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Original Research

Effect Of Cognitive-Behavioral Therapy on Depression in Chronic Kidney Disease Patients Undergoing Hemodialysis

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Abstracts

Introduction: Depression is the most common psychiatric disorder suffered by patients with chronic kidney disease who are undergoing hemodialis. Depression can lead to decreased quality of life and increase the economic burden on the health system. CBT is a validated treatment for depression, and there has been no research yet on CBT in patients with chronic kidney disease undergoing hemodialysis in RSUD, Dr. Soetomo Surabaya. To prove the effect of CBT on the improvement of depression in patients with chronic kidney disease undergoing hemodialysis in RSUD, Dr. Soetomo Surabaya. **Methods:** Experimental study with use of randomized, pretest-posttest control group design. Respondents meeting the criteria were divided by random allocation, treatment by CBT for as many as 17 respondents, and even as much control as 20 respondents. The mean age of the treatment group was 37.24 and the control group was 44.45, with a range of 21–60 years old, who experienced mild and moderate depression without antidepressants. Treatment consists of 4 sessions, 45 minutes each session, once a week. Effectiveness was measured using BDI instruments. **Results**: There were significant differences in pre- and post-depression scores in the treatment group ($p = 0.007$), and there were significant differences in depression improvement between the treatment and control groups ($p = 0.006$). Depression improvement in the treatment group was 64.7% compared to the control group's 25.0%. **Conclusion**: CBT can improve mild and moderate depression without antidepressants (NNT = 3) in patients with chronic kidney disease undergoing hemodialysis treatment at RSUD Dr. Soetomo Surabaya.

Keywords: Cognitive-Behavioral Therapy, Depression, Chronic Kidney Disease, Hemodialysis

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INTRODUCTION

Chronic kidney disease is kidney damage for more than 3 months and is divided into five stagings based on glomerular filtration rate (GFR) [1–4]. The prevalence of chronic kidney disease is always increasing and is a major health problem in Indonesia. The incidence of metabolic disease and degenerative disease is increasing, making the number of people with chronic kidney disease increase every year by about 5-10% in stage 5 chronic kidney patients [2]. The most common psychiatric complications due to kidney failure are depression in patients and anxiety in their partners because kidney failure patients undergoing dialysis always depend on machines, procedures, and paramedics for the rest of their lives [5].

The prevalence of depression in end-stage renal disease (ESRD) patients is higher than in the general population [6–11]. Treatment of depressed patients can be in the form of pharmacology and non-pharmacology. Non-pharmacological treatment includes psychotherapy in the form of cognitive-behavioral therapy. The advantage of psychotherapy is not applying drugs to patients with chronic kidney disease who already have a high burden of drug use [6, 12].

Cognitive-behavioral therapy is a form of psychotherapy that uses structured techniques to use logical thinking and correct negative thoughts, behaviors, and mood states [13–15]. Cognitive-behavioral therapy is a validated treatment for depression. Cognitive-behavioral therapy is effective in correcting the patient's mindset bias, helping to overcome depressive symptoms, and preventing relapse [16, 17]. Patients with chronic kidney disease with depression undergoing hemodialysis at RSUD Dr. Soetomo Surabaya so far on average have received pharmacological therapy and supportive psychotherapy; no one has received cognitive-behavioral therapy, and there has never been a study on cognitive-behavioral therapy in patients with chronic kidney disease undergoing hemodialysis at RSUD Dr. Soetomo Surabaya. Seeing the phenomenon of the large number of chronic kidney disease patients undergoing hemodialysis and suffering from depression so that their quality of life is disrupted and the importance of cognitive-behavioral therapy as a treatment option prompted researchers to conduct this research.

The results of this study are expected to optimize treatment for patients with chronic kidney disease with depression undergoing hemodialysis at RSUD Dr. Soetomo Surabaya.

