

# post

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**Submission date:** 10-Jan-2023 02:35PM (UTC+0700)

**Submission ID:** 1990628779

**File name:** turnitin\_post\_devin.docx (27.37K)

**Word count:** 1410

**Character count:** 7494

# SUNBATHING FOR IMPROVING THE SLEEP QUALITY OF THE ELDERLY

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## **Abstract**

Sleep changes is associated with the aging process. The elderly reported that they often had difficulty in falling and staying asleep. This study purposed to determine the effect of sunbathing on improving the elderly's sleep quality in Werda Nursing Home. A quasi-experimental was conducted with one group pre-post-test design. The population was 42 elderly in Werda Nursing Home. The sample was 38 respondents taken by quota sampling technique. The modified PSQI was used to collect data. Statistical analysis was using Mann Whitney showed a p-value of 0,000 smaller than  $\alpha$  0.05. In conclusion, sunbathing affected the elderly's sleep quality. The sunlight had a double impact in enhancing melatonin through the retinohypothalamic duct and SCN and stimulating the nocturnal melatonin phase by rearranging the pacemaker.

*Keywords:* sunbathing, elderly, sleep quality

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## **1. Introduction**

Rest and sleep are basic needs that must be met by everyone. Normal sleep involves two phases, namely rapid eye movement (REM) and sleep with slow eye movement or non-rapid eye movement (NREM). During NREM, a person experiences 4 stages during the sleep cycle. Stages 1 and 2 are characterized by deep sleep and individual will be difficult to be awakened (Perry & Potter, 2005).

Sleep changes related to the aging process such as increased sleep latency, reduced sleep efficiency, earlier awakening, reduced stages of deep sleep and circadian rhythm disturbances, and increased naps that affect the sleep's quality. The amount of time spent in deeper sleep decreased. The elderly report frequent naps and have difficulty falling asleep and staying asleep (Oliviera, A., 2012).

In 2021, the percentage of the elderly population in Indonesia was around 10.82% of the total population. This number is projected to increase to 21.4% of the total population in 2050, which are approximately 80 million people. Complaints of difficulty sleeping are often considered by society as a physiological process that usually occurs in old age (Bellakusuma & Yosef, 2016). The preliminary study conducted in Mojokerto were

involving 16 elderly. It showed that 90% of the 16 elderly have sleep disturbance such as the difficulty to sleep, waking up at night, and being sleepy during the day.

Mead (2008) argues that when people are exposed to sunlight or bright artificial light in the morning, melatonin production at night will occur more quickly, and will make sleeping easier at night.

Some elderly likes to take melatonin hormone-boosting supplements to get a good night's sleep. The use of supplements in a long term and large quantities are still questioned. Therefore, sunlight is still considered as the safest and most efficacious therapy. Thus, this study tries to gain the importance of sunlight in improving the sleep quality of the elderly.

## **2. Method**

In this study, the researcher used Quasy-Experimental type Non-Randomized One Group Pra-Post Test Design.

The population was all elderly people in the Mojokerto Nursing Home as many as 42 persons. There were 38 elderly who experienced poor sleep quality, as a sample. The research instrument used in data collection was the PSQI questionnaire. This questionnaire was to determine the sleep quality in the elderly.

The elderly will be given a pre-test related to sleep quality, and then they will be given treatment by sunbathing every 30 minutes, at 11.00-11.30 for two weeks. After two weeks of treatment, the elderly will be re-evaluated regarding their sleep quality.

Data were tabulated using the Mann-Whitney U test with a significance level of  $\alpha < 0.05$ .

## **3. Results and Discussion**

### General Data

Characteristics of Respondents Based on General Data at the Mojokerto Nursing Home.

