



THE COGNITIVE BEHAVIORAL THERAPY REDUCES DEPRESSION IN CHRONIC KIDNEY DISEASE PATIENTS UNDERGOING HEMODIALYSIS

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ABSTRACT

Chronic kidney disease is a global health problem with increased prevalence and incidence of kidney disease, poor prognosis, and high cost. Psychological problems occur, one of which is depression. Various interventions are needed to reduce depression including Cognitive behavioral therapy. The aim is to determine the effectiveness of cognitive-behavioral therapy on depression in chronic kidney disease patients. This is a quasi-experimental pre-post test with a control group with cognitive behavioral therapy intervention. A total is 40 patients with chronic kidney disease undergoing hemodialysis and experiencing depression in two hospitals in Bogor were included in the study during the period from March 2020 to December 2020. The data analysis used is the Wilcoxon test and Man U Whitney test. The results have shown that depression decreased in patients with chronic kidney disease after cognitive behavioral therapy (p-value= 0,036). These results suggest that cognitive-behavioral therapy is a promising intervention for treating depression in chronic kidney disease patients.

Keywords: cognitive behavioral therapy; chronic renal disease; depression

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INTRODUCTION

Chronic kidney disease is a global health problem with increased prevalence and incidence of kidney disease, poor prognosis, and high cost. The results from systematic review and meta-analysis showed that global CKD prevalence of between 11 to 13% with the majority stage 3. (Hill et al., 2016) The prevalence of non-communicable diseases has increased compared to Riskesdas 2013, including cancer, stroke, chronic kidney disease, diabetes mellitus, and hypertension. Chronic kidney disease has increased from 2% to 3,8%. (Kemenkes RI, 2019).

The *Data United States Renal Data System (USRDS)*, Patients undergoing hemodialysis experience increased rates of morbidity and hospitalization related to infection. Between the years 1993 until 2012 the number of ESRD patients with infections hospitalized increased to 34%. (Saran et al., 2015). This situation contributed to 15% of the causes of death in ESRD patients. (Martinez, Esteve, Yeste, Paredes, & Llagostera, 2019). Death on patients undergoing hemodialysis in 2015 was recorded at 1.243 people with a length of life with HD 1-17 months. The highest proportion in patients with HD is 6-12 months. (Pusdatin.kemkes., 2017).

Chronic kidney disease is a disorder characterized by a gradual and usually permanent loss of kidney function resulting in kidney failure. Irreversible and progressive decline in kidney function in which both kidneys have been damaged by various diseases so that they cannot remove metabolic products from the blood and cannot regulate the body's electrolyte composition and the body's acid-base balance. (Renke et al., 2017). Progressive decline in kidney function over months or years in chronic kidney disease occurs when kidney damage and/or a decrease in Glomerular Filtration Rate (GFR) is less than 60mL/min/1.73 m² for at least 3 months. . (Andrassy, 2013) The common causes of chronic kidney disease are diabetes and high blood pressure, which is about two-thirds of all cases. (National Kidney Foundation. et al., 2018)

Management of chronic kidney disease is depending on the stage of chronic kidney disease and if its function is less than 10-15% then dialysis treatment or kidney transplantation must be carried out to survive. Hemodialysis is a process of purifying the blood by the accumulation of waste. It is used for patients with end-stage renal failure or acutely ill patients who require short-term dialysis. Hemodialysis does not cure or reverse kidney disease and cannot compensate for the loss of metabolic or endocrine activity carried out by the kidneys. (Smeltzer, 2017)

The study has shown the problems that occur in chronic kidney disease patients with hemodialysis are financial difficulties, changes in social relationships, and marriage. (Leung, 2003) Stressors that occur in chronic kidney disease patients undergoing dialysis are financial difficulties, changes in social and marital relationships, visiting the hospital regularly, limited vacation time, restrictions on free time, problems in relationships with nurses and medical staff, fear of disability or death, increased dependence on dialysis machines, uncertainty about the future and physical exhaustion. (Gerogianni & Babatsikou, 2013)

Depression is the most psychological problem experienced by patients with chronic kidney disease undergoing hemodialysis and hurts social, economic, and psychological well-being. (Anees, Barki, Masood, Ibrahim, & Mumtaz, 2008). Depression is associated with important aspects of the clinical course, including mortality, increased number of hospitalizations, decreased medication adherence , and decreased quality of life. (Chan et al., 2011)

