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Research article

CBT (Cognitive Behavior Therapy) Psychoeducational Intervention on Reducing Diabetes Distress Levels In Patients With Type 2 Diabetes: A Systematic Review

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ABSTRACT

Background: Diabetes Mellitus Type 2 (T2DM) is a lifelong disease, while suffering from the disease patients will experience diabetes distress (DD) which causes negative emotions: anxiety, stress, depression. Cognitive Behavior Therapy (CBT) intervention helps patients in dealing with DD problems whose implementation does not require drug medication, in its implementation CBT has various sessions and each session has a different topic.

Methods: This study used literature review and PRISMA method from 6 electronic databases (*Cochrane Library, Ebsco Host, Proquest, PubMed, Sage Journal, Sciendirect, Scopus, Springer, Web Of Science*.) n=4541, the search was conducted to find the effectiveness of CBT in reducing the level of DD in T2DM patients. Risk of bias was assessed using the *Joanna Briggs Institute* (JBI) critical appraisal tools checklist.

Results: A total of 5 articles met the inclusion criteria of 5 articles with the Randomized Controlled Trial (RCT) method Respondents in the study were T2DM patients who were divided into 2 research groups (intervention and control). The results showed a difference in DD levels between the two groups.

Conclusion: There is a significant effect on reducing the level of DD in patients with T2DM. The advantages of CBT intervention are not using pharmacological drugs, cost-effective, and easy to use. In addition, CBT intervention has the advantage that its flexible use can be adjusted to the needs and needs of the patients.

I. Introduction

Diabetes Mellitus is a lifelong disease suffered by patients, during T2DM patients with diabetes distress (DD) problems cause negative emotions including: anxiety, stress, depression (Fisher et al., 2012; Ma & Chan, 2013), and negative self-efficacy (Petrak et al., 2015), people with T2DM with maladaptive coping mechanisms such as: not being able to deal with stressors, feeling weak, afraid, tense according to Carpenito, (2016), if left untreated will increase the risk of complications, poor therapy management (Hapunda, 2022; Nastiti, 2022), anxiety, depression (Burns et al., 2016) medication non-adherence, reduced self-care (Álvarez Palacios et al., 2017; Gonzalez et al., 2007, 2008, 2015), mortality (Hayashino et al., 2018), morbidity (Winchester et al., 2016), length of treatment (Park et al., 2013), and increase medical costs (McMorrow et al., 2021).

An overview of the world's DD patients, 36% (13,319) of T2DM patients showed moderate to severe DD. (Perrin et al., 2017). In the Central Asian continent, 48.5% (184) of patients had high DD category. (Batais et al., 2021). East Asia as many as 90.82% (98) patients, moderate to high DD category (Hu et

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al., 2020). West Asia as many as 35.6% (142) patients with moderate to severe DD (AlOtaibi et al., 2021). South Asia, 77.5% (310) had moderate to high DD (Chew et al., 2016; Hemavathi et al., 2019). Southeast Asia 76.2%, (1111) patients had moderate to high DD (G. Kalra et al., 2020). In Indonesia, out of 324 patients, 53.5% had T2DM with moderate to high DD problems. (Arifin et al., 2017).
Individuals with DM are prone to experiencing health problems including physical and mental, the common occurrence and much attention is on visible or physical problems, but little attention is paid to mental health (S. Kalra et al., 2018). CBT intervention is an intervention with a biopsychosocial approach that includes the role of brain function to influence mental activity (cognitive-constructive process) which plays a role in building core beliefs, values, and individual goals. (Yusuf & Setianto, 2013). CBT is carried out in the form of transformation of knowledge associated by the conscious mind into consolidation with the unconscious mind - which allows recall at any time if needed so that the brain can maintain the execution of one task at a time (Yusuf & Setianto, 2013). The more often a type of behavior is used, the more changes in brain anatomy and function i.e. nerves will form in the amygdala of the brain which is responsible for helping process emotions, thus increasing the likelihood of the same behavior being used again. (Šimić et al., 2021).
CBT is an intervention that explores the relationship between thoughts, emotions, and behaviors with a targeted, well-timed, and structured approach. (Beck, 2021), CBT is used to correct cognitive distortions (thinking excessively and causing psychological problems) which prioritizes cognition or thoughts, thought processes and how cognition affects emotions and behavior (Radiani, 2016), This intervention has been applied to people with T2DM with physical health problems such as obesity (Gulley et al., 2022), effective in improving glycemic control (Yang et al., 2020), mental problems such as: reduced emotional problems, DD (Tunsuchart et al., 2020), anxiety (Wroe et al., 2018), stress (Ciharova et al., 2021), dan depression (Setyaningrum et al., 2018; Yang et al., 2020).

