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Effect Of Combined Cognitive Behavioural Therapy and Dhikr Therapy on Depression And Glycaemic Control Among Patients with Type II Diabetes Mellitus: A Quasi-Experimental Study in Bulukumba, Indonesia

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ABSTRACT

Background: Depression is a common comorbidity in Diabetes Mellitus (DM) and is associated with poor glycaemic control. Although pharmacotherapy can reduce depressive symptoms, nearly half of DM patients remain severely depressed, highlighting the need for effective non-pharmacological interventions. Cognitive Behavioural Therapy (CBT) combined with dhikr therapy offers a potential approach that integrates psychological and spiritual healing. **Objective:** This study aimed to determine the effect of CBT combined with dhikr therapy on depression levels and glycaemic control among Type II DM patients. **Methods:** A quasi-experimental pretest–posttest control group design was conducted over four weeks at Tanete and Bontobangun Health Centres, Bulukumba Regency, Indonesia. Eighty-four Type II DM patients with depression were recruited through purposive sampling, comprising 44 participants in the intervention group and 40 in the control group. The intervention group received structured CBT sessions integrated with dhikr once weekly for four weeks, while the control group received standard care. Depression levels were measured using the DASS-21 instrument, and blood glucose levels were assessed with a glucometer. Data were analyzed using the Wilcoxon test in SPSS. **Results:** CBT combined with dhikr therapy significantly reduced depression scores and blood glucose levels in the intervention group ($p < 0.05$), whereas the control group showed no significant changes. **Conclusion:** The integration of CBT and dhikr therapy effectively improves psychological well-being and glycaemic control in Type II DM patients. This combined therapy provides an evidence-based, non-pharmacological approach that supports holistic diabetes management. Further studies should explore optimal duration and frequency for sustained outcomes.

Keywords: CBT plus dhikr; Behavioural therapy; Therapy on Depression; Glycaemic control

INTRODUCTION

The ongoing surge in the prevalence of diabetes mellitus (DM) and its associated complications represents a significant global health concern. The International Diabetes

Federation (IDF) projects that by 2035, approximately 592 million individuals (or 1 in 10 people worldwide) will be affected by DM. Furthermore, the IDF indicates that 90% of DM cases will be classified as type 2 DM, with the majority of these cases concentrated in Asia (Zheng et al., 2018). South Sulawesi Province is currently ranked seventh in terms of the prevalence of DM, with an estimated 33,693 individuals affected. The aforementioned data substantiates the assertion that the prevalence of diabetes represents a significant public health concern. The data from the Bulukumba Health Office Profile for 2021 indicates that there are 80,788 individuals diagnosed with DM, with the highest prevalence observed in Makassar City (18,305 cases) and Bone Regency (7,445 cases). Conversely, the lowest number of cases was reported in Barru Regency (881 cases) and Selayar Regency (927 cases).

One of the most significant challenges for individuals with diabetes is the development of complications associated with the disease. These complications can include coronary artery and peripheral vascular disease, stroke, diabetic neuropathy, amputation, kidney failure, and blindness. These complications often result in increased disability, reduced life expectancy, and significant healthcare costs for individuals with diabetes and for society at large. Among the psychological disorders most commonly experienced by adults with diabetes are those related to diabetes-related depression (DRD) and depressive disorders (Chew et al., 2016).

The estimated prevalence of DRD in Europe and the United States is between 15% and 20%. Depression experienced by people with DM is associated with poor glycaemic control and decreased adherence to treatment programs. Depression has also been linked to an elevated risk of diabetic complications, particularly cardiovascular disease and retinopathy. Reducing the prevalence of depression can enhance glycaemic control and mitigate the likelihood of complications. Pharmacotherapy for depression is generally well-tolerated; however, 50% of diabetic patients remain severely depressed. Consequently, it is advised to integrate non-pharmacological approaches for depression management, such as psychotherapy, although this strategy has not been widely adopted (Chew et al., 2016; Watts et al., 2013).

