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Enhancing quality of life in diabetes mellitus patients through rational emotive behavior therapy: A randomized controlled trial

Rosdiana[1*], Shofiyah[2], Ester Karosekali[3], Rilla Sovitriana[4], Asmadi Alsa[5]
[1,2,3]Doctoral Program in Psychology, Faculty of Psychology, Persada University of Indonesia; Rosdiana.2166290018@upi-yai.ac.id (R.)
[4,5]Faculty of Psychology, Persada University of Indonesia.

Abstract: Diabetes Mellitus, a chronic metabolic disease, is linked with psychological suffering alongside a surplus of distress, as well as reduced quality of life (QoL), which in turn self-perpetuates a diabolical interaction between life and these two elements. However, diabetes disorder remains highly understudied, especially in the application of psychologically-based non-pharmacological programs such as Rational Emotive Behavior Therapy (REBT). This randomized pretest-posttest controlled trial was conducted to assess the period effect of REBT on improving QoL in 10 patients from UPT Klinik Kesehatan Universitas Sriwijaya, Indonesia. Participants were divided into two groups: experimental (n=5), who received 10 weekly treatment sessions of REBT focusing on cognitive restructuring and emotional regulation, and a control group (n=5) who continued to receive standard care. QoL was assessed with the Diabetes Quality of Life Clinical Trial Questionnaire (DQLCTQ; Cronbach's α =0.82) validated for use in Indonesia. The Wilcoxon Signed-Rank Test showed that statistically significant improvement in QoL occurred in the experimental group (p=0.005). In the reframed group, average scores improved from 43 (low QoL) to 60 (high QoL), while the control group placidly varied from 47 to 49, thus showcasing their negligible change. Anxiety was effectively reduced; emotional resilience and adaptive coping were effectively promoted by REBT. Those outcomes justify the need for REBT as part of interdisciplinary diabetes care, as well as any other integrated therapy to launch a wider scale trial with larger populations and longitudinal studies to claim real benefits for patients with diabetes mellitus.

Keywords: *Diabetes mellitus, Mental health, Psychological well-being, Quality of life, Randomised controlled trial, Rational emotive behaviour therapy.*

1. Introduction

Diabetes mellitus (DM) is a chronic metabolic disease characterised by the abnormal elevation of blood sugar levels, leading to dysfunction of various body systems such as the eyes, kidneys, nerves, and even the heart [1]. DM affects more than 347 million people. Within the next 10 years, this number is expected to increase by more than 50% [1]. In Indonesia, as in many other developing countries, the combination of limited healthcare resources and inadequate disease management leads to a substantial surge in diabetes cases, which ultimately contributes to a declining quality of life (QoL) [2].

The quality of life (QoL) of patients suffering from diabetes (DM) remains unacceptably low, as noted multidimensionally by medical specialists, psychologists, and sociologists. Health professionals seem to agree that diabetes mellitus (DM) patients with poor self-care behaviours, such as lack of blood glucose testing, poor dieting, and physical inactivity, tend to show higher levels of distress, non-participation, and risk of developing further health issues [3, 4]. In addition, there is evidence that stress, negative self-appraisal of the disease, and insufficient coping styles worsen the patients' condition

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* Correspondence: Rosdiana.2166290018@upi-yai.ac.id

[5, 6]. On the other hand, patients who cope with DM, who take their medications in a timely fashion, and who show some adaptive personality traits are at a greater chance of enjoying better QoL as shown by their physiological and psychological health [7, 8].

In explaining the psychological aspects of Diabetes Mellitus (DM), some studies emphasise the use of rational emotive behaviour therapy (REBT) as being helpful in the patients' adherence and emotional self-care [9, 10]. Like most modern psychotherapies, REBT assumes that maladaptive behaviours and negative emotional reactions frequently result from some irrational belief about one's condition. If such beliefs are reframed, then more adaptive coping strategies are likely to follow [10]. Despite being designed initially for a wide range of emotional and behavioural problems, there is growing evidence for applying REBT's more structured interventions, particularly the emphasis on cognitive restructuring and behaviour modification, in the context of chronic illnesses. However, their use remains limited in DM management [5, 6].

