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The Effect of Supportive Psychotherapy Ventilation Techniques on Blood Pressure and Pulse rate in Depressed and Anxious Patients

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ABSTRACT

Background: *Rates of depression and anxiety disorders are increasing worldwide. Anxiety and depression are one of the comorbidities of cardiovascular disease, cardiovascular conditions are worse with no comorbid depression and anxiety. Depression and anxiety are independent risk factors for hypertension. Previous studies involving groups of patients who received psychotherapy were found to have decreased blood pressure.* ***Objective:*** *To determine the effect of Ventilation Technique Supportive Psychotherapy on Blood Pressure (BP) and Pulse Rate in Depressed and Anxious Patients.* ***Methods:*** *Experimental research with a pre-test, post-test design was conducted at dr.Wahidin Sudirohusdo Makassar General Hospital and its network in May - July 2020. The samples of this study were patients with depressive disorders and anxiety disorders who underwent routine treatment as many as 12 samples and 12 controls. The research subjects were measured with the Hamilton Anxiety Rating Scale (HARS) and Hamilton Depression Rating Scale (HDRS) and then checked blood pressure and pulse rate before and after the subject was given psychotherapy for 30 minutes. Data were analyzed using Pearson test.* ***Results:*** *The total sample was 12 treatment and 12 control people with an average age of 45.8. Statistically significant changes in systole blood pressure, diastole blood pressure and pulse rate were obtained before and after the provision of supportive psychotherapy ventilation techniques with a significant p value ($p < 0.001$). Based on the Pearson correlation test, the comparison of systole blood pressure, diastole blood pressure and pulse rate of the two groups was significant and the correlation was very strong (0.938) in systole blood pressure and (0.908) in diastole blood pressure and a strong correlation (0.729) in pulse rate.* ***Conclusion:*** *There was a significant reduction in systole blood pressure, diastole and pulse rate in the treatment group after receiving Ventilation Technique Supportive Psychotherapy when compared to the control.*

Keywords: *blood pressure; pulse; Anxiety; depression; supportive psychotherapy; ventilation*

INTRODUCTION

Rates of depression and anxiety disorders are increasing worldwide. WHO estimates that depression will be the second leading cause of morbidity worldwide by 2020.(WHO, 2017a) When anxiety and depression are comorbid with cardiovascular disease, cardiovascular conditions are worse compared to those without comorbid depression and anxiety. Hypertension is a common chronic disease and an important modifiable risk factor for cardiovascular disease, end-stage renal disease, stroke and death. Previous studies have shown that depression and anxiety are independent risk factors for hypertension (Sunbul, Sunbul and Kosker, 2014).

Cardiovascular disease and depression reveal increased medical costs, increased healthcare utilization, and decreased productivity. Furthermore, cardiovascular disease and depression

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greatly affect overall quality of life, even more so for heart failure patients. One can argue that depression may be the most important driver of overall quality of life.(Hare, Toukhsati and Johansson, 2014) Hypertensive patients with depression have an increased risk of myocardial infarction and mortality compared to those without depression. In addition, anxious patients with coronary artery disease are associated with a higher risk of adverse cardiovascular outcomes.(Hare, Toukhsati and Johansson, 2014)

Management of patients with depression and anxiety disorders can be given biologic therapy and psychotherapy.(Siste and Irawati, 2017) Biologic therapies include psychopharmaceuticals and *brain stimulation,* while psychotherapy is an interpersonal, relational intervention used by psychotherapists to help patients or clients deal with their life problems. Usually this involves increasing the individual's sense of well-being and reducing uncomfortable subjective experiences.(Elvira, 2017) There is research on specific psychotherapies given for eight weeks to hypertensive patients that can reduce blood pressure, heart rate and symptoms of depression and anxiety.(Ahmadpanah, Paghale and Bakhtyari, 2014)

Based on the goals to be achieved, psychotherapy can be divided into supportive psychotherapy, reeducative psychotherapy, and reconstructive psychotherapy. The techniques used include ventilative, suggestive, cathartic, expressive, *operant conditioning, modeling,* free association, and interpretive.(Elvira, 2017) There was a previous study involving patients in a group that received psychotherapy for 20 minutes clinically experienced a decrease in blood pressure compared to the group that did not receive psychotherapy. With the many types and techniques of psychotherapy but research related to the Cardiovascular System is still very lacking, so researchers are interested in conducting research by choosing Supportive Psychotherapy with Ventilative Techniques on Blood Pressure and Pulse Rate in Depressed and Anxious Patients.

METHODS

This research is a pretest and posttest experimental design study on the comparative effect of supportive psychotherapy ventilation techniques on reducing blood pressure and heart rate in depression and anxiety symptoms. The decrease in blood pressure and heart rate was assessed with a digital tensimeter.

