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The Effect of Benson Relaxation on Quality of Sleep of Cancer Patients

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Abstract

AIM: This research was carried out to investigate the effect of Benson relaxation techniques on the quality of sleep in cancer patients.

METHODS: This research was a quantitative research with quasi-experimental pre- and post-test design with control group. Research conducted in the room Class 3 Bougainvillea and Teratai RSUD Prof. Dr. Margono Soekarjo Purwokerto. The sample in this study was 20 respondents of the intervention group and 20 respondents of the control group. The intervention group received 6 times Benson relaxation intervention with frequency 3 times a day for 2 days and the control group was given standard care. The data were collected from January to February 2021. Quality of sleep was measured before and after the intervention using the Pittsburgh quality of sleep index (PSQI) questionnaire. The hypothesis test was performed using Mann–Whitney U-test aiming to measure the effect size using d Cohen.

RESULTS: The results obtained mean values for PSQI score with median (min-max) intervention group 3.50 (2.00–7.00) and control group 0.50 (−2.00–3.00) and the results obtained p = 0.001. Clinically and statistically, there was a significant effect of Benson relaxation on decreasing PSQI score. The effect size test results in 2.33, which means that Benson relaxation has a great effect on the decrease in PSQI score.

CONCLUSION: Benson relaxation clinically and statistically affects the decrease in PSQI score of cancer patients recommended in nursing interventions as one of the complementary therapies.

Background

Cancer in 2015 resulted in 8.8 million deaths [1]. There are 32.6 million cancer patients worldwide and the prevalence of cancer in Indonesia reaches 1.4% [2], [3].

Cancer can affect the physical, social, spiritual, and economic condition [4] but it can also affect cancer patients psychologically. One of the effects of these cancers, is that it can affect the quality of sleep of the cancer patients, thus it can further worsen and decrease the quality of life [5], [6], [7].

Cancer sufferers who suffer from sleep disorders resulting from the effects of cancer such as stress, surgery, or emotional disorders such as anxiety associated with the start of chemotherapy, length of time since the diagnosis, cancer recurrence, stage of cancer, type of treatment, fatigue, environment, age, education, marital status, and menstruation [8]. Decreasing quality of sleep in cancer patients is one of the psychological problems in cancer patients [9]. In general, sleep problems are associated with a significant decrease in the quality of life as well as affecting the development of cancer [10], [11].

Some methods of complementary clinical treatment can be useful interventions for treating pain, fatigue, and sleep disorders in cancer patients such as hypnosis, training, cognitive behavioral care, relaxation, pain music therapy, and fatigue [12]. Non-pharmacologically clinically effective treatment can improve quality of sleep and psychology disorder [13], stress management, lower anxiety levels, mood disorders, and body discomfort are a relaxation technique that can complement treatment [14], [15], [16].

Benson's relaxation techniques are included in the relaxation therapy identified by Benson by developing a method of relaxation meditation with confidence [17]. Benson relaxation can reduce the problems experienced by patients that result in reduced maintenance costs [18].

Benson relaxation techniques can be used in everyday life. Benson relaxation techniques are very simple, easy to learn [16], and implemented because we only need to focus on two things to create a relaxation response, namely, meditation and repetition of words, phrases, prayers, or movements. Benson relaxation techniques are more widely used to treat pain and stress, which distinguishes Benson relaxation on quality of sleep

decline with the previous studies. The purpose of the researcher was to determine the effect of Benson relaxation on quality of sleep and can be used Benson relaxation as a complementary therapy to decrease Pittsburgh quality of sleep index (PSQI) score in cancer patients.

Method

Population research

This research was a quantitative research with quasi-experimental pre- and post-test with the control group. Sampling was carried out using purposive sampling technique. Based on the previous research, the effect of Benson relaxation on quality of sleep and inserted into the formula of sample size by considering the effect of three then obtaining samples of 20 respondents for each group with the consideration of 10% drop out. However, at the data collection, the number of prospective respondents is available quite a lot of 64 respondents. The number of patients who meet the criteria for the respondents is as many as 40 patients.