Against this backdrop, this study attempts to assess if REBT improves the QoL of DM patients attending the UPT Clinic of Sriwijaya University. This particular study aims to (1) determine the impact of REBT on irrational beliefs coping with DM, (2) assess the patients' QoL indicators prior to and subsequent to the REBT sessions, and (3) develop recommendations to supplement and augment the psychosocial aspects of treatment of DM. Using a true experimental design with a pretest-posttest control group design, it is expected that patients who receive the REBT will have greater improvement in emotional regulation, treatment adherence, and overall quality of life compared to patients who do not receive the treatment. In the end, this research hopes to present data that would aid in drawing designs incorporating the psychological aspect within the management of DM and provide benefits to health practitioners, policymakers, and the patients.

2. Methods

2.1. Research Design

This study utilised a multiple baseline across subjects design as described by Baer, et al. [11] with an integrated true experiment component consisting of a pretest-posttest control group design [11]. The multiple baseline cross-subjects design allowed the researcher to implement baseline and intervention measurements across five subjects with similar characteristics (age, gender, and intellectual level) to maximise internal validity. Each subject was placed in an A-B-A-B design. In this design, baseline phases are established prior to implementing REBT interventions, and changes are evaluated over time. At the same time, the true experimental pretest-posttest control group design minimised confounding variables by splitting participants randomly into an experimental group who received REBT and a control group who did not receive any treatment.

2.2. Identification of Research Variables

There were two major variables in this research study. The independent variable was the application of Rational Emotion Behaviour Therapy (REBT) as a therapeutic intervention for the experimental group patients and the dependent variable was the quality of life of diabetes mellitus patients. The quality-of-life measures were collected before and after the REBT intervention to assess the effectiveness of REBT on the participants.

2.3. Research Location and Duration

The Location of the Study: The study was conducted at the Health Clinic Unit of Sriwijaya University located in Indralaya, Ogan Ilir. It was carried out from December 10, 2019, to February 8, 2020, allowing for a reasonable period for pre-test and post-test assessments, psychological evaluations, REBT sessions, and post-intervention assessments.

2.4. Population and Sample

The sample population included all the outpatient diabetic patients who attended the Health Clinic Unit. A total of ten participants were selected through purposive sampling, aged below 60 years with a low or moderate quality of life score, average IQ, and no prior exposure to cognitive or relaxation therapies. Thereafter, the participants

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were randomly assigned into two groups: five individuals were assigned to the experimental group (EG); they were to receive REBT. The remaining five were assigned to the control group (CG) where no REBT was administered.

E. Intervention

Toward the end of the session, participants in the experimental group were assigned weekly home tasks planned to strengthen compliance with medication intake, routine physical exercise, diabetes dietetics, blood sugar self-monitoring, and relaxation exercises for effective stress management for four consecutive weeks of the Rational Emotive Behavior Therapy (REBT) intervention. Participants were instructed to track their adherence along with any difficulties experienced while completing the tasks, which was then addressed in therapy sessions to explore any emotional or behavioral barriers that needed further modification. Participants' progress, adherence, and the impact of REBT on psychological barriers to self-management during the care were evaluated by the researchers on a weekly basis.

On the other hand, ihe interview instructions included specific questions pertaining to the patient's and family member's views and experiences of dealing with diabetes mellitus and its management aspects. In the case of the patient, the questions included some such as illness duration for the case, family history of diabetes, treatment compliance, reported number of days medications are taken within the month, activity levels, emotional and psychological factors, medical advice given, monthly health checkups, eating habits, and family structure and support. The family's perspective incorporated questions about the patient's diabetes case history, treatment plan compliance, medication compliance, workout patterns, dietary control, blood sugar test frequency, behavioral changes noticed pre and post psychological treatment, and family involvement and support to the patient.

The relaxation training procedure implemented in this study was the deep muscle relaxation technique which focuses on relaxing the different muscles of the body in order to achieve emotional and physical relaxation. Participants began with basic activities of fist and hand tension release along with breathing control exercises. During the sessions, they learned to voluntarily tighten all the muscles of a body part, hold that position briefly (approximately five seconds), and relax while letting warm, relaxed sensations permeate the muscles. The comprehension and implementation of this method facilitated the ability of the participants to cope with their anxiety, stress, and any other emotional tension.

2.5. Techniques for Data Collection

Information was acquired using several techniques including psychological testing, interviews, observations, and review of documentation. Psychological testing included the Standard Progressive Matrices (SPM) for assessing intellectual level [12] and the Sixteen Personality Factor (16PF) for personality assessment [13]. Interview sessions were preceded first with autoanamnesis (self-reporting) and then alloanamnesis (family member reporting). Physical appearance, emotional reaction, and manner of speech of each subject were noted during observational assessment across the baseline and intervention periods. Furthermore, documentation procedures included checking the medical and background files of the subjects in the clinic.

