

Cognitive behaviour Therapy (Cbt) to Reduce Post Ischemic Stroke Depression

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Abstract.Background: Stroke patients with PSD at the second week, third month, and sixth month after the attack are at risk of having recurrent strokes. Cognitive-behavioral therapy (CBT) intervention identifies and changes negative thought patterns and behaviors that lead to physical-emotional disorders. This study aims to determine the effect of cognitive behavior therapy (CBT) on reducing depression in post-stroke ischemia patients. The study was conducted with a quasi-experimental design conducted on 80 respondents divided into 40 respondents in the intervention group and 40 respondents in the control group selected by consecutive sampling technique. CBT intervention was given to control group respondents for 3 days. Post-ischemic stroke depression scale assessor using the HDRS instrument. The analysis was performed using univariate analysis and bivariate analysis using a statistical t test. It was found that the CBT intervention given to the intervention group showed a decrease in the depression score of post-ischemic stroke patients compared to the depression score of post-stroke patients in the control group (p value 0.000). CBT intervention given to patients with post-stroke depression is able to have a good effect on reducing depression in post-stroke ischemic patients. Health services that provide care services for patients with post-ischemic stroke depression are advised to provide CBT interventions to patients to reduce post-ischemic stroke deepest scores.

Keywords: cognitive behavioral therapy, post-ischemic stroke depression

1. Introduction

World Health Organization (WHO) in 2012 estimated that the death caused by stroke was 6.7 million people. The prevalence of stroke in Indonesia increased from 8.3/1000 in 2007 to 12.1/1000 in 2013 [1]. The number of Indonesian people based on a survey by the central statistic agency in 2010 was 237,641,326, meaning more than 2.8 million Indonesians were suffering from strokes. In Central Java, the number of stroke cases was 17.75 thousand in 2013, 13.25 thousand in 2014, and a total of 7 thousand in the first quarter of 2015. The number of stroke cases in 2014 in Semarang City was 2,951, with details of 801 hemorrhagic strokes and 2141 ischemic strokes [2].

Stroke is one of the causes of death due to the acute phase and sequelae and changes in quality of life [3]. Due to stroke in Semarang City, the death rate was 277 in cases of hemorrhagic stroke and 258 in cases of ischemic stroke [2]. Stroke death associated with language and speech disorders, paralysis, incontinence, cognitive impairment, depression, and other comorbidities. Depression in stroke patients is called Post Stroke Depression (PSD). PSD picture of ischemic stroke patients at RSUP Dr.Karyadi Semarang was 33.3% of ischemic stroke patients with mild depression, 31.1% had moderate depression, 14.4% had major depression, and 21.1% had no depression [4]. *Post Stroke Depression* has a special pattern, namely increasing within 14 weeks or three months after a stroke. The increase in PSD within 14 weeks is evidenced by a high prevalence, ranging from 17.7 to 47.7% [5]. However, PSD can also continue for up to six months to one year [6].

At the beginning of the attack, PSD was related to emotional coping, namely acceptance ($\rho < 0.01$) as well as motor and sensory dysfunction ($\rho < 0.05$). After 3 months of attacks, PSD is associated with emotional coping, namely denial ($\rho < 0.01$) reception ($\rho < 0.01$), blame yourself (ρ

0.01) [7]. *Post Stroke Depression* after three months, the attack can have an impact. Namely, disability, persistent depression, suicidal thoughts, and fatigue, decreased quality of life for stroke patients, and recurrent strokes [8]. Stroke patients with PSD at the second week, third month, and sixth month after the attack had a risk of recurrent stroke 1.49 times than those without PSD [9]. Patients with recurrent strokes will also have an impact on lower quality of life.

Death is a further result of PSD. In an eight-year prospective cohort study, it was found that the mortality of patients with stroke and depression was 1.88 times that of the patients without stroke and depression. In the survival analysis, patients with depression before and after having a stroke had *hazard ratio* 1.7 times that of patients without depression before and after a stroke [10]. In the meta-analysis, PSD was associated with mortality. *Hazard ratio* the mortality in stroke patients who experienced depression after stroke was 1.52 times [9]. Intervention needs to be done so that the emotional process in stroke patients is good. The PSD management is with deanxit, fluoxetine, setraline, paroxetine, and citalopram. This treatment provides a therapeutic effect at six to eight weeks after onset [11]. However, depression can return at months three, six, twelve and twenty-four [12]. Medication management accompanied by psychological therapy can make the patient better than medication only.