The number of samples in this study was 20 respondents of the intervention group and 20 respondents of the control group. The intervention group was given Benson relaxation and the control group was given standard care. The data were collected at RSUD Dr. Margono Soekarjo Purwokerto, Central Java. The sample of this study was cancer patients with Stages II and III, aged 18–70 years, had sleep disturbance, had chemotherapy, radiation, or surgery, and was an inpatients. Exclusion criteria include patients in emergencies, uncooperative in the study, using sleeping pills or those with side effects causing sleep, chemotherapy, decreased consciousness, not being able to discuss Indonesia, experiencing pain with pain scale 9–10, and experiencing hearing loss.

Benson relaxation

Benson relaxation is a relaxation technique that combines the techniques of meditation with conviction. Benson relaxation is performed in accordance with research protocols that have been developed based on guidelines that have been written by Dr. Herbert Benson as the inventor of Benson's relaxation techniques which include positioning yourself in a reclining position, closing the eyes, relaxing all the muscles, which starts by moving the legs, calves, thighs, abdomen, and then turning the head slowly and shrugging several times to relax the muscles related, take a deep breath slowly and naturally by pronouncing in the heart a word or phrase focus when exhaling. Examples can exhale while thinking "Peace," slowly turning attention to the abdomen by noticing how the belly expands when sighing, repeating the spoken focus word of the sauce to see the abdomen deflating when exhaling [9].

Focus on the rhythm of the stomach flower, directed the attention on the feeling in each part of the body, repeat the process, always maintained a passive attitude by ignoring disturbing sounds or thoughts. Perform for 12–20 min after completion, sit still for a few minutes, first with eyes closed and then with eyes open. Do not stand for a few minutes. During the relaxation process, the therapy takes care of the relaxation procedure and guides the subject of the study. Quality of sleep was measured before and after the intervention using the PSQI questionnaire [19].

Statistical analysis

Based on the previous research, the effect of Benson relaxation on quality of sleep and inserted into the formula of sample size by considering the effect of three then got the number of sample by 20 respondents each group with 10% dropout consideration. However, in the data collection, the number of prospective respondents is available quite a lot of 64 respondents. The number of patients who meet the criteria for the respondents is as many as 40 patients.

Demographic data analyzed by univariate consist of categorical presented in table of frequency distribution (n) and percentage %. Stages of analysis that is normality test, homogeneity, hypothesis test, and big test effect. Normality test using Shapiro–Wilk (because the number of samples <50), the data to be tested normality were the distribution of data from one measurement to the next measurement, normality test results show abnormal data distribution.

The statistical test on outcome is to see the pre-test and post-test of the intervention group and to see the difference of pre-test and post-test of the control group using Wilcoxon test. To see differences in the intervention group and control group, the Mann–Whitney U-test was performed. Test a large effect using a large value effect (d Cohen). Interpretation of the great value of the effect (d Cohen) was if ≤0.2 means small effect, >0.2 has a moderate effect, and >0.8 has a large effect. Data were analyzed using SPSS.

Results

Demographic characteristics and distribution of quality of sleep of cancer patients

Based on Table 1, it can be seen that the intervention group consists of 63% female respondents and 7% male respondents. Meanwhile, in the control group, 70% is female respondents, while 30% is male respondents. The average age of respondents in the intervention group and control group is 40–60 years. It can also be seen

Table 1: Demographic characteristics of respondents research in room Bougainvillea and Lotus RSUD Prof. Dr. Margono Soekarjo Purwokerto year 2018 (n = 40)