2.6. Research Instruments

The leading measurement instrument regarding quality of life such as in their diabetes clinical trial is the Diabetes Quality of Life Clinical Trial Questionnaire (DQLCTQ) that was designed by the United Kingdom Prospective Diabetes Study (UKPDS) Participants of the study were asked to complete a questionnaire consisting of eight domains, which are: physical function, energy, health distress, mental health, personal satisfaction, treatment satisfaction, the extent of treatment, and symptoms frequency. Shen, et al. [14] reported that Cronbach's alphas for this measurement range from 0.77 to 0.99 and Hartati [15] also validated the Indonesian version with a 0.82 [15]. The scoring system in this measurement has the lowest score of 0 (lower quality of life) and 100 (higher quality of life). Arikunto [16] highlighted that based on the ideal mean (Mi) of 50 and ideal standard deviation (SDi) of 5 respondents' results can be categorised as low (<45), moderate (45-55), or high (>55).

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2.7. Data Analysis Method

The analysis of the data needed to be combined with the descriptive and statistical calculations. Descriptive statistics for DQLCTQ, interviews, and observation data are presented in summary form. The processing of the data above was done by coding, editing, entering, and cleaning the data and was finally tabulated. The Wilcoxon Signed Rank Test was used for inferential statistics and is most appropriate for this paired data set. Analysis was conducted with SPSS version 22.0 and hypotheses were accepted where p value was less than 0.05, implying difference.

2.8. Assessment

Results To evaluate the emotional state of the patients, psychological tests were conducted before implementing the intervention. The participants experienced problems including emotional blunting, neglectful eating patterns, and partial adherence to glucose checking. In addition, the analysis of the SPM test results demonstrated that the majority of the participants had intellectual functioning at an average level. Furthermore, DQLCTQ scores revealed that the participants in the intervention group had a poorer quality of life in the pre-intervention stage (mean score: 43) in comparison with the control group (mean score: 47), which was considered moderate.

2.9. Evaluation Procedure

Researcher involvement in the project evaluation started at the planning stage, which required careful preparation, and ended after the intervention had been applied. Once the researcher received permission from the clinic's management, the researcher took the pretest DQLCTQ, conducted interviews, psychological tests, and observations as baseline measurements. The experimental group then underwent Rational Emotive Behaviour Therapy (REBT) in ten sessions that were spaced out over the course of a month, and during that time, their progress was tracked with weekly check-ins for compliance and improvement. At the conclusion of the intervention phase, the patients' posttest DQLCTQ results were taken to evaluate the change in their quality of life, and the control group was measured at the same time, but they had not received any psychological treatment. Quantitative data were analysed using Wilcoxon Signed-Rank Tests, while qualitative data collected during the interviews and observations were triangulated to explore the effectiveness of REBT in improving the quality of life of patients diagnosed with diabetes mellitus.

3. Results

3.1. Intervention

Intervention for the Rational Emotive Behavior Therapy (REBT) included assigning homework weekly for 4 weeks to aid compliance with medication, physical exercises, dietary restrictions, self-monitoring of blood glucose levels, and relaxation techniques for effective stress management. Participants had to report daily compliance and describe any difficulties that arose with successful task performance. These difficulties were analyzed in therapy sessions to determine emotional or behavioral obstacles and inform future therapeutic interventions. Researchers also professionally assessed how much progress the participants were making regarding self-management throughout the study period and the effectiveness of the REBT in addressing the psychological limitations to self-management and reporting.

3.2. Hypothesis Testing

The research data obtained from the pre-test and post-test scores of the DQLCTQ Scale in the experimental group (KE) and the control group (KK) were analyzed using the Wilcoxon signed-rank test, a non-parametric statistical method. The pre-test and post-test scores for both groups are presented in Table 1.

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Table 1.
DQLCTQ scale scores for pre-test and post-test in the experimental and control groups.