One form of non-pharmacological treatment for depression is CBT. Cognitive behavioural therapy has been demonstrated to be an efficacious intervention for depression, facilitating changes in depressive thinking and mindset. However, further advances in CBT are necessary to enhance treatment outcomes. Prior studies have

investigated the efficacy of CBT in treating depression, yielding promising results.

CBT in conjunction with dhikr therapy represents a potential avenue for treatment. Individuals diagnosed with DM who experience depression tend to exhibit heightened activity in the hypothalamic-pituitary-adrenocorticotropic (HPA) gland, a physiological indicator of depression. This phenomenon, known as hypercortisolism, impairs insulin secretion and stimulates gluconeogenesis, leading to elevated blood glucose levels (Taylor et al., 2006). The provision of dhikr therapy affects the work of the brain, stabilizing the cerebellar cortex and thereby impacting the ability to reduce depression (Gufron et al., 2019). Furthermore, dhikr has been demonstrated to normalize the function of sympathetic nerves and regulate heart rate (Kurniawan, 2024). In accordance with Prayitno (2015), dhikr has the capacity to tranquilize the heart, mitigate stress and depression, and induce a state of calm and tranquillity, thereby reducing cortisol levels. Pupuh (2013) observed a reduction in cortisol levels following dhikr therapy in patients with leprosy.

In light of the aforementioned background, the objectives of this study are to identify the characteristics of diabetes mellitus (DM) patients who experience depression in Bulukumba Regency, to analyze the effect of cognitive behavioural therapy (CBT) combined with dhikr therapy on the management of depression among individuals with DM, and to examine the impact of this combined therapy on glycaemic control, particularly blood sugar levels, in DM patients within the same region.

MATERIALS AND METHODS

This study employed a true experimental research design using a pre-test and post-test control group design to evaluate the effect of cognitive behavioural therapy (CBT) combined with dhikr therapy on depression and glycaemic control among patients with type II diabetes mellitus (DM). The research was conducted in Bulukumba Regency, South Sulawesi, Indonesia. The intervention group was recruited from Tanete Health Centre, while the control group was selected from Bontobangun Health Centre.

A total of 84 respondents participated in the study, consisting of 44 individuals in the intervention group and 40 in the control group. The purposive sampling technique was used to select participants based on the following inclusion criteria: a) provided informed consent, b) diagnosed with type II DM and experiencing depression, c) identified as Muslim. Exclusion criteria included DM patients with decreased consciousness or hearing loss. Dropout criteria encompassed failure to complete all

intervention procedures, voluntary withdrawal, or death during the study period.

Data were collected using a structured research questionnaire. Depression symptoms were assessed using the Depression, Anxiety, and Stress Scale (DASS 21) developed by Lovibond & Lovibond (1995). This instrument classifies depression into five levels: normal (0–9), mild (10–13), moderate (14–20), severe (21–27), and extremely severe (28+). The validity of DASS 21 has been widely established in various populations, including those with chronic diseases, and shows strong construct and convergent validity. In this study, validity testing was conducted through expert judgment and item-total correlation, all items showing correlation coefficients > 0.30. The reliability of the DASS 21 instrument in this study was measured using Cronbach's alpha, yielding a coefficient of 0.87, indicating high internal consistency. To assess glycaemic control, blood sugar levels were measured using a digital blood glucose meter, calibrated according to standard operating procedures.

The intervention group received cognitive behavioural therapy (CBT) combined with dhikr therapy, delivered in structured sessions once a week for four consecutive weeks. Each session integrated cognitive restructuring techniques with guided dhikr practices aimed at reducing depressive symptoms and improving emotional and spiritual well-being. Meanwhile, the control group received standard care without any additional therapeutic sessions.