Research to overcome PSD is still in the *pilot study* stage in 2015. *Pilot study* therapy *cognitive behavior therapy and activation behavior (AB)* to address PSD is being developed [13]. An intervention in overcoming depression related to acceptance, denial, and self-blame is cognitive behavior therapy (CBT). CBT is able to improve the patient's ability to integrate with the condition experienced. CBT can decrease social anxiety in various populations, improving self-management [14] [15].

Implementation of CBT, the counselor, and the client work together to identify and change negative thought patterns and behaviors that cause physical-emotional disorders. The focus in this therapy is trying to change thoughts or self-talk (*self-talk*). According to a meta-analysis, it is effective in treating anxiety, depression, and somatic disorders [16]. However, there are no quasi-experimental studies that prove the effect of CBT on progression in ischemic stroke patients.

Ischemic stroke patients need intervention using CBT so that PSD can be controlled. The absence of PSD in ischemic stroke patients can improve quality of life and prevent a greater risk of disability and disability. Neurogenesis can also be enhanced in the absence of PSD. Optimal neurogenesis can accelerate cellular recovery.

Stroke patients are increasing from year to year. The impact of stroke can lead to paralysis, both permanent and temporary, the cost of treatment is high, requires a long treatment. This results in post-stroke patients experiencing depression, which can reduce the patients' quality of life. Various studies have found that CBT can reduce depression, but the effect has not been found in stroke ischemic patients. Based on the formulation of the problem, a research question is: "Is *cognitive behavior therapy* can reduce depression after stroke ischemia?. This study aims to determine the effect of cognitive behavior therapy (CBT) on reducing depression in post-stroke ischemia patients.

2. Methode

The design of this study is quasi-experimental. In this study, there was an intervention in the treatment group to know the effect of the intervention, but some of the variables that influenced it could not be controlled. This study explores the effect of CBT on depression in post-stroke ischemic patients, which is differentiated in the intervention group and the control group. The population in this study were post-stroke patients at the Puskesmas Semarang Regency, with a total sample of 40 respondents in each group selected by a consecutive sampling method. Depression assessment using HDRS consists of 24 questions. In the initial stage of the study, the researcher took a pretest measurement, namely measuring depression in post-stroke ischemia patients. This is followed by providing intervention in CBT, consisting of 3 stages, and is carried out for 3 days. On the fourth day, post-stroke ischemic depression was measured. Data analysis

was performed by univariate test for all variables. Bivariate analysis was carried out in pairs on all independent variables with the dependent variable.

3. Results

Table 1.

Post-ischemic stroke depression score overview before being given CBT intervention

Variable	Social group	Mean	Elementary School	Min	Max	P value
Pre depression score	Intervention	30.90	5,4	14	38	307
	Control	32:15	5,4	21	46	

Based on table 1, it is found that the average score of depression in the intervention group before being given CBT intervention is 30.90, with the lowest value 14 and the highest score 38. And the mean score of depression in the control group before being given CBT intervention was 32.15, with the lowest score 21 and the highest score 46. Depression scores before being given CBT intervention in the control group, and the intervention group did not show any difference or have the same value (p value 0.307).

Table 2.

Difference in score post-ischemic stroke depression before and after CBT intervention

Variable	Social group	Difference in Mean	Elementary School	Value of t	P value
Pre-post depression score	Intervention	11.77	3.0	24.6	0.000
	Control	5.67	5-9	6.0	0.060

Based on table 2, it is found that the difference in depression scores in the intervention group before and after being given CBT intervention is 11.77, and there is a significant difference between depression scores in the intervention group before and after being given CBT intervention (p value 0.000). While the difference in depression scores in the control group before and after was 5.67, and there was no significant difference between depression scores in the intervention group before and after (p value 0.060).

Table 3

Effect of CBT intervention on post-ischemic stroke depression scores

Variable	Social group	Mean	Elementary School	Min	Max	P value
Post depression score	Intervention	19:13	6.6	0	30	0.000
	Control	26.48	7-2	14	38	

Based on table 3, it is found that the average score of depression in the intervention group after being given CBT intervention is 19.13, with the lowest value 0 and the highest score 38. And the mean score of depression in the control group after being given CBT intervention was 26.48, with the lowest score of 14 and the highest score of 38. The CBT intervention given to the intervention group showed a decrease in the depression score of post-ischemic stroke patients compared to the depression score of post-stroke patients in the control group (p value 0.000).

4. Discussion

The results showed that the two groups, before being given the intervention, had moderate depression. Based on this study, before being given CBT, it was found that the moderate category was 70% in the intervention group, and in the control group 68.7% with a decrease in the level of mild depression. Signs and symptoms of depression levels in respondents based on the data obtained are still many who have depression, therefore due to the lack of control of anxiety, anxiety that causes depression for respondents.