METHODS

This research is a quasi-experimental study using a randomized, pre-test, post-test control group design in chronic kidney disease patients undergoing hemolysis at RSUD Dr. Soetomo Surabaya who met the inclusion criteria for the control and treatment groups were aged 21–60 years, had a minimum education of junior high school, could communicate in Indonesian/Javanese, had HD > 3 months, had depression with a BDI score of 10-29, and without antidepressant therapy, the patient and the patient's family/guardian agreed to participate in the study, cooperative, which was assessed based on the interpersonal behavior observed during the interview. Exclusion criteria for the control and treatment groups were the presence of sepsis as seen on the vital signs examination, there were complications during HD such as hypotension, chills, and shortness of breath, pain scale > 4 based on the Wong-Baker Face Pain Rating Scale, there were psychotic disorders based on the MINI psychotic examination, and there was an idea of suicide.

Random allocation was done by sorting the odd-even; the odd was treated with cognitive-behavioral therapy, and the even was used as a control. Treatment as many as 4 sessions, each session 45 minutes, once a week. Measuring tools used are demographic questionnaires, questionnaires to measure depression with BDI, psychotic with MINI Psychotic, and pain with the Wong-Baker Face Pain Rating Scale, which all take ap-

proximately 30 minutes.

Data was processed using SPSS 17 with a significance level of 5%. The normality test of data distribution was first performed using one-sample Kolmogorov-Smirnov. The effect of cognitive-behavioral therapy on improving depression in the control and treatment groups, using a paired t-test because the data is normally distributed. The difference in depression improvement between those who received cognitive-behavioral therapy and those who did not use the Mann-Whitney test was due to abnormal data.

RESULTS

The initial number of respondents who were willing to take part in the study was 69 people. After the initial data was taken, 29 people were included in the exclusion criteria, so the number of research respondents was 40. Twenty respondents were included in the treatment group and twenty respondents in the control group. During the study, it was found that 3 people (15%) of the respondents in the treatment group had dropped out, with the details of one respondent in the first session refusing to continue participating in the study on the grounds that they felt fine so they did not need therapy, a respondent could not meet at the session first due to moving the hemolysis schedule, and during the second session the respondent did not come to HD, and one respondent in the first session refused because he was tired because he came from out of town, and then in the second session he moved the hemolysis schedule.

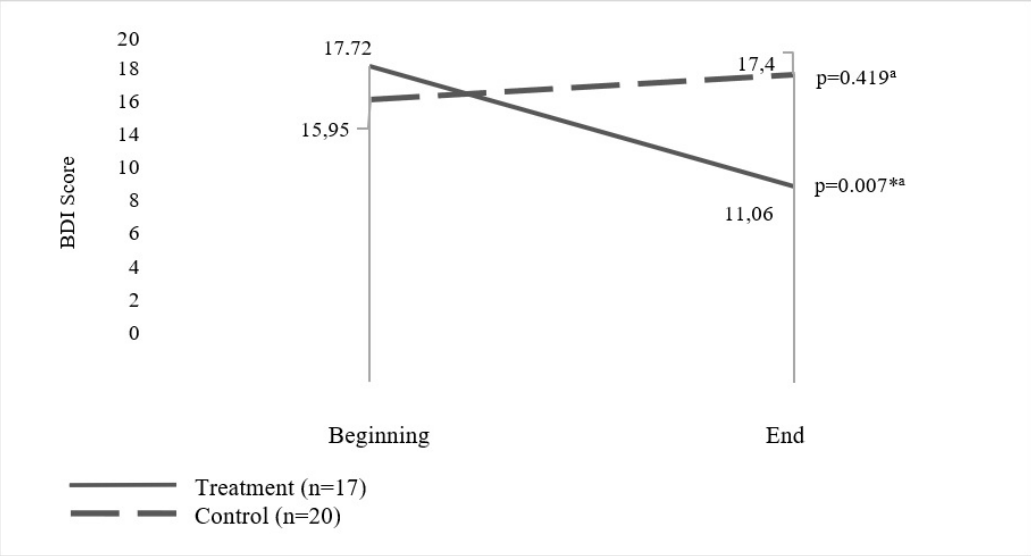
Table 1. Demographic characteristics of chronic kidney disease patients undergoing hemodialysis at dr. Soetomo Surabaya in 2018.