Data were analyzed using SPSS software. Descriptive analysis was used to present the frequency distribution and proportion of respondent characteristics and research variables. Bivariate analysis was conducted using the Wilcoxon test to determine the effect of the intervention on depression levels and blood sugar levels pre- and post-intervention. Ethical approval was obtained from Research Ethics Approval Number 002500/KEP Stikes Panrita Husada Bulukumba/2024, and participants provided informed consent.

RESULTS

Table 1 provides a summary of the baseline characteristics of the study participants. The majority of patients in the intervention group were in the advanced age category (60-74 years), comprising 52.3% of the total. The majority of these patients were female (90.9%) and had a short-term duration of diabetes mellitus (1-5 years), representing 72.7% of the group. In the control group, 75% of DM patients were in the middle age category (45-59 years), with the majority of female gender (77.5%) and 80%

had short-term DM duration (1-5 years). The baseline characteristics were comparable between the intervention and control groups, as evidenced by the homogeneity value, thus ensuring a balanced distribution between groups.

Table 1. Frequency distribution of characteristics of respondents with Type II DM in the intervention group and control group

Respondents' characteristics	Intervention		Control		Homogeneity (sig.)*
	Frequency	%	Frequency	%	
Age					
Middle age (45-59 years)	19	43,2	30	75	0.132
elderly (60-74 years)	23	52,3	8	20	
old age (75-90 years)	2	4,5	2	5	
Gender					
Male	4	9,1	9	22,5	0.092
Female	40	90,9	31	77,5	
Duration of DM					
Newly diagnosed (<1 year)	4	9,1	-	-	0.338
short-term (1-5 years)	32	72,7	32	80	
Medium-term (6-10 years)	5	11,4	7	17,5	
Long-term (>10 years)	3	6,8	1	2,5	
Total	44	100	40	100	

*Levene's homogeneity test based on median; homogeny if sig>0.05

Table 2 illustrates that the majority of patients with Type 2 DM in the pre-test intervention group exhibited moderate depression, with 30 individuals (68.2%) falling within this category. Following the intervention, the majority of patients remained in the moderate range, with 24 individuals (54.5%) continuing to display symptoms of moderate depression. However, an increase was observed in the number of patients classified as mildly depressed, with 15 individuals (34.1%) exhibiting this level of depression. In the control group, the pre-test indicated a moderate majority (25 individuals, 62.5%), which persisted in the post-test, indicating no change in the depression scale.

Table 2. The distribution of the pre- and post-test depression scales was conducted in the intervention group and control group

Depression scales	Group			
	Intervention (n=44)		Control (n=40)	
	Pre-test	Post-test	Pre-test	Post-test
Normal (0-9)	1 (2.3%)	1 (2.3%)	1 (2.5%)	1 (2.5%)
Mild (10-13)	1 (2.3%)	15 (34.1%)	4 (10%)	4 (10%)
Moderate (14-20)	30 (68.2%)	24 (54.5%)	25 (62.5%)	25 (62.5%)
Severe (21-27)	9 (20.5%)	4 (9.1%)	10 (25%)	10 (25%)
Extreme 28+	3 (6.8%)	0 (0%)	0 (0%)	0 (0%)

Table 3 illustrates the blood sugar levels of Type 2 DM patients in the intervention group prior to cognitive behavioural therapy, which ranged from 121 to 571 mg/dl with an average blood sugar level of 229 mg/dl. Following therapy, the average blood sugar level decreased to 200 mg/dl, with a range of 110 to 561 mg/dl. For the control group, the mean pre-test blood sugar was 240 mg/dL with a range of 134–478, while the post-test blood sugar was 229 mg/dL with a range of 129–399. As illustrated in Figure 1 below, the median value indicates a decrease in blood sugar from pre- to post-test for both the intervention and control groups.

Table 3. The distribution of pre- and post-test non-fasting glucose levels in the intervention and control groups.