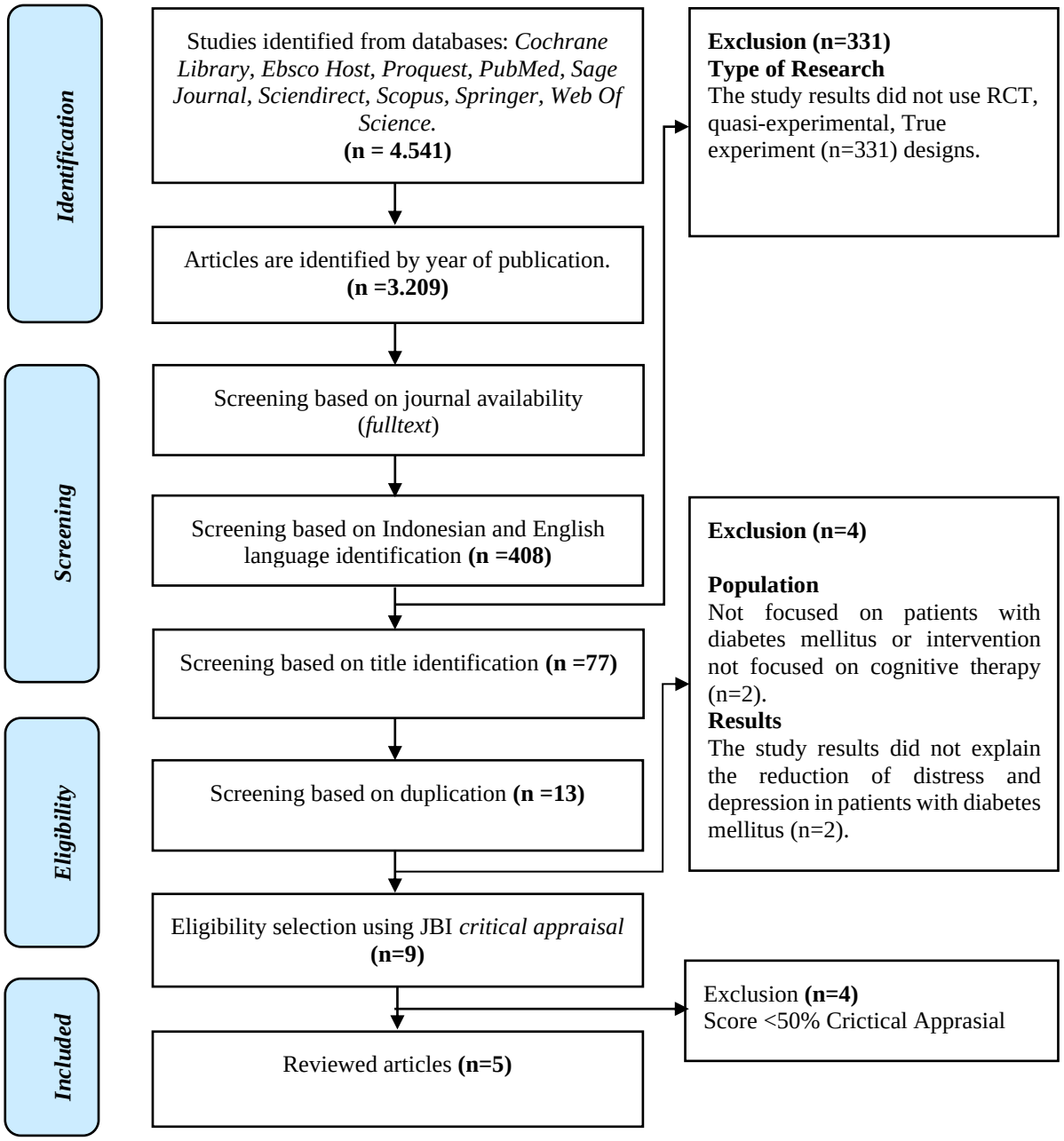
II. METHODS

Sources of information from systematic review article searches using electronic databases consisting of Cochrane Library, Ebsco Host, Proquest, PubMed, Sage Journal, Sciendirect, Scopus, Springer, Web Of Science, literature searches were conducted on May 27, April 2024. Each search was limited to A Quasi-Experimental Design, Clinical Trial, Randomized Controlled Trial, and True experiment, published in English during 2013 - 2023. The search for articles or journals used keywords and boolean operators (AND, OR NOT or AND NOT) which were used to expand or define the search, making it easier to determine the articles or journals used. The search strategy was defined as follows: "Cognitive behavior therapy" OR "CBT", AND "Diabetes Mellitus Type 2" OR "Diabetes type 2" OR "Type 2 diabetes" OR "T2DM", AND "Diabetes distress" OR "Diabetes related distress" OR "Stress" The keywords in this systematic review were adjusted to the Medical Subject Heading (MeSH) (Yu, 2018). Inclusion criteria: Studies focused on T2DM patients. Intervention: cognitive behavior therapy (CBT) psychoeducational intervention. Comparison: -. Outcome: Decreased level of diabetes distress in patients with type 2 diabetes mellitus. Study Type: A Quasi-Experimental Design, Clinical Trial, Randomized Controlled Trial, and True experiment. Publication years: 2019 - 2024 Language: Indonesian and English.

III. RESULTS

Based on the results of the study selection, the first step obtained 4541 published articles taken from the database search: Cochrane Library, Ebsco Host, Proquest, PubMed, Sage Journal, Sciendirect, Scopus, Springer, Web of Science. In step 2, articles were edited and identified by year (n=3209). Step 3 Researchers screened based on journal availability (fulltext) (n=1937) articles. Step 4 The researchers conducted screening based on language identification, namely Indonesian and English only which were included in the criteria (n = 408) articles. Step 5 researchers excluded the type of research, namely only research with RCT design, quasi experimental, true experiment (n = 331) articles. Step 6 researchers conducted title identification screening (n=77) articles obtained. Step 7 researchers screened based on duplication (n13). Step 8 researchers excluded studies based on population and results because they did not meet the requirements of focusing on patients with diabetes mellitus or interventions not focusing on cognitive therapy and study results did not explain the reduction of distress and depression in patients with diabetes mellitus (n = 2) articles. step 9 researchers selected the eligibility of articles using the JBI Crictical apprasial (n = 11) articles. step 10 researchers excluded articles because the score was less than 50% (n = 4) articles, until finally 5 articles were reviewed, the selection process can be seen in Figure 1.

Figure 1. Flowchart of Selected Articles for Systematic Review and Selection Process Using PRISMA Method.



1. Study Demographics

Study demographics can be described and categorized by: title, author, year of publication, country, and publisher.

a. By Year of Issue

The studies included in this systematic review of research articles were selected based on publications from 2019 - 2024, research articles published in 2019, namely: (Cummings et al., 2019), 2020, namely: (Lutes et al., 2020), and (Tunsuchart et al., 2020), in 2022 that is: (Koledoye et al., 2022), d an year 2023 that is : (Abbas et al., 2022).

b. Country Of Origin

When viewed by journals based on their country of origin: 1 article comes from California, namely (Cummings et al., 2019), 1 article from Canada, namely (Lutes et al., 2020), 1 article from Switzerland, namely (Tunsuchart et al., 2020), 1 article from America, namely (Koledoye et al., 2022), and 1 article from the UK, namely (Abbas et al., 2022).

c. Based on Journal Article Publisher

When viewed from journal sources there are : 1 article published from ProQuest, namely: (Abbas et al., 2022), 1 journal from Pubmed, namely: (Cummings et al., 2019), 2 journals from Scopus, namely: (Lutes et al., 2020), (Tunsuchart et al., 2020), and 1 journal from Web of Science, namely: (Koledoye et al., 2022).