Research has found that depression is responsible for the highest annual mortality of hemodialysis patients in Pakistan, compared to patients in Western countries. (Hedayati et al., 2008). The incidence of depression is 73% and most of the patients fall into the category of moderate to severe depression. (Anees M, Barki H, Masood M, Ibrahim M, Mumtaz A, 2008). A total of 21% of them experienced a depressive disorder, 20% had severe depression, 9% had unspecified depression and 21% experienced an anxiety disorder. (Cukor et al., 2007)

The American Psychiatric Association guidelines revised in 2010 mention the provision of psychotherapy, particularly cognitive-behavioral therapy (CBT), and selective reuptake inhibitors (SRI) as the treatment of choice for patients with nonpsychotic major depression. (American Psychiatric Association, 2010). Depressive symptoms were markedly improved in patients who completed 12 weeks of treatment with sertraline, bupropion, or nefazodone. (Finkelstein, Wuerth, Troidle, & Finkelstein, 2008). Depression scores were significantly reduced in end-stage renal disease patients treated with fluoxetine compared with patients not receiving depression treatment. (Koo et al., 2005). Psychosocial interventions such as CBT (cognitive behavioral therapy), rational-emotive therapy, and ATP (adaptation training program) reduces the beck depression index score in depressed patients. (Xing et al., 2016).

Psychoeducation reduces depression scores but does not reduce depression in hemodialysis patients. (Espahbodi, Hosseini, Mirzade, & Shafaat, 2015)

Cognitive behavioral therapy (CBT) is a short-term treatment that aims to change thought patterns or behaviors that may contribute to worsening various mental or physical health problems. (Blane, Williams, Morrison, Wilson, & Mercer, 2013). *National Institute for Health and Clinical Excellence* (NICE) recommends CBT for the treatment of a variety of mental health conditions, including depression, anxiety, post-traumatic stress disorder (PTSD), obsessive-compulsive disorder (OCD), and bulimia nervosa. CBT can also be used in sleeping disorders, to treat a variety of physical health problems such as pain and fatigue, as well as for phobias, substance abuse disorders (including smoking cessation), and functional disorders/symptoms that cannot be explained medically.

The study aims to determine the effectiveness of cognitive-behavioral therapy on depression in chronic kidney disease patients undergoing hemodialysis. The increase in CKD patients undergoing hemodialysis, the high rate of depression in dialysis units, and the importance of psychological intervention for depressed patients undergoing hemodialysis and to improve mental health services are the background of the importance of this study.

METHOD

This study uses a quasi-experimental pre-post test design with a control group" with Cognitive behavioral therapy (CBT) intervention. This study was approved by the Ethics Committee from Poltekkes kemenkes Bandung, Jawa Barat, Indonesia (No. 24/KEPK/EC/XII/2020). All respondents were given informed consent and approved of this study. The submission of informed consent was attended by a nurse in dialysis unit and one patient's family. The study was conducted at two hospitals in Bogor, during the period from March 2020 to December 2020. Total samples are 40 patients were recruited from the list of patients CKD who experienced depression in dialysis unit. Participants were divided into two groups, the intervention group of 20 patients and the control group of 20 people. The intervention and control groups did not know each other and were in different hospitals with a distance of 10 km between the two hospitals.

Screening of chronic kidney disease patients who experience depression using the Patient Health Questionnaire (PHQ 9) instrument which contains 9 questions with a score of 0-3 and a total score of 0-27. The reliability test found that Cronbach's alpha was 0.89 among 3,000 primary care patients and 0.86 among 3,000 OBGYN patients. Construct validity found that the correlation coefficient between the PHQ-9 and the SF-20 mental health scale was 0.73. sensitivity of 88% and specificity of 88% in 580 individuals. (Kroenke, Spitzer, & Williams, 2003) The inclusion criteria are as follows: Age 20-75 years, doing hemodialysis \geq 6 months, compos mentis, conscious, can do activities, can be interviewed, and willing to be a respondent. The first is an instrument about respondents' demographic (age, sex, marital status, education, occupation, income). The second is a Patient Health Questionnaire (PHQ 9) instrument, to measure the level of depression in CKD patients.

Cognitive-behavioral therapy was performed after data collection. The steps taken are five CBT steps. Step one is an assessment of patients include the experience of negative thoughts, negative feelings, and behaviors related to stressors and negative experiences. Step two is cognitive therapy includes reviewing automatic thinking and evaluation of rational responses by the patient independently and exercises to overcome negative thoughts. Step three is behavioral therapy includes re-identify automatic thoughts, evaluate rational responses to

automatic thoughts, identify the negative behavior that needs to be changed, exercise a new positive behavior. Step four is to evaluate the cognitive and behavioral therapy includes re-identify negative thoughts and negative behaviors and evaluate newly learned behavior. Step five is relapse prevention includes re-evaluate negative automatic thoughts and negative behaviors, the importance of treatment, and maintaining positive thoughts and behaviors.