Group	Pre-test Score	Post-test Score
Experimental (KE) - Subject 1	45	58
Experimental (KE) - Subject 2	35	61
Experimental (KE) - Subject 3	41	57
Experimental (KE) - Subject 4	48	60
Experimental (KE) - Subject 5	47	65
Control (KK) - Subject 1	54	55
Control (KK) - Subject 2	50	51
Control (KK) - Subject 3	43	49
Control (KK) - Subject 4	47	47
Control (KK) - Subject 5	41	44

The sample data derived from the qualitative and quantitative data collection tools for the experimental group and control group was analysed using the Wilcoxon Signed Rank Test, which falls under the nonparametric statistical approach. The collected data is presented in Table 4.3, which illustrates the pre-test and post-test scores for both groups. The control group achieved the following pre-test scores: 54, 50, 43, 47, 41 with post-test scores of 55, 51, 49, 47, 44. On the other hand, the experimental group pre-test scores of 45, 35, 41, 48, and 47 improved to post-test scores of 58, 61, 57, 60, and 65. These findings suggest that the experimental group's improvement in the quality of life after receiving an intervention was significant.
The results of the Wilcoxon test are displayed in Table 2.

Table 2.
Wilcoxon signed-rank test results.

Ranks	N	Mean Rank	Sum of Ranks
Negative Ranks	0	0.00	0.00
Positive Ranks	10	5.50	55.00
Ties	0	-	-
Total	10	-	-
Test Statistics			Value
Z			-2.803
Asymp. Sig. (2-tailed)			0.005

The study is based on the premise that "*Rational Emotive Behaviour Therapy (REBT) affects the quality of life of diabetes mellitus patients at UPT. Klinik Kesehatan Universitas Sriwijaya.*" The Wilcoxon Signed Rank Test was employed to assess whether there were statistically significant differences between mean pre-test and post-test scores. In deciding whether to accept or reject the null hypothesis (H_0), the criterion which is utilised is the Asymp. Sig value. If the Asymp. Sig probability value is lower than 0.05 then H_0 is rejected and the preferred hypothesis (H_a) is accepted which means there is a difference. On the other hand, if the Asymp. Sig value is beyond 0.05 then H_0 is accepted and H_a is rejected.

The results from the Wilcoxon Signed Rank Test are illustrated in Table 2, which shows that negative ranks are zero. This means that no subject within the experimental group suffered a drop in quality-of-life scores. Positive ranks, on the other hand, demonstrate that all ten subjects improved in the post-test compared to the pre-test, with a computed average rank of 5.50 summing up to a total rank of 55.00. Furthermore, there are no ties, suggesting no subject scored the same mark in both the pre-test and post-test assessments.

The hypothesis testing results show an Asymp. Sig (two-tailed) of 0.005 which is less than 0.05. Therefore, it confirms the null hypothesis (H_0) is rest and the alternative hypothesis (H_a) is accepted. Thus, it can be stated that the application of Rational Emotive Behaviour Therapy (REBT) enhances the quality of life of diabetes mellitus patients attending UPT. Klinik Kesehatan Universitas Sriwijaya. These results support the great impact of REBT in intervening change and confirm the use of non-parametric statistical analysis with the Wilcoxon Signed Rank Test as an effective approach.

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3.3. Pattern Matching

This analysis focused on comparing theoretical references with field case study findings pertaining to the quality of life of diabetes mellitus patients prior to the intervention. The goal was to reconcile the identified psychological symptoms with the expected theoretical symptoms. The expected symptoms are compared with the actual conditions observed in the subjects before the intervention in Table 3.

Table 3.
Pattern Matching: Theory vs. Case Findings.

Confidence Symptoms	Based on Theory	Based on Cases
Laziness	✓	✓
Anxiety	✓	✓
Tension	✓	✓
Emotional Instability	✓	✓
Hopelessness	✓	✓
Irrational Thinking	✓	✓
Hesitation	✓	✓
Doubtfulness	✓	✓

The analysis identifies chronic symptoms of confidence head syndrome in patients suffering from diabetes mellitus as: activity laziness, anxiety, emotional tension, depression, irrational thinking, hesitation, and indecisiveness. The results obtained from inquiry suggest that all subjects were suffering from these symptoms prior to the intervention. In particular, all subjects tended to feel lazy and anxious as well as be tense. In addition, all subjects were emotionally unstable and exhibited mood swings that were difficult to control.

Moreover, the findings suggest that every participant faced despair, which fits the concept of suffering from a chronic medical condition. This feeling of despair was often accompanied by irrational and catastrophic thinking about the subject's health issues. This indecisiveness and withdrawal from action reflects the considerable suffering of these patients as they had to deal with making important decisions regarding their treatment or lifestyle changes without feeling certain about anything.