Table 1. Demographic data of the article

No.	Title, Author and Year of Publication	Country	Publisher
1	*Randomized trial of a tailored cognitive behavioral intervention in type 2 diabetes with comorbid depressive and/or regimen-related distress symptoms: 12-month outcomes from COMRADE* (Cummings et al., 2019)	California	*Pubmed*
2	*A Tailored Cognitive-Behavioural Intervention Produces Comparable Reductions in Regimen-Related Distress in Adults With Type 2 Diabetes Regardless of Insulin Use: 12-Month Outcomes From the COMRADE Trial* (Lutes et al., 2020)	Canada	*Scopus*
3	*Benefits of brief group cognitive behavioral therapy in reducing diabetes-related distress and hba1c in uncontrolled type 2 diabetes mellitus patients in Thailand.* (Tunsuchart et al., 2020)	Switzerland	*Scopus*
4	*Effect of Stress Management Coaching Intervention on Adult Learners with Type 2 Diabetes: A Rational-Emotive Cognitive Behavioural Coaching Approach.* (Koledoye et al., 2022)	New York	*Web Of Science*
5	*Cognitive Behavior Therapy for Diabetes Distress, Depression, Health Anxiety, Quality of life and Treatment Adherence among patients with Type- II Diabetes Mellitus: A Randomized Control Trial.* (Abbas et al., 2022)	Inggris	*ProQuest*

2. Characteristics of Study Respondents

Respondents who are included in the inclusion criteria in the study first require the criteria as described above including: gender and age that has been determined, the research that has been carried out in the article is an experimental study where the researcher divides the respondents into 2 groups, namely the intervention group who received CBT treatment training and the control group who received conventional treatment. Respondents in this study were patients with a diagnosis of type 2 diabetes mellitus as many as 543 respondents, the characteristics of male sex ratio were 242 female 301.

a. By gender

When viewed from the gender of respondents in the study, there were more female respondents than male respondents, namely 341 (62.80%) and 242 (44.57%).

b. By Age

When viewed from age, it can be seen that the average age of respondents in the study was 47.17 years old, which can be seen in table 2 below.

Table 2. Respondent Characteristics

Characteristics	n	%
Gender		
Men	242	44.57 %
Women	341	62.80 %
Total	543	100 %
Average Age		
52.6	139	100 %
52.19	139	100 %
56.04	56	100 %
38.10	119	100 %
36.93	90	100 %
Total	543	100 %

3. Intervention Character

Characteristics of the intervention. Data collected included: number of sessions, time span of each session, time span of the intervention.

a. By Type of Research

The studies included in this systematic review consist of 1 research design, namely Randomized controlled trial as many as 5 articles, namely: (Cummings et al., 2019), (Lutes et al., 2020), (Tunsuchart et al., 2020), (Koledoye et al., 2022), and (Abbas et al., 2022).

b. By Number of Sessions

When viewed from the number of sessions implemented, there is 1 artiekl that uses 6 sessions in the implementation of CBT interventions, namely: (Tunsuchart et al., 2020), 1 article that uses 8 training sessions: (Abbas et al., 2022), 2 articles using 16 training sessions: (Cummings et al., 2019), (Lutes et al., 2020), 1 article using 20 training sessions, namely: (Koledoye et al., 2022).

c. Based on the Time Duration of Each Session

When looking at the articles obtained based on the duration of time or the time required for the implementation of the intervention for each session, there is 1 article that takes 30 - 6 minutes, namely : (Cummings et al., 2019), 1 article that requires 45-60 minutes, namely: (Abbas et al., 2022), 2 articles that require 60 minutes, namely: (Koledoye et al., 2022), (Lutes et al., 2020). And 1 article that requires 60-90 minutes, namely: (Tunsuchart et al., 2020).

d. By Intervention Time Frame

When viewed based on the time span for implementing CBT interventions, there is 1 article that requires 6 weeks for implementation, namely : (Tunsuchart et al., 2020), 1 article takes 12 weeks to implement, namely: (Koledoye et al., 2022), 1 article takes 16 weeks, namely: (Abbas et al., 2022), and 2 articles took 48 weeks to implement the intervention, namely: (Cummings et al., 2019) and (Lutes et al., 2020).

e. Based on Analysis

Based on the data analysis used, it can be seen that there are 2 articles that use ANOVA analysis to test data differences, namely: (Koledoye et al., 2022), (Abbas et al., 2022), 1 article using Student's

t-test analysis, namely: (Lutes et al., 2020), 1 article that uses the t-test, namely: (Tunsuchart et al., 2020), and 1 article that uses Intent-to-treat analyses, namely: (Cummings et al., 2019). More data can be seen in table 3. regarding the characteristics of each article's intervention.