Data were analyzed and processed using a computer program system. Data were analyzed by univariate and bivariate. Sociodemographic characteristics were processed using univariate and bivariate to determine the mean, standard deviation, and p-value. The Skewness test has shown that the data was not normal distribution and a non-parametric test was carried out. The intervention and control groups were analyzed and processed using the Wilcoxon test and the man u Whitney test.

RESULTS

Table 1
 Distribution of respondents by age

| Variable | group | N | Mean | Median | SD | Min-Max | p-value |
|----------|--------------|----|------|--------|-------|---------|---------|
| age | Intervention | 20 | 53 | 54 | 12,34 | 24-73 | 0,807 |
| | control | 20 | 52 | 54 | 12,42 | 24-73 | |

Table 1 demonstrates the average patient's age is 53 years old, the lowest is 24 years old and the highest is 73 years old. There is no difference in age between the intervention and control groups. (p-value =0,807)

Table 2.
 Sociodemographic Characteristics

| Variable | category | Intervention group (n=20) | | Control group (n=20) | | amount | | p-value |
|------------------------|---------------|---------------------------|------|----------------------|----|--------|------|---------|
| | | f | % | f | % | f | % | |
| | | Sex | Male | 7 | 35 | 8 | 40 | |
| | Female | 13 | 65 | 12 | 60 | 25 | 67,5 | |
| Marital status | Married | 14 | 70 | 19 | 95 | 33 | 2,5 | 0,032 |
| | Not married | 1 | 5 | 1 | 5 | 2 | 5 | |
| | Widow/widower | 5 | 25 | 0 | 0 | 5 | 12,5 | |
| Educational background | none | 3 | 15 | 0 | 0 | 3 | 7,5 | 0.80 |
| | middle school | 6 | 30 | 7 | 35 | 13 | 32,5 | |
| | High School | 6 | 30 | 11 | 55 | 17 | 42,5 | |
| | college | 5 | 25 | 2 | 10 | 7 | 17,5 | |
| occupation | employed | 13 | 65 | 16 | 80 | 29 | 72,5 | 0,30 |
| | unemployed | 7 | 35 | 4 | 20 | 11 | 27,5 | |
| Income | Low | 15 | 75 | 15 | 75 | 30 | 75 | 1,00 |
| | Upper middle | 5 | 25 | 5 | 25 | 10 | 25 | |

Table 2 demonstrates that there are no difference between the intervention and control groups in sex (p-value =0,747), educational background (p-value =0,80), occupation (p-value = 0,30), income (p-value=1,00). The difference between the intervention and control groups was found in marital status (p-value =0,032).

Table 3.
 Depression in CKD patients before cognitive behavioral therapy

| Group | N | Mean | p-value |
|--------------|----|------|---------|
| Intervention | 20 | 9,50 | 0,39 |
| Control | 20 | 8,20 | 3,15 |

Table 3 show that the depression in CKD patients no difference between the intervention and control groups in depression before CBT (p-value = 0.39)

Table 4.
 Depression in CKD patients before and after the cognitive-behavioral therapy

| Group | | N | Mean | p-value |
|--------------|--------|----|------|---------|
| Intervention | Before | 20 | 9,50 | 0,036 |
| | After | 20 | 6,10 | |
| Control | Before | 20 | 8,20 | 0,083 |
| | After | 20 | 8,25 | |
| | | | 0,16 | |
| | | | 0,05 | |

Table 4 show that there are a difference in depression before and after CBT in intervention group (p -value = 0.036) and no difference in depression before and after in control group (p-value = 0,083).

Table 5
 Depression in CKD patients after the cognitive behavioral therapy

| Variable | N | Mean | p-value |
|--------------|----|------|---------|
| Intervention | 20 | 6,10 | 0, 047 |
| Control | 20 | 8,25 | 3,15 |

Table 5 show that there are differences in depression between the intervention and control groups after the CBT (p-value = 0.047).

DISCUSSION

The results of this study have shown that depression in CKD patients decreases before and after CBT, while in the group without CBT intervention there was no difference in depression in CKD patients. Depression is a rejection of happiness and feelings of worth, psychomotor delay, and withdrawal, loss of interest in the environment, somatic complaints, worry or tension, rejection of anger, difficulty controlling thought processes. (Halgan, Richard P Whitbourne, 2010). In this study, there was a decrease in depression in CKD patients after cognitive behavioral therapy was carried out. This is consistent with research that CBT is an effective treatment strategy for depression and combination treatment with pharmacotherapy is significantly more effective than pharmacotherapy alone. (Fennell, Gelder, Andreasen, Lopez-Ibor, & Geddes, 2012). Research on 24 addiction patients in Iran showed that Cognitive behavior therapy reduced levels of depression and stress in patients. (Alamdarloo, Khorasani, Najafi, Jabbari, & Shojaee, 2019).

