

Effectiveness of Group Cognitive Behavioral Therapy for Decreasing Pain Intensity in Osteoarthritis Patients

Ike Astuti Dany Rosani, Irmawati, Joesetta M. R. Tuapattinaja

Faculty of Psychology, University of Sumatera Utara, Indonesia

Abstract— This study aims to examine the effectiveness of group cognitive behavioral therapy to reduce pain intensity in osteoarthritis patients. The research design used was a quasi-experimental one group pre-test post-test design. The sampling method used was purposive sample. The subjects of this study consisted of fifteen people with osteoarthritis who met the criteria. The cognitive behavioral group module therapy used includes the application of cognitive restructuring and coping skills (diaphragm breathing and activity scheduling). Therapy sessions are given four times in two weeks. Quantitative data is taken from numerical rating scales and subject worksheets. The quantitative data collected was analyzed by the Wilcoxon nonparametric statistical test. The results showed a decrease in pain intensity score in osteoarthritis patients after being given the group cognitive behavioral therapy ($p = 0.001$; $p < 0.01$; $Z = -3.446$) and had an effect size of 79.166%. Based on the results of statistical analysis shows that group cognitive behavioral therapy effective to reduce pain intensity in patients with osteoarthritis and the effect size of the group cognitive behavioral therapy in reducing pain intensity in osteoarthritis patients is high.

Keywords— Pain Intensity, Group Cognitive Behavioral Therapy, Osteoarthritis.

I. INTRODUCTION

Osteoarthritis (OA) is a long-term chronic disease characterized by worsening of cartilage in the joints which causes bones to rub against each other and cause stiffness, pain, and movement disorders. This disease most often attacks joints in the knees, hands, feet and spine and is relatively common in the shoulder and hip joints.¹ In 2000, OA was considered to be the sixth-leading cause of years of living with disability at a global level, accounting for 3% of the total global years of living with a disability.² Osteoarthritis is the most common form of arthritis and a leading cause of disability worldwide.³ The typical clinical symptom of this disease is pain, especially after prolonged activity and weight restraint while stiffness is experienced after inactivity.⁴

The International Association for the Study of Pain defines pain as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.”⁵ It is a complex subjective phenomenon, with each individual having a unique perception of it, influenced by biological, psychological and social factors.⁶ Unlike many other pain conditions in which the underlying injury typically heals or resolves, OA is a disease that does not resolve. Thus, OA is typically accompanied by chronic pain.³ Gate control theory explains that there is a

relationship between physiological and psychological aspects in the mechanism of pain. According to gate control theory, the central nervous system acts as a physiological basis for the role of psychological factors in pain experience. Inside the spinal cord, sensory inputs are modified by the neural mechanism of the dorsal horn, this part acts as an unreal gate that inhibits or facilitates the transmission of nerve impulses from peripheral locations to the brain. In the process of inhibiting signal injury, this process closes the gate, thereby reducing pain, on the contrary, in the process of facilitating transmission, this process opens the gate, thereby increasing the intensity of pain.^{7,8} The thoughts and beliefs associated with chronic pain have received considerable attention in chronic pain research. For example, the frequency of catastrophizing cognitions (i.e., thoughts reflecting an exaggerated threat from or negative consequences of pain) has been shown to be associated with higher levels of pain intensity and dysfunction in numerous pain populations.^{9,10,11,12} Negative, inappropriate, catastrophic thoughts (irrational thoughts) are often present in patients with pain disorders. Such thoughts are highly correlated to the intensity of pain complaints.¹³

Cognitive Behavioral Therapy (CBT) is a psychosocial therapeutic method in which behavior change is initiated by the therapist by helping patients to confront and change their irrational thoughts, which are most likely the cause of maladaptive behavior.¹⁴ Cognitive-behavioral therapy focuses on restructuring this negative cognitive schema into a more realistic appraisal of the patient’s current condition. When a realistic perspective regarding the past, present, and future can be gained, patients may be able to more easily deal with their pain.¹⁵ After the patient has successfully reconstructed his mind, then the patient is given coping skills in managing pain, which includes deep breathing relaxation training and activity scheduling.

