to improve sleep quality<sup>14</sup>. In<sup>15</sup> study, though not on the sleep hygiene education, provided an exercise program to local community female seniors and reported to found increased sleep satisfaction level. In addition, sleep program was conducted in the study where facility female seniors were provided with aromatic hand massage and positive effect on sleep was found<sup>16</sup>. And the study by in<sup>17</sup> implemented a sleep program, which found a positive effect of foot massage on sleep and depression ease. Also the study by in<sup>18</sup> Conta-Marx implemented a relaxation therapy for elderly cancer patients and found significant

**Table 3.** Homogeneity test for variables before the therapy

Variables	Exp.	Cont.	t	p
	n(%)	n(%)		
PSQI	12.39±2.70	11.16±1.28	1.79	.09
Depression	4.00±4.02	4.88±4.03	-.71	.48

\* $<.05$ , \*\* $<.001$

**Table 4.** Analysis of the effectiveness of Sleep hygiene program

Variables	Groups	Pre	Post	t or F	p
		M±SD	M±SD		
PSQI	Exp.(n=25)	12.80±2.99	11.44±3.53	2.34*	.006
	Cont.(n=25)	11.16±1.28	9.96±3.33		
Depression	Exp.(n=25)	4.56±4.29	4.36±4.28	0.37	.476
	Cont.(n=25)	4.88±4.03	4.68±3.53		

\* $<.05$ , \*\* $<.001$

**Table 5.** Analysis of the effectiveness of Sleep hygiene program

Variables	Groups	Pre	Post	t	p
		M±SD	M±SD		
Sleep hygiene Knowledge	Exp.(n=25)	6.52±2.52	9.72±3.39	7.34**	.000

\* $<.05$ , \*\* $<.001$



increase in their sleep quality. Given that a change in elderly sleep pattern could have a negative effect on their life, the sleep hygiene education was found effective as a nursing intervention to help improve female seniors' sleep quality. In this sense, the sleep hygiene education is expected to be an appropriate intervention method for female seniors living in local communities to provide together with or before drug treatment. Also the sleep hygiene knowledge score of the experiment group receiving the sleep hygiene education rose to a significant level, proving that the sleep hygiene education was effective in improved sleep quality. Various senses of social alienation and isolation in advanced ages are highly likely to result in elderly depression. In this present study, the depression score decreased after the sleep hygiene education but without statistical significance. Though any precise comparison is impossible due to the absence of a study applying a sleep hygiene education to female seniors in local community, the study by inreported that foot massage showed a positive effect on facility elderly sleep and depression ease. In addition, research on the effects of the aquarobics exercise, the exercise was reported to have a positive effect on depression in elderly women<sup>19</sup>, inconsistent with the present study finding. It is deemed because the living environment of study subjects is different and the program method was differently applied. Further identification of the program effect will need to be performed by providing repeated study on local community female seniors.

## 6. Conclusion

This study was performed in order to identify the level of sleep disorder ease and test the program effectiveness by teaching sleep hygiene knowledge and practices. Although the depression score results showed no difference after the sleep hygiene program implementation, the experiment group showed a lower PSQI score than the control group. Concerning the sleep hygiene knowledge level, the pre-test and post-test status of experimental group was compared and the post-test score rose far higher. Consequentially, the sleep hygiene program helps improve elderly sleep quality and can be utilized as an intervention program for local community female seniors with sleep disorder.

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