Table 3. Intervention Characteristics

Characteristics	n	%
Study type		
Randomized control trial	7	100%
Publisher Jurnal		
ProQuest abbas	1	20%
Pubmed cumming	1	20%
Scopus lutes tunsuchart	2	40%
Web Of Science koledoye	1	20%
Number of intervention sessions		
6 tunsuchart	1	20%
8 abbas	1	20%
16 lutes, cumming	2	40%
20 koledoye	1	20%
Time duration of each session		
30-60 menit Cummings	1	20%
45-60 menit abbas	1	20%
60 menit koledoye lutes	1	40%
60-90 menit tunsuchart	1	20%
Intervention time span		
6 minggu tunsuchart	1	20%
12 minggu koledoye	1	20%
16 minggu abbas	1	20%
48 minggu cumming, lutes	2	40%
Analysis		
ANOVA koledoye abas	2	40%
Student's t test lutes	1	20%
T-test tunsuchart	1	20%
Intent-to-treat analyses cumming	1	20%

Presentation of literature results in writing a systematic review contains a summary of the results of each selected article in tabular form, identification is done by searching using electronic databases resulting in a total of 4,541 articles. Screening was carried out by conducting data review based on full text resulting in 1,937 articles, eligibility studies were carried out after the article was obtained which was then tested using critical appraisal with JBI and resulted in 5 articles, and the results of studies that met the criteria for systematic review can be seen in table 4 below:

Table 4. Characteristics of studies included in the systematic review (n=5).

No.	Title, Author and Year of Publication	DSVIA Method (Design, Subject, Variable, Instrument, Analysis)	Result
1.	*Randomized trial of a tailored cognitive behavioral intervention in type 2 diabetes with comorbid depressive and/or regimen-related distress symptoms: 12-month outcomes from COMRADE* (Cummings et al., 2019)	**Design:** *-Randomized controlled trial.* **Subject:** -139 Responden. -72 Intervention group. -67 Control Group. **Variable:** -Independen: *Cognitive behavioral intervention.* -Dependen: comorbid depressive and/or regimen-related distress symptoms patient diabetes type 2. **Instument:** - *The Diabetes Distress Scale (DDS-17).* - *Patient Health Questionnaire (PHQ-9).* **Analyze:** *-Intent-to-treat analyses.*	The results showed that CBT therapy intervention matched with lifestyle counseling improved behavioral outcomes and could improve HbA1c in rural patients with T2D and reduce depressive symptoms and/or comorbid RRD, with comparison of treatment and control groups (P = 0.001). The study was conducted over a period of 6 months, and 12 months, 16 total sessions. And 30 - 60 minutes of meeting in each session.
2.	*A Tailored Cognitive-Behavioural Intervention Produces Comparable Reductions in Regimen-Related Distress in Adults With Type 2 Diabetes Regardless of Insulin Use: 12-Month Outcomes From the COMRADE Trial* (Lutes et al., 2020)	**Design:** *-Randomized controlled trial.* **Subject:** -139 Responden. - intervention group - control group **Variable:** -Independen: *Cognitive-Behavioural Intervention Produces.* -Dependen: Reductions in Regimen-Related Distress in Adults With Type 2 Diabetes Regardless of Insulin. **Instument:** - *The Diabetes Distress Scale (DDS-17).* *-Patient Health Questionnaire (PHQ-9).* **Analyze:** *-Student's t test.*	Results from the study showed Patients in the insulin treatment group showed significantly greater reductions in regimen-related distress (RRD) and slight significant improvements in medication adherence and A1C compared to insulin users in usual care with pre-test and post-test differences (p = 0.05). The study was conducted over a period of 12 months, 16 total sessions. 60 minutes at each meeting.
3.	*Benefits of brief group cognitive behavioral therapy in reducing*	**Design:** *-Randomized controlled trial.* **Subject:**	The results of the study showed that Brief group cognitive behavioral therapy