This study is planned to be held in May - July 2020 and until the sample is sufficient and carried out in the outpatient installation of the Psychiatric Polyclinic of Dr. Wahidin Sudirohusodo Hospital Makassar and its network.

Samples and Sampling Methods

The sample was patients with depressive disorders and anxiety disorders who underwent routine treatment at Dr. Wahidin Sudirohusdo Hospital Makassar and its network. Sampling was done by *purposive sampling*, meaning that sampling was done with the consideration that the subject could provide adequate information to answer research questions.

Estimated Sample Size

Minimum sample size is 12 people per group.

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Selection Criteria

Inclusion Criteria are Age 20-60 years, Male or female gender, Patients with depressive disorders and anxiety disorders based on PPDGJ III, The patient was taking antidepressants and antianxietas at the time of the study, Cooperative and willing to be a research subject. Exclusion criteria are suffering from severe physical and neurological illnesses (such as epilepsy, head trauma and loss of consciousness), suffering from severe mental disorders, such as psychotics and a history of drugs (other than nicotics and caffeine)**,** Refused to be a research subject.

Data Type & Instruments

The type of data in this study is primary data obtained directly from the research subject. Data collection tools and instruments used in this study consisted of medical records and digital tensimeter devices.

Data Collection

The purpose of this study was explained to all subjects and their willingness to participate in the study was requested by agreeing to the informed consent before the examination and treatment. HARS and HDRS Measurements Performed. All subjects were tested for blood pressure and pulse rate using a digital tensimeter before treatment. Provide Ventilation Technique Supportive Psychotherapy for 30 minutes. Blood pressure and heart rate checks were re-checked using a digital tensimeter.

Data Processing Technique & Ethics

Processing is done after recording the research instrument by comparing with other research data. The processed data will be presented in the form of tables and diagrams. Before conducting this research, *ethical clearance* will be requested from the Ethics Commission for Biomedical Research in Humans, Faculty of Medicine, Hasanuddin University and consent will be obtained from the participants. Conducting *informed-consent* before the subject participates in the study, and trying to maintain the confidentiality of the identity of the research subject, so that it is hoped that no party will feel harmed by the research conducted. It is hoped that this research can provide benefits to all parties involved in accordance with the benefits of research previously mentioned.

RESULTS

This study was held from May to July 2020 and until the sample was sufficient and was conducted in the outpatient installation of the Psychiatric Polyclinic of Dr. Wahidin Sudirohusodo Hospital Makassar and its network. A total of 12 samples received treatment and 12 samples were controls.

In accordance with Table 1, it can be seen that gender is balanced between men and women, while the average age is 45 years, with married marital status (62.5%), unmarried (33.3%) and widowed (4.2%). In terms of education, S1 (50.0%) was obtained, then SMA (37.5%) and SD (8.2%). And based on occupation, housewives were found (41.7%), then civil servants (29.2%) and retirees (16.7%). Based on diagnosis F41.2 (37.5%) then F32.2 (25.0%) then F32.11 (20.8%).

Based on Table 1B, it can be seen that for gender, both the treatment and control groups have equal gender between males and females. The mean age of treatment was 46.5 and the mean age of

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control was 45.2. Marital status can be seen as married with the largest number in the treatment and control. While in the S1 education factor, the largest number was also in the treatment and control. Likewise, in the work of housewives, both treatment and control occupied the largest number. For diagnoses in treatment F32.2 and F41.9 have the same order, while control F41.2 ranks first.

Based on table 2, the HARS value of the treatment group is dominant at a moderate level (33.3%) while the control group is also dominant at a moderate level (29.2%). The HDRS value of the treatment group was dominant at moderate level (25.2%) while the control group was severe (16.7%).

Based on Table 3, it can be seen that Systole Blood Pressure before Ventilation Technique Supportive Psychotherapy averaged 145.1 mmHg, decreased to 134.3 mmHg after psychotherapy, with a difference of 10.8 mmHg. Compared to the control group who did not receive psychotherapy, the difference was only 7.4 mmHg. Based on *Pearson test p* 0.001 so that the comparison of BP Systole of both groups is meaningful and the correlation is very strong (0.938). And based on Table 3, it can be seen that Diastole Blood Pressure before Ventilation Technique Supportive Psychotherapy averaged 92.4 mmHg, decreased to an average of 86.6 mmHg after psychotherapy, with a difference of 5.8 mmHg. Compared to the control group who did not receive psychotherapy, the difference was only 5.3 mmHg. Based on *Pearson test p* 0.001 so that the comparison of Diastole BP of both groups is meaningful and the correlation is very strong (0.908).