The outcomes of the pattern matching analysis check all the subject's symptoms and find that they conform to the theory. The remaining value even verifies the claim that these psychological symptoms have diabetes mellitus as their underlying disease in almost all of the cases. This proves the necessity to apply psychological assistance, which is Rational Emotive Behavior Therapy (REBT), aimed at coping with these problems in order to enhance the patient's quality of life and overall wellbeing.

3.4. Intervention Outcome Development

To assess the development of behavioral improvement after the intervention, the progress of subjects in achieving desired behavioral outcomes was evaluated, as shown in Table 4.

Table 4.
Intervention Progress in Achieving Target Behavior.

Target Behavior	Intervention Process	Expected Outcome
Laziness	Subject 1, 2, 3, 4, 5 improved	Active & diligent
Anxiety	Subject 1, 2, 3, 4, 5 improved	Calm & confident
Tension	Subject 1, 2, 3, 4, 5 improved	Relaxed
Emotional Instability	Subject 1, 2, 3, 4, 5 improved	Emotionally stable
Hopelessness	Subject 1, 2, 3, 4, 5 improved	Optimistic
Irrational Thinking	Subject 1, 2, 3, 4, 5 improved	Rational thinking
Hesitation	Subject 1, 2, 3, 4, 5 improved	Certain & decisive
Doubtfulness	Subject 1, 2, 3, 4, 5 improved	Confident

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This analysis was performed to evaluate the effectiveness of the intervention in relation to the behavioural changes expected of the five subjects. The intervention's goal was to modify certain behavioural aspects such as overcoming laziness, anxiety, tension, emotional instability, despair, illogical thinking, hypersensitivity, and procrastination. The behavioural changes observed after the intervention was initiated give a picture of how effective it was.

Subject 1 was more active, and physical functioning was best in session five. There was a calm feeling in session five, which was attributed to high energy levels. By session six, the subject started relaxing because their health condition improved. By session six, emotional stability was noticeable because the barriers to mental health were non-existent. Life appreciation was noticed in session six, and by session eight, there was a feeling of satisfaction with the treatment received. Treatment effect was confirmed in session seven, and confidence was noted in session seven as no new symptoms were noted.

By session five, subject 2 showed positive progression as they became more productive owing to better physical functioning. In session six, with adequate energy balance, calmness was achieved. Emotional stability was noted in session five and there was also evidence of relaxation around this time, with no mental health disruptions. The subject began displaying some degree of optimism by session eight, as well as becoming more satisfied with the treatment they received in that particular session. Evidence of treatment effects was noted in session five and confidence was reported in session five due to the absence of new symptoms.

Subject 3 proved to be the most improved in this round as they displayed marked progress and increased productivity in session seven due to better physical functioning. Calmness was reported in session eight and this was due to sufficient energy. Relaxation and eased tension levels were recorded around session seven, especially when a stabilized health condition was noted. Emotional stability was reported in session seven and there was no evidence of deterioration in mental health. Optimism was reported in session nine as well as continued satisfaction with the treatment from session six. Eased treatment effects were noted in session eight and confidence due to lack of new symptom reporting was noted in session eight.

By the fifth session, subject 4 was more diligent because of improved physical functioning. Calmness was noted during session seven, with relaxation achieved in session eight. Emotional stability was noted in session nine, as there were no mental health barriers reported. Life optimism was noted in session nine with satisfaction towards treatment noted in session eight. Treatment effectiveness was noted to be sure by session six with confidence being built in session six due to no additional symptoms presenting.

Subject 5 also demonstrated progress with them being more diligent by session seven due to ease of physical functioning. However, achieving calm was not accomplished by the last session. Relaxation was achieved in session eight, alignment with health stability. Emotional stability was noted in session nine as there were no mental health disruptions. Optimism and satisfaction with treatment was noted in session ten. Treatment effectiveness along with confidence due to absence of new symptoms was recorded in session nine.

In a broader scope, the intervention had a favourable outcome on behavioural changes in all five subjects, which validates its effectiveness in enhancing the subjects' psychological and emotional wellbeing. The overall effect stresses the need for continuous intervention aimed at combating the mental and emotional problems of patients suffering from diabetes mellitus.