		Treatment		Control		
		n= 17	%	n= 20	%	P
Age	Mean ± SD (95% CI)	37.2 4± 7.645 (33.30-41.17)		44.45± 9.242 (40.12-48.78)		0.015*a
Gender	Man	8	47.1	10	50	1.000b
	Woman	9	52.9	10	50	
Address	Surabaya	15	88.2	16	80	0.667b
	Outside Surabaya	2	11.7	4	20	
Religion	Islam	16	94.1	19	95	1.000b
	Christian	1	5.9	1	5	
Ethnic	Java	15	88.2	18	90	1.000b
	Madura	1	5.9	1	5	
	Others	1	5.9	1	5	
Education	Mid-school graduate	4	23.5	3	15	0.405c
	Didn't graduate in high school	1	5.9	0	0	
	Graduate high school	8	47.1	11	55	
	Bachelor	4	23.5	6	30	
Marital Status	Not married yet	3	17.6	2	10	0.423b
	Married	13	76.5	16	80	
	Divorce	0	0	2	10	
	Death divorce	1	5.9	0	0	
Job	Doesn't work	9	52.9	10	50	1.000b
	Civil servant	1	5.9	2	10	
	Private employee	2	11.8	3	15	
	Retired	0	0	1	5	
	Others	5	29.4	4	20	
Monthly	< 1.000.000	7	41.2	9	45	0.909c
	1.000.000 – 3.000.000	6	35.3	6	30	
	>3.000.000	4	23.5	5	25	

		Treatment		Control		
		n= 17	%	n= 20	%	P
Period of hemodialysis therapy	3-6 months	2	11.8	1	5	0.618[c]
	6 months -2 years	5	29.4	6	30	
	>2 years	10	58.8	13	62.2	
Hereditary	Yes	0	0	1	5	1.000[b]
Depression	No	17	100	19	95	
Families with	Yes	3	17.6	2	10	0.644[b]
Kidney	No	14	82.4	18	90	
History of	Yes	4	23.5	1	5	0.159[b]
	No	13	76.5	19	95	
Other	Yes	1	5.9	0	0	0.459[b]
problem	No	16	94.1	20	10	

*Significant when P<0.05

[a]Comparison test with free sample t2 test
[b]Comparison test with Chi-Square test
[c]Comparison test with Mann-Whitney test



*Significant if p<0.05; aPaired t test

Picture 1. Description of early and late depression in chronic kidney disease patients undergoing haemodialysis in the treatment group that received cognitive-behavioral therapy and the control group at dr. Soetomo Surabaya in 2018.

Statistically, in the treatment group, the final depression score decreased significantly, p = 0.007, which means that depression was improved after cognitive-behavioral therapy.

Table 2. The difference in the improvement of depression in chronic kidney disease patients undergoing haemodialysis between those who received and those who did not receive cognitive-behavioral therapy at dr. Soetomo Surabaya in 2018.

		Depression			Total	P*
		Improved	Fixed	Worsened		
Group	Treatment	11	6	0	17	0.006
		64.7%	35.3%	.0%	100.0%	
	Control	5	10	5	20	
		25.0%	50.0%	25.0%	100.0%	
Total		16	16	5	37	
		43.2%	43.2%	13.6%	100.0%	

*Mann-Whitney test, significant if p<0.05

Statistically, there was a significant difference in improving depression scores between the treatment and control groups.

The NNT (number need to treat) results show the number of patients who must be treated to obtain 1 additional good result or avoid 1 failure [18], with formula:

$$= \frac{1}{CER-EER} = \frac{1}{(5/20)-(11/17)} = -2.5 \sim 3$$

DISCUSSION

During the study, the dropout rate in patients with chronic kidney disease undergoing hemodialysis could be high. According to the researchers, this is probably due to the organic condition, which causes signs and symptoms that make the patient uncomfortable and makes the patient physically weak, so that on the way the patient feels uncomfortable participating in therapy and prefers to rest while undergoing hemolysis.

At the beginning of the study with statistical calculations, data on gender, address, religion, ethnicity, education, marital status, occupation, monthly income, length of time undergoing hemodialysis, hereditary depression, family factors with kidney disease, history of previous depression, and other psychosocial problems were seen. in the treatment group and the control group derived from a homogeneous sample.