Relaxation training is often a component of cognitive behavioral therapy for pain patients. Deep breathing is a relaxation technique that focuses on slow, patterned abdominal breathing. Patients are taught to breathe slowly and deeply, allowing their abdomen to expand. As patients inhale deeply, their abdomen should rise and their diaphragm should move downward. As inhalation continues, the lower part of the chest expands and eventually the upper part of the chest does so as well. When the breath is completed, it is held for several seconds and then slowly exhaled. After exhalation is

completed, patients pause for a second or two and then repeat the cycle. Deep breathing techniques are often utilized to help patients with anxiety disorders as well.¹⁵

Another coping skill that involves the practical application of skills that permit better coping with day-to-day pain is activity scheduling. Finding an appropriate level of activity is important. When patients try to do too much on days that their pain is relatively good, they often find themselves nearly immobilized the following day. Other patients may restrict movement too much for fear of worsening their pain. Prolonged inactivity can lead to further problems with mobility and pain. Activity should be encouraged, but in a restrained manner that is not likely to exacerbate the pain. Patients should be taught to monitor their pain during activity and to stop activity before pain becomes severe. Frequent rest periods may be helpful in allowing activity to continue without significant exacerbation of pain and may lead to increased functioning. Concrete, attainable goals should be set to enable patients to slowly become more active.^{15,16}

II. OBJECTIVES AND METHOD

The objective of this research is to examine the effectiveness of group cognitive behavioral therapy to reduce pain intensity in osteoarthritis patients. The research design used was a quasi-experimental one group pre-test post-test design. The sampling method used was purposive sample. The subjects of this study consisted of fifteen people with osteoarthritis who met the criteria. The cognitive behavioral group module therapy used includes the application of cognitive restructuring and coping skills (diaphragm breathing and activity scheduling). Therapy sessions are given four times in two weeks. Quantitative data is taken from numerical rating scales and subject worksheets. The quantitative data collected was analyzed by the Wilcoxon nonparametric statistical test.

III. RESULT AND DISCUSSION

The research hypothesis is group cognitive behavioral therapy effective therapy to reduce pain intensity in osteoarthritis patients. This is evident through the Wilcoxon test analysis the pretest score and posttest score obtained scores $Z = -3.446$ and scores $p = 0.01$ so that $p < 0.05$, it can be concluded that there is a significant difference between pretest and posttest in the study participants after being given the CBT group. This means that after being given the CBT group the participants experienced a decrease in pain intensity. This shows that the CBT group is effective in reducing pain intensity in people with osteoarthritis. Effect size group cognitive behavioral therapy in reducing pain intensity in patients with osteoarthritis in this study was 79.166%, which means that the cognitive behavioral group therapy has a relatively high effect in reducing pain intensity in people with osteoarthritis.

The large effect size is influenced by the success of the implementation of cognitive restructuring and coping skills in research participants in managing the pain. On the application of cognitive restructuring data obtained that participants in this study as a whole had irrational thoughts related to pain

experienced before applying cognitive restructuring. Irrational thoughts are dominated by, among other things, "I am useless", "I am disabled", "I am helpless", and "I am failing." After participants apply cognitive restructuring related to pain experienced a change of mind from an irrational mind turns into a rational mind. This shows that all participants experience changes in their mind from irrational ones to be rational after applying cognitive restructuring. The rational mind possessed by the participants is dominated by the thought "No need to be afraid", "I am capable", "I am not a failure", "Pain is a natural thing."

After the participant changes his mind from irrational to rational then the participant must recognize the coping used so far before getting therapy. The results of identification of coping in participants before getting therapy showed that all participants had inappropriate coping, among others, by avoiding activities and carrying out activities beyond their abilities. Participants who had coping avoided the activity of overcoming pain by as much as 40% (6 people) and participants who had more than 60% of physical abilities (9 people). This shows that the dominance of coping that participants have is that they tend to engage in physical activity beyond their ability to deal with pain. After knowing the coping that has been used so far, coping skills are given which include respiratory diaphragm and activity scheduling in managing the pain. In the diaphragmatic breathing exercise, data were obtained that before diaphragmatic breathing as a whole the participants felt relaxed did not relate to the condition of the pain felt. After the participants carried out diaphragmatic breathing changes in all participants relaxed. This shows that participants in diaphragmatic breathing exercises succeed in changing conditions that do not relax when the pain relaxes. This is in line with the results of the systematic review conducted by Kwekkeboom and Gretarsdottir (2006). It was found that relaxation exercises had a significant impact on the reduction in pain intensity suffered by individuals.

In accordance with the principles of cognitive behavior therapy in handling pain where after a change of mind from an irrational mind becomes rational, adaptive behavior will emerge and there will be a decrease in pain intensity. In this study adaptive behavior can be seen from the successful application of coping skills to participants. There was a change in behavior from the participants before doing activity scheduling exercises that did not balance the activity time and the time to rest in their daily lives. The participants changed to change the activity schedule by balancing between their activities and rest periods. This was followed by an increase in the ability to walk the participants in the statistical test where the ability to walk for six minutes before and after therapy got a significance of 0,000 which means that there were significant changes in the participants' walking ability after receiving therapy. This was also followed by changes in 90% of participants in the moderate pain category to be mild and 10% did not change in categories but changes in scores occurred.