Based on the table above, it appears that there was a change in before and after being given CBT in the symptomatic dimensions of depression of both respondents Research. In the table above, it is known that the research subject has experienced depressive symptoms. Research subjects showed a change in the value of the depression dimension after being given CBT, namely in the negative emotional dimension, there was a decrease in frequency, in the unmotivated dimension, there was an increase in frequency and in the physical complaint dimension, there was a decrease in frequency between before and after the intervention. For the depression dimension, negative thoughts in both study subjects showed no change or still in the same category.

CBT is a form of psychological intervention that aims to help individuals recognize, put first, and connect thoughts, feelings, and physical symptoms using cognitive techniques and *behaviors* [14]. CBT has characteristics that thoughts, feelings, behaviors, and physiologically interact [16]. Cognitive gives meaning to a situation that forms thoughts, beliefs, interpretations of the situation. Behavior is influential in maintaining or altering an individual's psychological state. By changing behavior, often thoughts and emotions about something will also change. CBT can be applied to various psychological problems, including stress caused by stroke patients and their coping strategies [17].

Based on the characteristics of the intervention given, research subjects can recognize *Negative Automatic Thoughts* (NATs) and their effects. After the Research Subjects recognized their NATs, the Research Subjects were invited to evaluate and modify NATs, identify *core beliefs*, influencing feelings and behaviors that can support the goals of intervention can be achieved.

In the session I, the research subjects was given information about CBT. In this session, research subjects learn about the relationship between thoughts, feelings, behavior, and physiology. Research subjects know that negative thoughts about post-stroke conditions cause negative feelings and the behavior they do is also less likely to support health and post-stroke activities. The Research Subject states that when thinking positively has a positive impact on the Research Subject as well.

In session II, Research Subjects identified their NATs. In this session, the Research Subject realizes that negative thoughts cause negative emotions/feelings and negative behavior such as lazy activities. The research subjects had a desire to recover from a stroke. Research subjects can find facts that contradict the expected NATs by finding facts that are contrary to NATs. Research subjects can change their thoughts to be more positive and follow reality after finding facts that can oppose the NATs. Research Subjects admit that changing negative thoughts into positive thoughts is not easy because the research subjects believe these negative thoughts to be real. However, the research subjects tried to change their negative thoughts.

In session III, Research Subjects identify *core beliefs* regarding post-stroke conditions. By identifying *core beliefs*, Research Subjects understand that what they believe (*core belief* which is believed) is not necessarily true and can cause the Research Subject to have negative thoughts so that it impacts negative feelings towards post-stroke conditions. After knowing *core beliefs*, the research subject chose to think positively.

In session IV, research subjects were invited to identify their feelings because feelings can also influence thoughts and behavior according to the characteristics of the CBT intervention. By being aware of the feelings/emotions experienced after a stroke, Research Subjects can motivate themselves to behave that supports health. The research subject stated that he wanted to change

negative feelings into positive feelings to change the negative thoughts that accompanied previous negative feelings.

Based on the description, it can be concluded that qualitatively there is a decrease in the degree of depression in post-stroke patients, which is marked by a change in thinking. So, it can change feelings and behaviors that initially do not support health to be more positive. This is in line with changes in behavior in research subjects who previously were not motivated to carry out daily activities. Because they felt they had limitations due to stroke, they became confident and believed that research subjects could do activities even with their current limitations. In addition, Research Subjects are also able to manage negative feelings that affect post-stroke conditions by changing these negative feelings into positive feelings and accepting the reality that exists. So, negative thoughts (NATs) and *core belief* which during post-stroke is believed to be reduced or avoided by looking at the facts against NATs and *core belief* the. This can be seen after the second and third sessions [18].

After receiving the CBT intervention, the Research Subjects believed that thoughts, feelings and behavior influenced each other. The relationship between thoughts, feelings and behavior greatly influences research subjects in dealing with post-stroke conditions. Negative thoughts (NATs and *core belief* inappropriate) causing the Research Subject to experience feelings of sadness, disappointment and anger with the post-stroke condition. So, the Research Subject chose not to carry out daily activities and drowned in a state of despair that had an impact on post-stroke depression [19]–[23]. After knowing that the Research Subject can overcome post-stroke depression by thinking positively, the Research Subject tries to maintain positive thinking about post-stroke conditions that can accelerate or help the post-stroke recovery process.

5. Conclusions

CBT intervention given to patients with post-stroke depression is able to have a good effect on reducing depression in post-stroke ischemic patients. Health services that provide care services for patients with post-ischemic stroke depression are advised to provide CBT interventions to patients to reduce post-ischemic stroke deepest scores.

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