Characteristics	Group				p value
	Intervention		Control		
	n	%	N	%	
Gender					
Woman	13	65.0	14	70.0	0.736[a]
Man	7	35.0	6	30.0	
Age					
<40 years	6	30.0	5	25.0	0.723[a]
> 40 years	14	70.0	15	75.0	
Education					
Basic (< 12 years)	20	100.0	18	90.0	0.147[a]
High (> 12 years)	0	0.00	2	10.0	
Work					
Does not work	14	70.0	13	65.0	0.929[a]
Civil servant/pension	2	10.0	2	10.0	
Entrepreneur	4	20.0	5	25.0	
Marital status					
Single	0	0.0	2	10.0	0.147[a]
Married	20	100.0	18	90.0	
Income					
<1,400,000	14	70.0	13	65.0	0.736[a]
>1,400,000	6	30.0	7	35.0	
Long pain					
<2 years	19	95.0	17	85.0	0.292[a]
> 2 years	1	5.0	3	15.0	
Comorbid					
There is no	13	65.0	13	65.0	0.378[a]
Anemia	5	25.0	6	30.0	
DM	0	0.0	1	5.0	
Asthma	2	10.0	0	0.0	
Treatment					
Chemotherapy	16	80.0	16	80.0	1.000[a]
Surgical	4	20.0	4	20.0	
Cancer types					
Ca. Cervix	7	35.0	6	30.0	0.764[a]
Ca. Colli	1	5.0	3	15.0	
Ca. Mammae	7	35.0	6	30.0	
Ca. Nasofaring	5	25.0	5	25.0	

Source: Primary data (2018). Information: [a]Analysis using Chi-square test, homogeneous P > 0.05.

the respondents of both groups who have undergone chemotherapy of 80% and comorbidities in dominance with anemia disease where in both groups by 60%.

Baseline quality of sleep of cancer patients of both groups

Based on Table 2, it shows that baseline conditions in the intervention group have median (min-max) 17.5 (15.5–21.0) and control group median (min-max) 18.0 (16.0–21.0). This indicates that baseline PSQI intervention and control group values are not significantly different. In addition, homogeneity test on baseline PSQI score for both groups obtained p = 0.811 or p > 0.05. This baseline PSQI scores for both groups have an equivalent score.

Table 2: Results of baseline test PSQI score of cancer patients in Lotus Room and Bougainvillea RSUD Prof. Margono Soekarjo Purwokerto year 2018 (n = 40)

Control	PSQI baseline	p value
	Median(Min–Max)	
Intervention	17.5 (15.0–21.0)	0.811[a]
Control	18.0 (16.0 –21.0)	

PSQI: Pittsburgh quality of sleep index. Source: Primary data (2018). Information: [A]analysis using Mann–Whitney homogeneous P > 0.05.

A description of the patient PSQI score reduction in both of groups

In Table 3, the results obtained in the intervention group experienced a significant decrease in PSQI score significantly by 75% of the total respondents in the intervention group. Moreover in the control group, the majority of respondents experienced a non-significant decrease of 90% of the total control group respondents and obtained p <0.05 which showed significant decrease in PSQI score.

Table 3: An overview of the reduction of PSQI score of the intervention and control groups in Bougainvillea Room and Lotus of RSUD Prof. Dr. Margono Soekarjo Purwokerto year 2018 (n = 40)

Quality of sleep decrease	Intervention (n = 20)		Control (n = 20)		p value
	F	%	F	%	
Down meaningful[b]	15	75.0	2	10.0	0.001[a]
Not down meaningful[c]	5	25.0	18	90.0	

Source: Primary data 2018. Information: Analysis using Chi-square, Bturun meaning cutoff point ≥ 3, ctidak significant decrease cutoff point < 3, significant < 0.05. PSQI: Pittsburgh quality of sleep index.

The effect of Benson relaxation on quality of sleep

Before conducting hypothetical test, it was tested the relationship between external variable to quality of sleep improvement. This is done to determine whether there are other variables that affect the improvement of quality of sleep, which is shown in Table 4.

Table 4: External relations relation test on PSQI score decrease in the intervention and control groups at RSUD Prof. Dr. Margono Soekarjo Purwokerto year 2018 (n = 40)