The form of group intervention also seems to influence the effectiveness of giving this treatment. Based on a review of 32

experimental studies comparing individual and group therapies, it was found that group therapy was more effective than individual therapy in 25 percent of the studies. In 75 percent of other studies, no significant differences were found between group and individual therapies (Yalom & Lescz, 2005), according to Yalom and Lescz, because group therapy has several benefits not found in individual therapy. These advantages include the existence of social learning among participants in the group, the formation of social support (social support) between participants and the increase in social networks that are owned by the formation of this therapy group.

IV. CONCLUSION

Base on analysis above, we can conclude that group cognitive behavioral therapy significantly effective decreasing pain intensity in osteoarthritis patients. There was a decrease in pain intensity in osteoarthritis patients after getting the CBT group intervention. This can be seen from the results of the Wilcoxon test, the pretest score and posttest score obtained by the score $Z = -3.446$ and the score $p = 0.01$ so that $p < 0.05$. Based on the Wilcoxon test analysis it was found that there was a significant difference between the pretest and posttest in the study participants after being given the CBT group. This means that after being given the CBT group the participants experienced a decrease in pain intensity.

REFERENCES

- [1] Haq I, Murphy E, Dacre J. Osteoarthritis. *Postgrad Med J*, 2003, 79:377–383.
- [2] Symmons D, Mathers C, Pflieger B: Global burden of osteoarthritis in the year 2000 www.who.int/entity/healthinfo/statistics/bod_osteoarthritis.pdf
- [3] Tuhina Neogi, MD, PhD, FRCPC. The Epidemiology and Impact of Pain in Osteoarthritis. *Osteoarthritis Cartilage*. 2013 September ; 21(9): 1145–1153.
- [4] Dicesare PE, Abramson SB. Pathogenesis of osteoarthritis. In :Harris ED, Budd RC, Genovese MC et al (editors) .*Kelley’s Textbook of Rheumatology*, volume II, 7th edition, Elsevier Saunders. 2005 .pp.1493-1513.
- [5] IASP Task Force on Taxonomy. *Classification of Chronic Pain*. 2. Seattle: IASP Press; 1994.
- [6] Institute of Medicine. *Relieving pain in America: A blueprint for transforming prevention, cure, education and researech*. Washington, DC: The National Academies Press; 2011.
- [7] Melzack, R. 2009. Pain and Stress : Clues toward understanding chronic pain. *Psychology: IUPsyS Global Resource*.
- [8] Golden, B.A. & Barbera, L.S. 2005. Biopsychosocial Treatment of Pain. Dalam Freeman, A. *Encyclopedia of Cognitive Behavior Therapy*, hal 74-76. New York: Springer Science+Business Media, inc.
- [9] Osborne, T. L., Jensen, M. P., Ehde, D. M., Hanley, M. A., & Kraft, G. (2007). Psychosocial factors associated with pain intensity, pain-related interference, and psychological functioning in persons with multiple sclerosis and pain. *Pain*, 127, 52– 62.
- [10] Raichle, K. A., Hanley, M., Jensen, M. P., & Cardenas, D. D. (2007). Cognitions, coping, and social environment predict adjustment to pain in spinal cord injury. *Journal of Pain*, 8, 718 –729.
- [11] Turner, J. A., Jensen, M. P., & Romano, J. M. (2000). Do beliefs, coping, and catastrophizing independently predict functioning in patients with chronic pain? *Pain*, 85, 115–125. doi:S0304-3959(99)00259-6[pii]
- [12] Turner, J. A., Jensen, M. P., Warm, C. A., & Cardenas, D. D. (2002). Catastrophizing is associated with pain intensity, psychological distress, and pain-related disability among individuals with chronic pain after spinal cord injury. *Pain*, 98, 127–134. doi:S0304395902000453[pii]
- [13] Affleck G, Urrows S, Tennen H, Higgins P. Daily coping with pain from rheumatoid arthritis: patterns and correlates. *Pain* 1992;51:221–9.
- [14] Beck JS. In Session with Judith S Beck, PhD: Cognitive-Behavioral Therapy. *Primary Psychiatry*. 2006; 13:31–4.
- [15] Douglas songer MD. *Psychotherapeutic Approaches in the Treatment of Pain*. Psychiatry 2005.
- [16] Barkin RL, Lubenow TR, Bruehl S. Management of chronic pain.Part II. *Dis Mon* 1996;42:457–507.