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Effects of Benson's Relaxation Technique on Nausea in Patients with Chronic Kidney Disease Undergoing Hemodialysis

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Abstract

Background: Nausea is a common complaint of patients with chronic kidney disease due to an accumulation of urea. Hemodialysis therapy has some side effects that play a role in increasing nausea. The use of pharmacological treatment to deal with nausea may bring a risk of aggravating the work of the kidneys, and thus its administration should be limited. Benson relaxation is a complementary therapy which reduces nausea by increasing the relaxation response that affects the nausea center in the brain. **Objectives:** This study aims to determine the effects of Benson relaxation technique on decreasing nausea. **Methods:** This study used a pre-posttest quasi-experimental research design with a control group. The samples were 30 patients recruited using consecutive sampling and were divided into the intervention group (n=15) and the control group (n=15). Nausea was measured using a numeric rating scale. The results showed that there was a decrease in the mean of nausea in the intervention group from 7.13 to 2.26, with p-value = 0.001. The mean value slightly decreased in the control group from 7.20 to 6.40, with p-value = 0.001. **Conclusions:** Benson relaxation affected the decrease of nausea in patients undergoing hemodialysis. Based on the results of this study, it is expected that nurses apply Benson relaxation technique as a non-pharmacological therapy to decrease nausea in hemodialysis patients.

Keywords: Benson Relaxation, Chronic Kidney Disease, Hemodialysis, Nausea

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1. Introduction

Chronic kidney disease (CKD) is irreversible and progressive damage or decrease in glomerular filtration rate. Hemodialysis is a replacement therapy for kidney function to excrete metabolic remnants through semi-permeable membranes [1]. Hemodialysis is a conservative therapy which can cause physical, psychological, and social complications in some patients [2].

Nausea and vomiting are symptoms that mostly occur in CKD patients [3]. Around 70.7% of CKD patients undergoing hemodialysis complained of gastrointestinal symptoms; 65% of which occurred in the upper gastrointestinal tract, including nausea, vomiting, and dyspepsia [4]. Nausea occurs in 10% of CKD patients undergoing hemodialysis [5]. A previous study also reported that 31 (25.8%) out of 120 patients undergoing hemodialysis experienced nausea [6]. Similarly, Prabhakar et al. (2015) also reported that nausea occurred in 96.4% out of 1125 cases of CKD patients [7].

Nausea in CKD patients happens as a result of various changes in the cerebral and gastrointestinal organs. Increased urea in the brain will cause metabolic changes in the brain itself [8]. Accumulation of urea will stimulate the chemoreceptor trigger zone (CTZ), which then channels it to the center of nausea in the medulla, stimulating the vomiting center in the brain stem [9]. Nausea in CKD patients is a complication of gastrointestinal system disorders as a result of uremia [10]. Increased urea in the digestive tract will cause inflammation in the intestinal mucosa, resulting in nausea [8].

Nausea, when it is not immediately treated, can cause vomiting, which results in the irritation of the stomach. Chronic nausea and vomiting can cause hematemesis and melena, causing anemia; if such condition persists in an extended period, the patients will experience a decreased quality of life and even death [11]. Nausea and vomiting in patients undergoing hemodialysis will result in complications such as disorders of fluid and electrolyte balance that interfered with patient safety and increase of health cost [2]

As a part of nursing diagnoses, nausea remains substantial for patients. Nurses can play their roles in the interventions by administering a non-pharmacological therapy as part of nausea management. Previous research reported the utilization of non-pharmacological interventions to reduce nausea, such as acupressure or suppression of six pericardium points, warm ginger drinks, and yoga [12]. In this study, however, warm ginger drinks are not possible as patients with CKD get a fluid-limiting diet, while yoga is also not possible to do in the hemodialysis unit.

One form of non-pharmacological therapy of nausea, which can be applied to patients with CKD is relaxation [13]. Benson's relaxation will enhance the relaxation response so that it helps the body restore normal gastrointestinal physiological [14]. Benson's relaxation can reduce tension in the brain to decrease the stimulus of nausea. Benson's relaxation is one of the relaxation techniques in which patients are directed to relax by reciting words or sentences that increase the patients' confidence [1]. These words or sentences can be spiritual words or the ones that fit the patients' beliefs. Nurses are expected not only to focus on eliminating nausea to deal with the patients' physical

ailments, but also to meet the psychological and spiritual needs of patients [15].. This study aimed to determine the effects of Benson's relaxation technique on reducing nausea among patients with CKD undergoing hemodialysis.

2. Methods

2.1. Study design

This study employed a pre-posttest quasi-experimental research design with a control group.

2.2. Sample

The samples were 30 patients recruited using a consecutive sampling technique and were assigned to the intervention group (n=15) and the control group (n=15). The inclusion criteria were patients aged >18 years old, had compos mentis awareness, and experienced nausea. The exclusion criteria were patients who were unable to follow the course of the study.