Depressive disorder is one of the most common psychiatric disorders affecting people of all ages in all regions of the world. Women are affected twice as much as men. This study also showed that depression in chronic kidney disease patients experienced more depression in women (67.5%) than men (32.5%). This corresponds with the global annual prevalence in 2010 where the prevalence of major depression is higher at 1.7 in women than in men. (Albert, 2015).

The high rate of depression in women occurs for many reasons, ranging from biological, psychological, and socio-cultural factors. Biological factors are caused by women experiencing many changes in hormone levels, for example during menstruation, pregnancy, miscarriage, childbirth, and menopause. Changes in hormone levels can affect the part of the nervous system that deals with mood. Psychological factors are caused in life, women go through many phases such as education, career, household, and others. Women tend to be more careful and think about many things when making life choices, which can lead to overthinking. When facing life's problems, women show sensitivity to interpersonal relationships, such as relationships with friends, family, coworkers, and even partners, while men show more sensitivity to external careers. Socio-cultural factors are influenced by the existence of culture, women must have certain attitudes such as being gentle, being able to care for and educate children, must be sensitive to other people, etc. This assessment and culture are prone to making women define themselves through the opinions of others and this will affect their mental health.

In this study, CBT was performed on patients with chronic kidney disease undergoing hemodialysis and experiencing depression. Depression is a common problem in adult patients with chronic kidney disease (CKD), including end-stage renal disease (ESRD) because it is associated with biological and psychosocial changes, poor quality of life, and increased mortality. Research shows that depression is experienced in 81% of chronic kidney disease patients undergoing dialysis. (Hedayati et al., 2009).

Cognitive behavior therapy (CBT) is one of the evidence-based psychological interventions for the treatment of several psychiatric disorders such as depression. The theory that underlies this therapy is the cognitive theory developed by Aeron Beck. The theory explains that during cognitive development a person learns inappropriate habits to process and interpret information. Cognitive therapy seeks to correct the client's cognitive distortions and help him or her learn a variety of different and more realistic ways to process and test the reality of information. (Nelson-Jones, 2014). Individual differences in maladaptive thought processes and negative judgments of life events lead to the development of dysfunctional cognitive reactions. This cognitive dysfunction is responsible for residual symptoms in the affective and behavioral domains.

Depression in patients with chronic kidney disease occurs because emotional disturbances come from thinking distortions (deviations) so that without changing the mindset it will reduce the patient's quality of life, where chronic disease patients undergoing hemodialysis are susceptible to situations that are stifling (stressful) or have negative consequences (aversive). This situation is related to biological and psychological changes in the effects of hemodialysis, high mortality, low cure rates.

Cognitive behavior therapy (CBT) in this study was conducted to correct cognitive distortions, negative emotions, maladaptive behaviors that often occur in depressed patients. In this study, patients were trained to identify cognitive distortions, negative emotions, and

maladaptive behaviors that emerged and their impact on themselves and others. Next, patients were asked to replace cognitive distortions with positive thoughts and behaviors, and patients were also taught coping strategies to overcome the emergence of cognitive distortions and negative behaviors. Strengthening coping strategies will increase the patient's ability to overcome various problems that arise as a result of the disease as well as the side effects of the treatment carried out.

Management of mental health problems can be carried out in patients with chronic kidney disease who are undergoing hemodialysis by providing psychological interventions such as psychotherapy, counseling, cognitive therapy, behavioral therapy, stress management, and various other psychological interventions. Health education about nutrition, diet, and maintaining a healthy lifestyle is important for the patients. Group support for patients and families can be done through support groups or self-help groups. In general, the management of depression in chronic kidney disease patients is carried out for symptom control, optimizing the patient's role and function, reducing the risk of disability/mortality, improving a good quality of life; and reduce suicide rates.

Limitation

The limitation of this study is the small number of samples due to the COVID-19 pandemic situation, so the hospital carries out very strict screening for patients who will be respondents in the study. This study was conducted with the health protocol applied by the hospital.

CONCLUSIONS

Depression in chronic kidney disease patients undergoing hemodialysis decreased with cognitive-behavior therapy compared to patients who were not given cognitive-behavior therapy.

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