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3.5. Comparison of Pre-test and Post-test Results in Experimental and Control Groups

This analysis was conducted to support data interpretation regarding the changes observed between pre-test and post-test results using the DQLCTQ questionnaire among diabetes mellitus patients. The findings indicate significant differences between the experimental group (KE) and the control group (KK), emphasizing the impact of the intervention.

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Table 5.
DQLCTQ Scale Scores Before and After Intervention in the Experimental Group (KE).

Subject	Pre-Test Score	Post-Test Score
Subject 1	45	58
Subject 2	35	61
Subject 3	41	57
Subject 4	48	60
Subject 5	47	65
Average	43 (Low Quality of Life)	60 (High Quality of Life)

Table 6.
DQLCTQ Scale Scores Before and After Intervention in the Control Group (KK).

Subject	Pre-Test Score	Post-Test Score
Subject 1	54	55
Subject 2	50	51
Subject 3	43	49
Subject 4	47	47
Subject 5	41	44
Average	47 (Moderate Quality of Life)	49 (Moderate Quality of Life)

As previously stated, the experimental group displayed noteworthy changes in all five subjects post-intervention. In the pretest, Subject 1 scored 45 and increased to 58 in the post-test. Similarly, Subject 2's score improved from 35 to 61, and Subject 3 demonstrated an increase from 41 to 57. Subject 4 progressed from 48 to 60, and Subject 5's score increased from 47 to 65. The average pre-test score for this group was 43, indicating low quality of life. However, after the intervention, the average post-test score increased to 60, reflecting high quality of life. These outcomes indicate that the intervention, Rational Emotive Behaviour Therapy (REBT), is crucial in improving the subjects' psychological well-being and quality of living.

Unlike the experimental group, the control group's results did not change significantly. Subject 1's score showed marginal gains, going from 54 to 55. Subject 2 also only moved slightly from 50 to 51. Subjects 3 and 4 made slightly larger strides, with Subject 3 going from 43 to 49 and Subject 4 remaining at 47. Subject 5 made the smallest improvement as he went from 41 to 44. The pre-test average for the control group stood at 47, suggestive of a moderate level of life satisfaction. With the post-test average moving up to 49, the control group still remained at a moderate level of life satisfaction. These overall results show that, without any help, diabetes mellitus patients did not have significantly different measures of quality of life over a given period.

The experimental and control group results showcase the effectiveness REBT has in the treatment of diabetes mellitus patients. While the experimental group showed enhancement in their post-test scores, the control group showed no change, affirming the fact that the intervention positively reinforced psychological and emotional issues.

4. Discussion

4.1. The Impact of Rational Emotive Behaviour Therapy (REBT) in Relation to Quality of Life Enhancement Among Diabetes Mellitus Patients

This study concludes that Rational Emotive Behaviour Therapy (REBT) is highly significant in improving the quality of life of Diabetes Mellitus patients at UPT. Klinik Kesehatan Universitas Sriwijaya. The Wilcoxon Signed Rank Test indicated a p-value of 0.005; since this is lower than 0.05, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accepted. This acknowledges that the REBT intervention "made a significant difference" to the patients' psychological well-being and quality of life.

This conclusion is also substantiated by a comparison of pre-test and post-test scores. In the experimental group, the average pre-test score was 43 while the post-test average increased to 60, which is classified under high quality of life. In contrast, the control group that did not undergo REBT intervention has only a little change from

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an average pre-test score of 47 to a post-test score of 49, both of which are categorised under moderate quality of life.

This study adds to the literature by demonstrating the utility of REBT on the overall well-being of patients with Diabetes Mellitus by psychologically managing distress variables and helping patients to make positive adjustments. The changes measured statistically and observed in terms of behaviour affirm that there is an intervention effect in regard to the patients' outcomes.

The results of the study reveal the noteworthy contribution of Rational Emotive Behaviour Therapy (REBT) in improving the life of Diabetes Mellitus patients at UPT. Klinik Kesehatan Universitas Sriwijaya. The outcome is in accordance with other literature proving the psychological advantages of utilising REBT as a therapeutic modality. In Okeke, et al. [17] it is underscored that REBT-based religious coping intervention had a positive effect on the mental health of patients suffering from Type 2 Diabetes Mellitus by alleviating psychological distress and promoting emotional balance Okeke, et al. [17]. Fitri [18] also noted the impact of REBT on increasing the coping skills and reducing the anxiety, which is one of the prerequisites in dealing with the emotional burden of chronic diseases like diabetes. All these findings add to the evidence that REBT can act as an essential psychological intervention aimed at changing irrational beliefs, improving emotions, and consequently, the quality of life of diabetes patients [18].