And if you look at table 3 from the pulse column that the pulse rate before Ventilation Technique Supportive Psychotherapy averaged 89.2 mmHg, dropped to an average of 79.9 mmHg after Psychotherapy, with a difference of 9.3 mmHg. Compared to the control group who did not receive psychotherapy, the difference was only 7.0 mmHg. Based on *Pearson test p* 0.001 so that the comparison of pulse rate of both groups is meaningful and has a strong correlation (0.729).

DISCUSSION

Blood pressure is the pressure used to circulate blood in the blood vessels in the body. The heart, which acts as a muscular pump, supplies the pressure to move the blood and also circulate the blood around the body. Blood vessels (in this case arteries) have elastic walls and provide equal resistance to blood flow. Hence, there is pressure in the circulatory system, even the heartbeat. Blood pushed towards the aorta in systole not only moves forward in the blood vessels, but also creates a pressure wave that travels along the arteries. The palpable pulse is a pressure wave that stretches the artery wall along its journey. (Hall, no date; Sherwood and Ward, 2016)

Depression is a serious mental disorder characterized by decreased mood, anhedonia, loss of interest in daily activities and other symptoms, and is associated with severe consequences including suicide. Depression affects 15% of the population. Standard treatments for 50 years have focused on monoamine neurotransmitters, including *selective serotonin reuptake inhibitors* (SSRIs) and *serotonin-norepinephrine reuptake inhibitors* (SNRIs). The HPA Axis may provide a biological basis for this process, where initial stress leads to functional

hyperactivation of the HPA axis and a tendency towards maladaptive reactions to stress, rather than depressive symptoms themselves. This biological diathesis is then brought out by the acute stressor, leading to the entire cascade of effects described above. When the concept of "stress" is extended from objective external factors to internal psychological stress, the model of stress causing chronic depression lends itself to several psychological theories.(Siste and Irawati, 2017)

Anxiety is a signal that alerts and warns of a threatening danger to enable a person to take action to cope with the threat. Anxiety disorders are a person's abnormal and adaptive overreaction to frightening and dangerous events.(Hall, 1955) Sigmund Freud mentioned that the onset of anxiety can be known from the behavior caused by the individual. Anxiety is closely related to fear, so it can occur unconsciously.(DeBianchedi, DeBoschan and DeCortinas, 1988)

Stimulation of the autonomic nervous system causes specific symptoms - cardiovascular (e.g. tachycardia), muscular (e.g. headache), gastrointestinal (e.g. diarrhea), and respiratory (e.g. tachypnea). These peripheral manifestations of anxiety are not specific to anxiety and are not necessarily related to the experience of subjective anxiety. The James-Lange theory states that subjective anxiety is a response to peripheral phenomena. Some patients with anxiety disorders adapt slowly to repetitive stimuli, and respond excessively to moderate stimuli. The three main neurotransmitters associated with anxiety based on animal studies and response to drug therapy are norepinephrine, serotonin, and gamma-aminobutyric acid (GABA). (Teicher, 1988)

In this study, we investigated potential factors in the form of sociodemographic profiles consisting of gender, age, marital status, education and occupation that may indirectly influence the decrease in blood pressure and pulse rate after receiving supportive psychotherapy treatment with ventilation techniques.

It can be seen that there is a relationship between the above factors, at the age of 45, 8 years and from gender in this study it is arguably balanced, while the education factor is obtained S1 which has more anxiety and depression disorders. While in the work of housewives got the highest percentage followed by civil servants. Some factors that get the first rank are very high to experience anxiety and depression disorders that can affect blood pressure and pulse rate such as age more towards adulthood and above, gender more to women due to hormones, and physical activity that can affect work that can be directed to the work of housewives.

This study used HARS and HDRS to assess the anxiety and depression levels of the sample before blood pressure and pulse measurements were taken, but were not measured again after the measurements were taken. In HARS treatment and control, moderate anxiety was found to be the first level followed by mild anxiety. While in the HDRS treatment, it was found that the level of moderate depression got the first order followed by severe depression. While the HDRS in the control obtained the first rank of severe depression and the second rank of moderate and mild depression. Stressor indicates an unmet need and these needs can be physiological, psychological, social

and environmental. Stress by the body is responded by activating the cardiorespiratory system, locus ceruleus system, metabolic system and HPA axis. It then stimulates the hypothalamus and causes the secretion of corticotrophin relesing hormone (CRH), stimulating the hypothalamus to secretion of ACTH. Increased secretion of ACTH, leads to increased secretion of cortisol. The hormone is secreted to maintain homeostatis in the face of stress, both physical and psychological. To a certain extent, the increase in cortisol is used as an effort to deal with new demands with increased energy needs caused by stressors, both physical and psychological stressors causing an increase in the cardiorespiratory and neurohormonal systems, as a reflection of the autonomic nervous system (ANS) response, one of which is the sympathetic nervous system (SNS).(Herman *et al.*, 2003; Murison, 2016)