Characteristics	Decrease in QOS		p value	OR	CI 95%
	Mean	Not mean			
	n (%)	n (%)			
Gender				-	-
Woman	11 (40.7)	16 (59.3)	0.746[a]		
Man	6 (46.2)	7 (53.8)			
Age					
≤40 years	7 (63.6)	4 (36.4)	0.096[b]	11.56	0.89–149.57
> 40 years	10 (34.5)	19 (65.5)			
Education				-	-
Basic (≤ 12 years)	16 (42.1)	22 (57.9)	0.826[a]		
High (> 12 years)	1 (50.0)	1 (50.0)			
Work			0.826[a]	-	-
Do not work	12 (44.4)	15 (55.6)			
Civil servant/pension	2 (50.0)	2 (50.0)			
Entrepreneur	3 (33.3)	6 (66.7)			
Marital status				-	-
Single	1 (50.0)	1 (50.0)	0.826 [a]		
Married	16 (42.1)	22 (57.9)			
Income				-	-
≤1,400,000	12 (44.4)	15 (55.6)	0.720 [a]		
>1,400,000	5 (38.5)	8 (61.5)			
Long pain				-	-
<2 years	16 (44.4)	20 (55.6)	0.455 [a]		
> 2 years	1 (25.0)	3 (75.0)			
Comorbid				-	-
There is no	12 (46.2)	14 (53.8)	0.778[a]		
Anemia	4 (36.4)	7 (63.6)			
DM	0 (0.0)	1 (100.0)			
Asthma	1 (50.0)	1 (50.0)			
Treatment					
Chemotherapy	15 (50.0)	17 (53.1)	0.236[b]	10.99	0.63–191.82
Chemotherapy and surgical	2 (37.5)	6 (75.0)			
Cancer types				-	-
Ca. Cervix	6 (46.2)	7 (53.8)	0.828[a]		
Ca. Colli	1 (25.0)	3 (75.0)			
Ca. Mammae	5 (38.5)	8 (61.5)			
Ca. Nasofaring	5 (50.0)	5 (50.0)			

Pittsburgh quality of sleep index source: Primary data (2018). Information: [A]analysis using Chi-square test, [b](<0.25) multivariate test was performed using linear logistic test, age P = 0.061, treatment P = 0.100 (p < 0.05).

In Table 4, output variable test results show that the variables of sex, occupation, income, comorbid disease, type of cancer, education, and marital status are not related to quality of sleep improvement. However,

the age and treatment variables were eligible to be involving in multivariate tests because they obtained p < 0.25. This aims to determine whether the characteristic variable has the strength of the relationship or not to decrease the value of the quality of sleep. Multivariate analysis showed that age and treatment variables had significance value > 0.05. This suggests that the two outer variables have no relation to sleep deprivation.

The effect of Benson relaxation on quality of sleep

Hypothesis test was performed using Mann–Whitney U-test to test the difference of PSQI score of both groups and then performed a large effect test. This is done to determine whether there was a Benson relaxation effect on quality of sleep decline in cancer patients. The results are shown in Table 5.

Table 5: Differences difference test and the effect of PSQI score of respondents both groups of the intervention and control groups in RSUD Prof. Dr. Margono Soekarjo Purwokerto year 2018 (n = 40)

Quality of sleep	Value of difference and big effect PSQI score both of groups			
	Median (Min-Max)	z	p value	d Cohen
Intervention (n = 20)	3.50 (2.00–7.00)	[d]−4.87	0.001[a]	2.33[c]
Control (n = 20)	0.50 ([b]–2.00–3.00)			

PSQI: Pittsburgh quality of sleep index. Source: Primary data (2018). Information: [a]Significant (p < 0.05) different test analyzes using Mann–Whitney, [c]effect size (d Cohen), [b]–, en size (d t test analyzes [d]significant z>196

Table 5 shows different test of PSQI score difference in the intervention group that obtaining median value 3.50 which means that there was a decrease of PSQI score and in the control group showed 0.50 and value of coherence effect got value equal to 2.33. This suggests that there was a clinical effect of Benson relaxation in reducing quality of sleep scores. The result of difference test of difference got the value of z = −4.87 (z arithmetic > 1.96) and p = 0.001 (p < 0.05) which means that there is statistically significant influence of Benson relaxation on quality of sleep scores cancer patient.

The result measurement effect size obtained value of 2.33. This suggests that Benson relaxation interventions have a large effect size on decreasing PSQI scores (d Cohen > 0.8).

In addition to testing differences in differences and large effects, researchers also conducted a comparison of quality of sleep pre-test and post-test intervention groups and control groups. The comparison was performed to determine the difference in PSQI score between the two groups. The results of the comparison are shown in Table 6.