In addition, while this study supports the effectiveness of REBT in enhancing psychological well-being, it is important to integrate such results within other psychological intervention strategies. Abroshan, et al. [19] suggest that Acceptance and Commitment Therapy (ACT) could be more effective in self-care activities of diabetes patients rather than REBT. This points out the need to consider multi-modal approaches which combine several psychological therapies for more effective management of diabetes. Along the same lines, Masriadi, et al. [20] reported that diabetics sociodemographic and behavioural factors are important determinants of their quality of life. This indicates that therapies such as REBT need to be flexible to address specific patient sociodemographic and psychosocial factors to achieve optimal therapeutic outcomes [20].

The study also builds on psychological well-being by linking it to the unemotional, structured cognitive behavioural techniques that a patient would use to control his diabetes by modifying his behaviour to self-help and better emotional self-regulation. The use of REBT in diabetes care may be the missing element in the interface of mental health and chronic disease management because it allows patients to reframe their unhelpful thinking, employ reasoned coping strategies, and despite the burden of the disease, achieve a positive quality of life.

Considering these results, further studies should focus on the impact of REBT in managing diabetes over a longer duration in order to assess if the sustained psychological benefits translate into improved treatment compliance and general physical health, along with better treatment outcomes in diabetes and glycaemic control. At the same time, combining REBT with other therapeutic modalities, such as mindfulness techniques or ACT, may create a more holistic model of care for patients with diabetes. Furthermore, there is a need to examine the influence of different cultures and religions as possible moderators of the impact of REBT, based on what previous research suggests that customised approaches which take participants' beliefs and sociocultural backgrounds tend to be more useful.

Even so, this research adds to the already existing literature that recognises the value of REBT as an intervention for patients with diabetes. It is a well-known fact that REBT improves the psychological well-being of patients; however, further studies are needed regarding the strategy, the interplay with other methodologies, and the impact on various patient populations to ensure success.

4.2. The Results of the Implementation of Rational Emotive Behaviour Therapy (REBT) In Improving the Quality of Life Of Diabetes Mellitus Patients"

The execution of the REBT was in two steps; one was pattern matching and the other was behaviour change measurement, where focus was paid to the degree of emotional balance, anxiety, rational activity, and self-esteem or confidence.

The initial assessment showed that all five subjects in the experimental group tended to manifest signs of low motivation that include laziness, anxiety, tension, emotional instability, hopelessness, irrational thought process,

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indecisiveness and procrastination. These symptoms are in line with expectations of a hypothesised solution of patients having low psychological resilience because of living long term with a chronic illness.

After the session, all participants in the study showed improvement which is marked by increased levels of motivation (becoming more diligent), less anxiety (feeling calmer), increased emotional stability (fewer fluctuations of moods), and improved optimism toward health (being more hopeful and confident). These changes were observed to be gradual throughout the 10 intervention sessions, but major shifts were noticed between the fifth and ninth sessions.

An analysis of the pre-test and post-test scores confirmed these changes in behaviour. The experimental group moved from the low to high quality of life category, while the control group stayed within the moderate quality of life category. This difference reinforces, once more, the impact of REBT in promoting emotional resilience and adaptive coping skills among patients suffering from Diabetes Mellitus.

The study applied Rational Emotive Behaviour Therapy (REBT) following a matching and measuring approach that focused on emotional balance, anxiety, and self-confidence rational activity. The pre-test assessment indicated that all five subjects belonging to the experimental group had psychological symptoms of low motivation and emotional distress such as apathy, anxiety, emotional outbursts, hopelessness, disorganised thinking, indecisiveness, and procrastination. This confirms the assumption that people with chronic conditions like Diabetes Mellitus tend to have low psychological resilience which adversely affects their ability to deal with the difficulties of everyday life.

After conducting the intervention using REBT, all subjects belonging to the experimental group were found to have improved remarkably in multiple psychological dimensions. Motivation increased noticeably and subjects were more diligent in carrying out daily activities. Anxiety was significantly diminished, as indicated by the calmness of their demeanour. Emotional stability was also observed to improve, with fewer mood changes and better control of emotion. In addition, patients became more optimistic about their health and demonstrated greater confidence in self-managing the condition. The changes in behaviour were noted step by step during the ten sessions of the intervention with the most dramatic changes occurring between the fifth and ninth sessions.