2.3. Instrument

Numeric rating scale (NRS) was the instrument used to measure nausea. The NRS is a valid instrument for measuring nausea, which can be categorized as mild, moderate, and severe [16]. The scale ranges from 0 to 10 (0 means no nausea; 1-3 means mild nausea (patients feel symptoms of nausea, but these symptoms quickly disappear); 4-7 means moderate nausea (the symptoms of nausea come and go; and 8-10 means heavy nausea (patients feel nauseous to vomiting)). The reliability of NRS is high with a Cronbach's alpha of 0.98 (R = 0.98) [17].

2.4. Procedure

The study was conducted in the hemodialysis unit in a hospital in Semarang, Indonesia, after receiving ethical approval from the hospital. Participants were informed of the purpose of the study and consented for their voluntary participation. The study was begun by measuring the scale of nausea of the patients in the control group and the intervention group. Benson's relaxation was administered to patients in the intervention

group for 15 minutes. After the intervention, the scale of nausea was also measured in the intervention group. Meanwhile, the control group did not receive any intervention. The scale of nausea in the control group was measured 15 minutes after the first measurement. The intervention of Benson's relaxation was carried out by requesting the patients to be at their most comfortable position. They were asked to take a deep breath through the nose and breathe out slowly through the mouth while saying spiritual sentences according to their beliefs. The spiritual sentences used in this study had been consulted with a qualified religious expert.

2.5. Data analysis

The analysis of demographic characteristics was carried out by using a cross-tabulation analysis. The normality test was performed using the Shapiro Wilk test. The independent t-test was done to analyze the homogeneity of nausea levels in both groups. The dependent test t-test was performed to analyze the difference in the level of nausea at pre and post-tests in the two groups.

3. Results

Table 1 shows that a majority of respondents (n=11, 36.7%) were at the age of 56 to 65 years old (late elderly), males (n=16; 53.3%), Islam (n=26; 86.7%), and undergoing hemodialysis for more than 3 months (n=18; 60%). Most respondents reported that they would spit out the vomitus when they felt nausea (n=16; 53.3%).

Table 2 shows that the mean value of nausea in the control group and the intervention group was 7.20 and 7.13, respectively. The control group had a higher mean value than the intervention group. A further analysis obtained a p-value of 0.925 ($p>\alpha$), indicating that, before the intervention, there was no difference in the mean value of nausea between the control and intervention groups.

Table 3 shows that the mean value of nausea in the control group and the intervention group was 6.40 and 2.26, respectively. The control group had a higher mean value than the intervention group. A further analysis obtained a p-value of 0.001 ($p<\alpha$ (0.05), indicating that there were differences in the mean value of nausea between the control and intervention groups after the implementation of Benson's relaxation.

Table 4 compares the difference in the mean value of nausea before and after the treatment in the control group and the intervention group. The result showed that the p-value in the control group was 0.001, and in the intervention group was 0.001. The

Table 1: Demographic Characteristics of Respondents.

Variables	Groups			
	Intervention		Control	
	n	%	n	%
Age				
Early adult (26-35)	4	26.7	0	0
Late adults (36-45)	2	13.3	2	13.3
Early elderly (46-55)	4	26.7	2	13.3
Late elderly (56-65)	4	26.7	7	46.7
Seniors (>65)	1	6.7	4	26.7
Sex				
Male	9	60.0	7	46.7
Female	6	40.0	8	53.3
Religion				
Islam	12	80.0	14	93.3
Christian	2	13.3	1	6.7
Catholic	1	6.7	0	0
Period of HD treatment				
<3 months	3	20.0	9	60.0
≥3 months	12	80.0	6	40.0
Habits				
Spit out	6	40.0	10	66.7
Taking drug	3	20.0	3	20.0
Left out	5	33.3	2	13.3
Eating candy	1	6.7	0	0

Table 2: Level of Nausea before the Intervention.

Group	Nausea scale	f	%	Mean	SD	Std Error	p
Intervention	4-6 7-10	5 10	33.3 67.7	7.13	2.19	0.568	0.925
Control	4-6 7-10	9 6	60 40	7.2	1.61	0.416	

Table 3: Level of Nausea after the Intervention.

Group	Nausea scale	f	%	Mean	SD	Std Error	p
Intervention	0 1-3 4-6 7-10	3 10 2 0	20 66.7 13.3 0	2.26	1.48	0.38	0.001 0.001
Control	0 1-3 4-6 7-10	0 0 9 6	0 0 60 40	6.40	1.24	0.32	

Table 4: Mean Differences of Nausea before and after the Intervention.

Groups	Mean difference	SD	Mean of Std error	95 % CI (min-max)	*p*
Intervention	4.867	2.503	0.646	3.480-1.229	0.001
Control	0.800	0.775	0.200	0.371-1.229	0.001

mean difference in the intervention group was higher than that in the control group, i.e., 4.867 and 0.800, respectively. There was a higher decrease in the level of nausea among patients in the intervention group than the control group.