Table 6 shows the median value in the intervention group pre-test of 17.5 and the post-test of 14.0 where the median cutoff point value of pre-test and post-test quality of scores in the intervention group was 3.5 obtained from the reduction of the median pre-test and post-test of the intervention group (≥ 3), so clinically, there was a significant decrease in PSQI score between pre-test and post-test measurements in the intervention group. The results obtained p = 0.001. This showed a statistically significant decrease in PSQI score in the intervention group (p < 0.05). The median value of pre-test PSQI score in the control group was 18.00 and the post-test was 17.00, which means the cut-point value of pre-test and post-test PSQI score in the control group is 1.00 (< 3). So clinically, there was no significant decrease in PSQI score between pre-test and post-test and end in the control group. The results obtained p = 0.067. This showed no significant decrease in PSQI score in the control group (p < 0.05).

Table 6: Differential test differences of pre-test PSQI score and post-test quality of sleep of cancer patients in both groups intervention and control group in RSUD Prof. Dr. Margono Soekarjo Purwokerto year 2018 (n=40)

Group	Pre-test	Post-test	p value
	Median (Min-Max)	Median (Min-Max)	
Intervention (n = 20)	17.5 (15.0–21.0)	14.0 (13.0–19.0)	0.001[a]
Control (n = 20)	18.0 (16.0–21.0)	17.0 (14.0–21.0)	0.067[b]

Source: Primary data (2018). Information: [a] Significant (p < 0.05), [b]not significant (p > 0.05), analysis using Wilcoxon.

Discussion

The results showed that Benson relaxation had an effect on PSQI score both statistically and clinically. The positive impact of Benson relaxation on PSQI score in cancer patients can be seen clearly by comparing measurements before and after treatment in the intervention group. Demographic data on the control group respondents and interventions have similar characteristics so as to strengthen the results of this study.

Based on the result of the research, Table 8 is presented to describe the decrease of the PSQI score both of groups. Showed that the intervention group experienced a significant decrease in PSQI score by 75% compared to the control group by 10%. From the results of observation and hear the statement of respondents disorders can be caused due to unfavorable environmental conditions, patients experience anxiety and irritability caused by the disease process they suffered. However, after explanation before relaxation and after intervention, respondents appear calmer and more open to their feelings and can relax maximally so that their quality of sleep improves.

Within the NCI statement that cancer patients undergoing hospital treatment, they often experience sleep disorder resulting from noise emerging from either the patient's family or from the environmental conditions where cancer patients are treated [20]. Benson's relaxation technique is a relaxation technique that improves quality of sleep, health condition, reduces stress level, and is able to provide relaxed and comfortable feelings [21], [22] so as to prevent

drowsiness [23]. Potter and Perry states that a person will fall asleep only when it has been comfortable and relaxed [24].

Based on the result of different test, it showed that there is significant Benson relaxation effect on the decrease of PSQI score with p = 0.001 (p < 0.05). The decrease in PSQI score in cancer patients is also clinically significant, based on the quality of sleep calculation of the intervention group which obtained a value of 3.5 and in the control group, which obtained 1.00. This suggests that the median cutoff point value of the intervention group's PSQI score is greater than ≥3 while the control group's sleep cutoff point <3 is said to be clinically significant if there is a decrease of ≥ 3 points [25]. Relaxation of Benson has a great effect on the decrease of PSQI score where effect value size 2.33 (d Cohen> 0.8). This is reinforced by the results obtained in multivariate analysis where external variables do not affect the quality of sleep.

A similar study by Rambod *et al*. shows that Benson relaxation significantly affects quality of sleep improvement [26]. After Benson relaxation on quality of sleep it was found significant difference of p < 0.05. Another finding by Wright states that quality of sleep can increase significantly in the Benson relaxation training group compared to groups with different interventions [27].

The effect of Benson relaxation on sleep fulfillment suggests a significant effect of Benson therapy on increasing sleep requirements where Benson relaxation is given at a frequency of 7 times a week for 1 week and within 10-20 minutes of each meeting [30], [31].

Conclusions

Based on the results of research and discussion, the influence of Benson relaxation on PSQI score of cancer patients in RSUD Dr. Margono Soekarjo can be concluded that Benson relaxation was proven clinically and statistically useful and effective against decreasing PSQI score.

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