Glucose, Blood (Non-fasting) (mg/dl)	Group			
	Intervention (n=44)		Intervention (n=44)	
	Pre-test	Pre-test	Pre-test	Pre-test
Mean±SD	229.7±97.0	200.9±87.6	240.5±84.4	229.7±77.4
Median	192	170	216	224
Minimum-maximum	121 - 571	110 - 561	134 - 478	129 - 399

The primary outcome of the study was provision of cognitive behavioural therapy combined with dhikr therapy proved to be effective in reducing the depression scale and blood glucose levels of patients with DM.

Table 4 shows the difference in depression scale, which in the intervention group showed a significant difference in depression scale before and after intervention ($p<0.05$). This is supported by the distribution of pre-post changes in depression scale, where most of the DM patients (24 people; 54.5%) experienced a decrease in depression scale after the provision of cognitive behavioural therapy combined with dhikr therapy. For the control group, there was no difference in depression scale from pre- to post-test measurement ($p>0.05$) and all DM patients had a sedentary depression scale from pre- to post-test (40 people; 100%).

Table 4. Analysis of differences in depression control before and after cognitive behavioural therapy combined with dhikr therapy.

Group	Pre-post change in depression scale score	Frequency (%)	*p-value**
Intervention (n=44)	Negative ranks	24 (54.5%)	<0.001
	Positive ranks	0 (0%)	
	Ties	20 (45.5%)	
Control (n=40)	Negative ranks	0 (0%)	1.000
	Positive ranks	0 (0%)	
	Ties	40 (100%)	

*Wilcoxon test

Table 5 shows the results of statistical tests, for the intervention group there is a

significant difference in blood glucose levels before and after the intervention ($p<0.05$). This is supported by the distribution of changes in pre-post blood glucose levels, which shows that all the DM patients (40 people; 100%) experienced a decrease in blood glucose levels after the provision of Cognitive Behavioural Therapy combined with Dhikr therapy, so it can be interpreted that the Cognitive Behavioural Therapy intervention combined with Dhikr therapy has an effect on reducing blood glucose levels in DM patients. For the control group, there was also a significant difference in blood glucose levels before and after the test ($p<0.05$). This is supported by the distribution of changes in pre-post blood glucose levels, where the majority of people with DM (28 people; 70%) experienced a decrease in blood glucose levels even though no treatment was given. However, there were also 12 people (30%) who experienced an increase in blood glucose.

Table 5. Analysis of differences in blood glucose levels before and after cognitive behaviour therapy in combination with dhikr therapy.

Group	Pre-post change in blood glucose levels	Frequency (%)	*p-value**
Intervention (n=44)	Negative ranks	44 (100%)	<0.001
	Positive ranks	0 (0%)	
	Ties	0 (0%)	
Control (n=40)	Negative ranks	28 (70%)	0.013
	Positive ranks	12 (30%)	
	Ties	0 (0%)	

*Wilcoxon test

DISCUSSION

Interpretation of Key Findings

In this study, our findings revealed that the administration of cognitive behavioural therapy combined with dhikr therapy had an effect on reducing the depression scale and blood sugar levels of patients with DM. The observation of the decrease in depression scale and blood sugar in the intervention group showed evidence of the success of CBT plus dhikr therapy.

These results are consistent with previous studies found by Yang *et al.,* (2020) showing that CBT-based interventions are effective for improving glycaemic control and depressive symptoms in patients with type 1 DM or type 2 DM with moderate to large effect sizes and support the idea that CBT can effectively help type 1 diabetes patients with comorbid depression achieve and maintain better glycaemic outcomes (2008). Notably, our study contributes to the existing evidence base with the uniqueness of adding spiritual therapy i.e. dhikr and focusing on type 2 DM patients.

Comparison with Previous Studies

Comparison of our results with those of previous studies is essential for contextualisation. The findings of Abbas et al. (2023) are consistent with our findings that cognitive behavioural therapy is an effective and promising intervention for depressive symptoms, diabetes distress and anxiety, which also helps diabetes patients to improve quality of life, medication adherence and physical activity. However, the discrepancy with Uchendu & Blake (2017) needs to be considered, as they found different results in that cognitive behavioural therapy improved depression scores in type 1 and type 2 diabetes patients after 12 months of follow-up.