The age of the respondents was not homogeneous, where the age in the control group was older than the treatment group; this was probably because the researchers used a randomization system in an odd-even way where odd was included in the treatment group and even was the control group. The age of the respondent does not affect the research results because it has already been determined to be 60 years, where in general, at the age of > 60 years, it is starting to show signs of cognitive decline [19].

The BDI score in the treatment group before cognitive-behavioral therapy was greater than in the control group. This is probably because the number of female respondents in the treatment group was greater than that of the male. In chronic diseases, more women experience depression than men [20].

After the cognitive-behavioral therapy was carried out in the treatment group, there was a decrease in depression scores. These results are in line with previous studies conducted at two dialysis centers in New York that showed that cognitive-behavioral therapy reduced BDI scores in the treatment group. In that study, the cognitive-behavioral therapy treatment was carried out for 10 weeks, and each session was 60 minutes without drugs. Only two respondents used antidepressants at a stable dose for several years [8]. In this study, it was carried out for 4 weeks; each session was 45 minutes and without antidepressants. With cognitive-behavior therapy, cognitive restructuring of distorted thoughts occurs in patients with kidney failure who experience depression and anxiety. Respondents are encouraged to express their behavior and/or thoughts related to symptoms of depression and anxiety in an organized way, and then respondents are taught to replace distorted thoughts with more useful ones or function to manage their negative moods [21].

The control group in this study showed an increase in BDI scores in the posttest even though it was not statistically significant. This is different from the previous study by Cukor et al. (2014), which showed a decrease in BDI scores in the control group, but the magnitude of the decrease in BDI scores was significantly greater in the treatment group. The increase that occurred in this study was due to a respondent who experienced a very large addition to his depression score, which increased the overall depression score. At that time the respondent experienced problems with her husband, namely the husband was known to be having an affair.

In this study, there was a significant difference in improving depression between those who received cognitive-behavioral therapy and those who did not receive cognitive-behavioral therapy; this means that

cognitive-behavioral therapy is effective for reducing depression scores in patients with chronic kidney disease undergoing hemolysis without antidepressants. This is in accordance with research by Cukor et al. [8] which reported a randomized clinical trial using cognitive-behavior therapy in chronic kidney patients undergoing haemodialysis with BDI instruments without antidepressants, there was a decrease in depression scores.

Besides that, several researchers also reported a significant decrease in depression scores in the cognitive-behavioral therapy treatment group in chronic kidney patients undergoing haemodialysis with BDI instruments [22, 23] as well as a significant decrease in anxiety [24] and improving quality of life [21].

Cognitive-behavior therapy can reduce depression scores through anger control, courageous behavior, problem-solving skills, self-control, and relaxation training [25]. In addition, patients who can talk about their feelings and concerns about kidney disease with the help of cognitive-behavioral therapy have lower depression scores [22]. This is because during cognitive-behavioral therapy, the therapist, in this case the researcher, helps the respondent to become aware of maladaptive automatic thoughts that arise in his mind and lead to negative personal interpretations. Researchers use Socratic dialogue to encourage the emergence of alternative ideas so that respondents conduct behavioral experiments to test these alternative behaviors which in the end the respondents have new, more realistic perspectives and actions. Thinking rationally causes a decrease in emotional responses and negative emotion regulation [12, 26].

The number of respondents in the treatment group whose BDI score did not improve was 6 people, this is probably because this study used a short time, namely 4 meetings. Briefly cognitive-behavioral therapy is useful in primary care patients with anxiety and depression related medical conditions and not in all problems. More intensive treatment is needed if there are problems with axis II or comorbidities with drug dependence [27].

This research has limitations, namely it does not use a standardized questionnaire for data on psychosocial problems, but it is obtained from interviews so that the assessment is responsive. Besides that, the questionnaire used to evaluate depression uses an inventory, where the respondents fill it out themselves so that this condition is less objective.

CONCLUSION

The results of this study indicate that cognitive-behavior therapy is effective for improving mild and moderate depression without using drugs with three people being given cognitive-behavioral therapy to make depression better (NNT = 3) in patients with chronic kidney disease undergoing haemodialysis at RSUD Dr. Soetomo Hospital, Surabaya.

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CONFLICT OF INTEREST

All authors declare no conflict of interests.

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