4. Discussion

The results of the analysis showed that the mean value of nausea in the intervention and control groups was not significantly different; both were at high levels of nausea. Nausea in patients with chronic kidney disease occurs due to various reasons such as uremia, electrolyte imbalance, excess of fluid, and anxiety [4]. Increased urea will result in biochemical alterations in cerebral blood which will activate the interaction between chemoreceptor trigger zone (CTZ), vomitus center (VC), and neurotransmitters [18]. An increased level of urea in the brain is toxic to the brain itself and can cause abnormalities in central metabolic in the medulla, which plays an important in the control of emesis, i.e., vomitus center and chemoreceptor trigger zone [8]. Patients with CKD also have increased levels of sodium, potassium, and potassium in saliva, causing nausea [19]. Increased levels of calcium will improve the release of gastrin, which stimulates stomach acid and increases nausea [20]. Uremia, which attacks the entire digestive tracts will cause normal flora to break down the urea to form ammonia, which causes inflammation of gastric mucosa [21]. Excess fluid in CKD patients is associated with the occurrence of mucosal edema in the gastrointestinal system [4]. Alterations that occur in the body due to clinical manifestations of CKD, as well as access to blood circulation during hemodialysis, will increase anxiety [22]. Increased anxiety will stimulate midbrain and CTZ as a central pathway of vomitus center [23].

Hemodialysis causes various effects of disequilibrium, which increases nausea and vomiting. A sudden decrease in blood pressure and uremia during hemodialysis can cause some sides effects such as nausea and vomiting [23]. The filtration rate and dialysate materials, fever, and anxiety are also the causes of nausea and vomiting in hemodialysis patients [2].

The patients in the intervention group showed the highest decrease of nausea after the intervention in the second measurement. Relaxation is a condition of diversion of

mind awareness which is performed by pronouncing words based on the religion and faith to help divert the attention of the patient from nausea to the faith in God as a driver to heal from the disease [24].

The results of this study also showed a decrease in nausea in the control group. The related factors causing decreased nausea among patients in the control group are associated with the patients' habits in eating, medication, and position. A habit of throwing out stomach contents when patients feel nausea can make the patients feel more comfortable, as all stomach contents are ejected. A full stomach before hemodialysis increases the risk of nausea and vomiting [2]. During hemodialysis, most patients have the positions of semi-fowlers and fowlers. Patients in the supine position during hemodialysis are more at risk of nausea and vomiting than the half-sitting positions [2]. Some patients also consumed emetic drugs to help reduce nausea. The use of anti-emetics when experiencing nausea helps reduce nausea [17].

This study showed that Benson's relaxation affects the decrease of nausea in patients undergoing hemodialysis, and therefore, it can be used by nurses as a non-pharmacological therapy to decrease nausea. Relaxation affects both physiological and psychological conditions of patients. Benson's relaxation is a complementary therapy which can promote a relaxation response in patients so that patients feel comfortable and decrease nausea [14]. The increased relaxation response can restore normal physiological statuses such as decreased brain stimulation and gastrin. Increased relaxation is also able to restore normal physiological statuses such as decreased brain stimulation and gastrin [14].

Benson's relaxation is a relaxation technique which directs the patients to focus their attention by reciting the spiritual verse to eliminate various disturbing thoughts to give a good impact [25]. Benson's relaxation is able to create calm and relaxed conditions that slow down the brain waves. Furthermore, it also decreases the stimulation of the nausea center and balance stimuli originating from urea so that nausea and even vomiting do not occur [26]. The pronunciation of spiritual verses during Benson's relaxation can bring a more positive state of mind by increasing the endorphin hormone, which affects the mood. The sample of spiritual verses that can be used to reduce nausea is *dzikr*. The practice of *dhikr* can distract patients from nausea and break the cycle of nausea, anxiety, and fear to the pleasant sensations [27].

Benson's relaxation helps patients relax and improve various aspects of physical health. Relaxation can reduce stress and anxiety to prevent further nausea and vomiting [28]. The sympathetic nervous system works when the patients have nausea, feel tensed and anxiety, while the parasympathetic nervous system works when the patients feel

relaxed; therefore, relaxation can suppress nausea, tension, anxiety, insomnia and pain [26]. When a patient is relaxed, the frequency of brain waves will start to slow down and be more organized. Benson's relaxation is able to help patients create a calm and relaxed state; it is usually performed in a lying down position and by following the relaxation instructions to relax the muscles from the head to legs [29]. The pronunciation of spiritual verses in this relaxation can reassure the soul and reduce and even eliminate stress, anxiety, and other restlessness [24]. Decreasing nausea in hemodialysis patients will help improve adequate nutritional intake to maintain the condition of the patients. Interestingly, adequate nutritional supply will reduce the risk of death rates for patients with CKD [30].

5. Conclusion

Benson's relaxation technique gave an effect on decreasing the level of nausea in the control group and the intervention group. The intervention group experienced a higher decrease of nausea that provided good clinical impact on patients. Statistically, there was also a decrease in nausea in the control group, but it was not clinically significant. Benson's relaxation could be developed as a non-pharmacological therapy for decreasing nausea in patients undergoing hemodialysis.

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