Based on the initial HARS and HDRS data, we can use the initial blood pressure and initial pulse rate. When viewed based on table 3, the Systole blood pressure treatment provides a very significant difference when compared to the control after receiving Supportive Psychotherapy ventilation techniques. Likewise with Diastole blood pressure treatment which also gets a very significant difference when compared to the control after getting treatment, a very significant difference. Steffen's previous research conducted psychotherapy research to assess the physiological response of blood pressure in 42 war veterans who experienced PTSD. It was found that the group that received psychotherapy for 20 minutes clinically decreased systolic diastolic blood pressure compared to the group that did not receive psychotherapy. So the physiological stress response is very important to observe in psychotherapy and help evaluate the results of psychotherapy.

For Systole, Diastole and Pulse Pressure based on the *Pearson test* showed a *p* value of *0.001,* where if the *p* value <0.05 indicates meaningfulness between treatment and control and comparison of Systole BP, Diastole BP and pulse rate between the treatment and control groups had a very strong correlation between Systole blood pressure (0.938) and Diastole blood pressure (0.908) and a strong correlation in pulse rate (0.729).

While the pulse rate variable, although not like systole and diastole blood pressure, which obtained very significant results, was quite strongly correlated when the Supportive Psychotherapy ventilation technique was carried out. Steffen's research also assessed the pulse rate of patients who received psychotherapy for 20 minutes and found a decrease in the pulse rate of patients who received psychotherapy. Patients who have received psychotherapy will certainly be able to deal more strongly with stressful conditions and reduce the body's physiological response to stress.(Steffen *et al.*, 2014) Previous studies have found decreased activity in the amygdala during psychotherapy and during a no-psychotherapy condition after mindfulness training. This emotional inhibition during psychotherapy, is due to a shift from sympathetic to parasympathetic dominance which is facilitated by slow, deeper breathing and cardiorespiratory synchronized breathing which influences a decrease in blood pressure and pulse rate. So physiological stress responses are very important to observe in psychotherapy and

help evaluate the outcome of psychotherapy.(Steffen *et al.*, 2014)

CONCLUSIONS

Based on this study, it can be concluded that there is a significant decrease in systolic, diastolic and pulse blood pressure in the treatment group after receiving Ventilation Technique Supportive Psychotherapy when compared to the control.

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Table 1. Sociodemographic Profile of the Study Sample

		N	%
Gender			
	Men	12	50,0%
	Women	12	50,0%
Age	(mean, SD)	45,8	11,2
Marriage Status			
	Marry	15	62,5%
	Unmarried	8	33,3%
	Widow/Widower	1	4,2%

Education			
	SD	2	8,3%
	SMP	1	4,2%
	SMA	9	37,5%
	S1	12	50,0%
Jobs			
	PNS	7	29,2%
	IRT	10	41,7%
	Labor	2	8,3%
	Students	1	4,2%
	Retired	4	16,7%
Diagnosis			
	F32.11	5	20,8%
	F32.2	6	25,0%
	F41.2	9	37,5%
	F41.9	4	16,7%

Table 1B. Sociodemographic Profile of Treatment and Control Groups

		Treatment		Control	
		n	%	n	%
Gender					
	Men	6	25,0%	6	25,0%
	Women	6	25,0%	6	25,0%
Age	(mean, SD)	46,5 ± 14,2		45,2 ± 7,9	
Marriage Status					
	Marry	7	29,2%	8	33,3%
	Unmarried	4	16,7%	4	16,7%

	Widow/Widower	1	4,2%	0	0,0%
Education					
	SD	1	4,2%	1	4,2%
	SMP	0	0,0%	1	4,2%
	SMA	5	20,8%	4	16,7%
	S1	6	25,0%	6	25,0%
Jobs					
	PNS	3	12,5%	4	16,7%
	IRT	5	20,8%	5	20,8%
	Labor	1	4,2%	1	4,2%
	Students	1	4,2%	0	0,0%
	Retired	2	8,3%	2	8,3%
Diagnosis					
	F32.11	2	8,3%	3	12,5%
	F32.2	4	16,7%	2	8,3%
	F41.2	4	16,7%	5	20,8%
	F41.9	2	8,3%	2	8,3%

Table 2. HARS and HDRS Values by Group

	Treatment		Control	
	n	%	n	%
HARS				
Normal	0	0,0%	0	0,0%
Lightweight	4	16,7%	5	20,8%
Medium	8	33,3%	7	29,2%

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Weight	0	0,0%	0	0,0%
HDRS				
Normal	0	0,0%	0	0,0%
Lightweight	2	8,3%	2	8,3%
Medium	6	25,0%	2	8,3%
Weight	4	16,7%	4	16,7%
Very Heavy	0	0,0%	0	0,0%