CBT is effective in treating depression and improving medication adherence in people with diabetes, as CBT is an evidence-based treatment for depression comorbid with diabetes (Bukhsh et al., 2018). CBT been demonstrated to be an effective intervention for the treatment of diabetes-related conditions. This includes the reduction of emotional problems, improvement of adherence to treatment plans, and facilitation of glucose control through compliance (Ciharova et al., 2021; Pan et al., 2020; 2020).

CBT is an intervention that helps patients by providing psychoeducation, developing a deeper understanding and enhancing motivation to address and manage negative automatic thoughts, regulate emotions and improve negative beliefs (Li et al., 2017; Zakhour et al., 2020). Our findings indicate that CBT is an effective intervention for reducing psychological distress and improving emotional and behavioural outcomes, as well as treatment adherence (Tunsuchart et al., 2020). The significant difference between the initial assessment scores and the outcomes in the experimental group suggests that CBT is an evidence-based treatment for reducing diabetes-related stress and depressive symptoms among patients with type 2 diabetes (Zakhour et al., 2020).
The case study conducted by Jannah & Pohan (2022) revealed that the dhikr therapy involved focusing and calming the mind, followed by reciting the sentence of dhikr. This was performed for approximately 15 minutes.

After the therapy was administered for three consecutive days, twice a day in the morning and evening, it was demonstrated that the average reduction in blood glucose levels in both study subjects following the intervention of dhikr therapy for three days was 12 mg/dL. In accordance with the findings of Ernawati et al. (2019), it can be concluded that dhikr ma'tsurat has a notable impact on reducing blood sugar levels in

patients with type 2 DM in hospital settings. A number of studies have demonstrated that spiritual practices such as dhikr and prayer engender positive emotions, which in turn facilitate a reduction in blood sugar levels. Consequently, it has been demonstrated that such practices assist in the reduction of stress levels by activating the function of parasympathetic nerves, thereby inhibiting the production of stress hormones and facilitating the release of endorphins, which elicit a relaxation response and contribute to a reduction in blood glucose levels (Pasiak, 2012).

Implications for Public Health

The implications of our study extend to the field of public health with an impact on non-pharmacological practices to control depression and blood sugar in DM patients. For example, the observed improvement of CBT plus dhikr in reducing depression control and optimising blood sugar suggests a potential intervention to improve the quality of life of DM patients.

Limitations and Cautions

Despite the significant contributions, our study has some limitations that need to be acknowledged, such as the uncontrolled timing, duration and frequency of therapy, which may have influenced the effect of our findings. Future research should address these limitations to further refine our understanding of the specific procedures for optimal delivery of CBT plus dhikr therapy.

Recommendations for Future Research

Based on the findings of this study, future research should focus on further investigating the optimal timing, duration and frequency of therapy administration. Addressing the limitations identified in this study, such as specific and measurable delivery methods based on timing, duration and frequency of therapy, will contribute to a more comprehensive understanding of specific non-pharmacological therapy delivery procedures. In addition, exploration of confounding variables may reveal new dimensions and nuances beyond the scope of our study.

CONCLUSIONS

In conclusion, this study describes the outcomes of cognitive behavioural therapy with dhikr and provides valuable insights into its effects on depression control and blood sugar control. The comprehensive analysis of our results in the context of existing literature contributes to knowledge in international health. Our findings have implications for non-pharmacological interventions for people with DM, and future

research efforts should build on this foundation to further advance our understanding of optimal therapies.

This study recommends: For educational institutions, it is hoped that this study can be used as reading material in the library to initiate readers to use CBT plus dhikr therapy to improve the quality of life of DM patients. For those who wish to conduct similar research, to observe more specifically in relation to the optimal time, duration and frequency in providing therapy, so that more quality research can be realised for the advancement of the nursing world.

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