A statistical comparison of pre-test and post-test scores consolidated these observations. The experimental group changed from a low quality of life to a high quality, while the control group stayed at a moderate quality of life. This difference proves the influence of REBT in developing emotional resilience and coping skills among patients suffering from Diabetes Mellitus more powerfully.

The findings of the present study corroborate the available literature regarding the impacts of REBT on people's mental health and emotional balance. Amalia, et al. [21] researched and found that REBT was effective in increasing self-esteem and mental well-being of orphaned adolescents undergoing psychological trauma. The therapy helped in changing their irrational beliefs, which in turn raised their self-esteem and enabled them to cope more effectively. This strengthens the argument that REBT should be made accessible to emotionally unstable individuals, including those suffering from chronic diseases like Diabetes Mellitus [21].

In addition, Ndukwu, et al. [22] provide additional support for the effectiveness of REBT in anxiety and depression management during crisis periods such as the COVID-19 pandemic. Their study is illustrative of how REBT helps in the reduction of anxiety because it promotes the challenging of irrational beliefs and encourages the adoption of rational cognitive structures. This is similar to the current study's findings that REBT interventions assisted patients with Diabetes Mellitus in managing anxiety and having a positive health perspective [22].

Milutinovic, et al. [23] in their study, further emphasised that outpatients utilising REBT showed improvement in emotional balance and psychological resilience, which is consistent with the present research's results on the contribution of REBT to emotional stability and optimism among the patients with Diabetes Mellitus in the study. These patients exhibited better control over their emotions and improved psychological well-being [23].

REBT has also been credited with improvement of motivation to a greater extent beyond controlling emotions. Nur'aini, et al. [24] noted that using REBT increased students' learning motivation, which is consistent with the current study's results that noted decreased procrastination and increased motivation to undertake self-care activities and routines among patients with Diabetes Mellitus [24].

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These findings established further support for the use of REBT as a psychological intervention for the treatment of chronic illness by illustrating benefits on emotional distress, resilience, and motivation. As noted in Abroshan, et al. [19] research, there is a possibility that Acceptance and Commitment Therapy (ACT) is better at achieving self-care actions, which indicates that further research needs to be conducted on the possible combination of REBT with other psychological methods [19]. Furthermore, Masriadi, et al. [20] findings noted that sociodemographics and lifestyle factors have an impact on quality of life, which implies the need to tailor REBT approaches to the specific psychosocial needs of the patients suffering from Diabetes Mellitus.

In any case, the work above serves to enhance the evidence base for REBT as an intervention in diabetes care, but more needs to be done to analyse the full scope of REBT's impact on the diabetic patient's psychological well-being, the need to assess its long-term impact, scope for integration with other therapies, and its use in different demographic patient groups remains.

5. Conlusion

The current study proves the effectiveness of Rational Emotive Behaviour Therapy (REBT) combined with cognitive approaches in enhancing the quality of life of diabetes mellitus patients at UPT. Klinik Kesehatan Universitas Sriwijaya. The emotional and cognitive negative patterns were replaced through the intervention which improved the patients' psychological resilience, emotional stability, and motivation.

The subjects of the study, prior to the REBT intervention, showed low quality of life concerning the psychological domains of self-care, physical activity, and life stress management which was characterised by inactivity, anxious or taut emotional state, hopeless irrational cognitive behaviours, and indecisiveness. During the REBT sessions, the subjects were able to show clinically significant improvements in the behavioural and psychological changes. The high quality of life post-intervention was indicated by a series of positive actions such as lower levels of inactivity, greater levels of calmness, emotional stability, and self-confidence, alongside rational thinking and decisiveness.

The analysis provided further proof towards the incorporation of REBT as a psychological intervention in the management of chronic conditions with diabetes mellitus allowing for negative emotional and adaptive coping-altering strategies. These outcomes corroborate previous studies regarding the application of cognitive-behavioural approaches for enhancement of the mental health and life quality of a person.

Further studies should examine the long-lasting impacts of REBT, how it is combined with other interventions, and its use among various populations. Also, because of the impact sociodemographic and behavioural factors have on quality of life, the RELAX approach to REBT for Diabetes Mellitus patients should be tailored to maximise the therapeutic benefits.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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