*Table 1 Characteristics of Respondent Frequency Based on General Data at the Mojokerto Nursing Home in May 2021*

No	Variable	Treatment Group	
		F	%
1.	<b>Age</b>		
	a. 60-74 years	14	46,7
	b. 75-89 years	10	33,3
	c. >90 years	6	20,0
2.	<b>Gender</b>		
	a. Male	4	13,3
	b. Female	26	86,7
3.	<b>Education</b>		
	a. Uneducated	12	40,0
	b. Elementary school	15	50,0
	c. Junior high school	1	3,3
	d. College	2	6,7
4.	<b>Diseases</b>		
	a. Hypertension	10	33,3
	b. Asthma	1	3,3
	c. Stroke	3	10,0
	d. Rheumatism	9	30,0
	e. Etc	7	23,3

Source: primary data 2021

Table 2 *Characteristics of Respondents Based on Pre and Post-Test Sleep Quality in the Treatment Group at the Mojokerto Nursing Home.*

No.	Sleep Quality	Mean	Median	Std. Deviation
1.	Pre-test before treatment	7,06	7,00	1.480
2.	Post-test after treatment	4,04	4,00	0.793

Source: primary data 2021

Based on table 2, shows that the frequency of pre-test data before treatment obtained a mean of 7.06, in the post-test after being given treatment for 2 weeks, the mean obtained was 4.04. This proved that there was an increase in sleep quality between before and after treatment, while for the median before treatment, a value of 7.00 was obtained, and after two weeks of treatment, a median value of 4.00 was obtained. Therefore, the pre-test data frequency results before treatment obtained a standard

deviation value of 1,480, and after the respondent was given therapy for two weeks of therapy, a standard deviation value of 0,793 was obtained, this proved that there was an increase between before and after being given treatment.

According to this study, sunbathing can affect the sleep quality of the elderly at night. If we look at the environment around the elderly; their room certainly has ventilation but still covered with mosquito nets. So that the exposure of the elderly to light will be less.

Therefore, the elderly are treated with sunbathing because repeated exposure to sunlight during the day is effective in controlling the circadian phase and increasing the melatonin at night. This study results were strengthened by the study of Takasu, Nana N, and Satoko Hashimoto's (2016). The result explained that repeated exposure to bright light during the day increased the melatonin at night and maintained the circadian phase under a fixed sleep schedule. The effects of two different light intensities during the day were examined on human circadian rhythms. Sleep quality as indicated by polysomnography and subjective sleepiness was also measured. In the first week, under low light conditions (10 lx), the onset and peak of the nocturnal melatonin rise were significantly delayed, whereas the end of the melatonin rise was unchanged. Peak melatonin levels are not affected. As a result, the width of the nocturnal melatonin rise is significantly shortened. In the second week, under bright light conditions (5,000 lx), the phase of nocturnal melatonin rise did not change any further, but peak levels increased significantly. The core temperature of the body in the early sleep phase increases during the dim light exposure and reaches its maximum level on the first night of bright light conditions. Subjective sleepiness gradually decreases in the course of exposure to dim light and reaches a minimum level on the first day of bright light. These findings suggest that repeated exposure to bright daylight is effective in controlling the circadian phase and increasing nocturnal melatonin and suggests a close correlation between phases shifts-delaying the onset of nocturnal melatonin increases or body temperature rhythms and daytime sleepiness. The results of this study were also strengthened by the results of a study (Mishima et al, 2001). Older people exposed to much less ambient light and simultaneously suffered significantly reduced nocturnal melatonin secretion. Additional exposure to four hours (10.00 to 12.00 hours, 14.00 to 16.00 hours) of bright midday light in the elderly group significantly increased melatonin secretion to levels similar to those

in the young control group without circadian phase-shifting. There is a tendency for the magnitude of the increase in nocturnal melatonin secretion stimulated by a bright light to parallel improvement in sleep disturbance in these subjects. These findings suggest that we need to look at older people who suffer under poor environmental light conditions that result in irregular circadian rhythms, including sleep-wake cycles.

#### **4. Conclusions and suggestions**

Based on the study results, it can be informed that all respondent in the control and treatment groups has poor sleep quality. After the sunbathing treatment, the treatment group is showing an increase in their sleep quality than those in the control group. So it can be concluded that sunbathing affects the increasing of elderly's sleep quality. Therefore, sunbathing can be recommended as one of the non-pharmacological therapy to improve sleep quality in elderly. The study results can be an additional source of literature in the health sector, especially regarding non-pharmacological therapies for sunbathing to improve sleep quality or reduce sleep disturbance needs.

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