No.	Title, Author and Year of Publication	DSVIA Method (Design, Subject, Variable, Instrument, Analysis)	Result
	diabetes-related distress and hba1c in uncontrolled type 2 diabetes mellitus patients in Thailand. (Tunsuchart et al., 2020)	-56 Responden. -28 Intervention group. -28 Control Group. **Variable:** -Independen: *Brief group cognitive behavioral therapy.* -Dependen: reducing diabetes-related distress and Hba1c in uncontrolled type 2 diabetes mellitus. **Instument:** *-The Diabetes Distress Scale (DDS-17).* **Analyze:** *-Pair t-test and independence t-test.*	(BG-CBT) had a significant effect on improving diabetes distress, improving food consumption behavior, and reducing HbA1c levels with pre-test and post-test difference values (p = 0.00). The study was conducted over a period of 6 weeks, a total of 6 sessions, 60 - 90 minutes in each meeting per week.
4.	*Effect of Stress Management Coaching Intervention on Adult Learners with Type 2 Diabetes: A Rational-Emotive Cognitive Behavioural Coaching Approach.* (Koledoye et al., 2022)	**Design:** *-Randomized controlled trial.* **Subject:** -119 Responden: -60 Intervention group. -59 Control Group. **Variable:** -Independen: *A Rational-Emotive Cognitive Behavioural Coaching.* -Dependen: Stress Management Type 2 Diabetes. **Instument:** *-Perceived Stress Scale-14 (PSS-14).* **Analyze:** -ANOVA.	Results from the study showed that adult learners who participated in the rational-emotive cognitive behavioral coaching (RE-CBC) intervention showed significantly reduced stress levels at post-test that were maintained at follow-up compared to the control group ($p < 0.05$). The study was conducted over a period of 12 weeks, 20 sessions with a duration of 60 minutes per meeting or session. At week 12 respondents were asked to attend in their entirety for evaluation and post-test.
5.	*Cognitive Behavior Therapy for Diabetes Distress, Depression, Health Anxiety, Quality of life and Treatment Adherence among patients with Type-II Diabetes Mellitus: A Randomized Control Trial.* (Abbas et al., 2022)	**Design:** *-Randomized controlled trial.* **Subject:** -90 Responden: -45 Intervention Group. -45 Control Group. **Variable:** -Independen: *Cognitive-behavioral therapy.* -Dependen: *Diabetes Distress, Depression, Health Anxiety,*	The results showed that cognitive behavioral therapy in type II diabetes mellitus patients can reduce diabetes distress F (1,60)=222.710, P<0.001, y2=788, depression, health anxiety and improve treatment adherence and quality of life. The study was conducted with a total of 8 sessions,

No.	Title, Author and Year of Publication	DSVIA Method (Design, Subject, Variable, Instrument, Analysis)	Result
		Quality of life and Treatment Adherence among patients with Type- II Diabetes Mellitus **Instument:** *- Diabetes Distress Scale (DDS-17).* *- The Patient Health Questionnaire (PHQ-9).* *- Revised Version of Diabetes Quality of Life Questionnaire (RV-DQOL).* *- The diabetes quality of life Questionnaire (RV-DQOL).* *- General Medication Adherence Scale (GMAS).* *- International Physical Activity Questionnaire (IPAQ).* **Analyze:** - ANOVA statistic.	conducted for 16 weeks, with 45 - 60 minutes per session meeting.

IV. DISCUSSION

Mental health problems in T2DM are closely related to psychological stress, namely experiencing DD (McMorrow et al., 2021; Napolion et al., 2021). Patients during T2DM with DD problems cause negative emotions including: anxiety, stress, depression (Fisher et al., 2012; Ma & Chan, 2013), and negative self-efficacy (Petrak et al., 2015). In reducing the level of DD, psychoeducational interventions such as Cognitive Behaviour Therapy (CBT) are described as useful in overcoming DM problems including reducing DD (Hermanns et al., 2015), stress and improving treatment regimens (Uchendu & Blake, 2017).

In the results of the article review, it is known that CBT intervention in reducing DD in T2DM patients is shown by a significant value after the intervention in the control group compared to the intervention group 3.2 ± 6 1.3 and 2.9 ± 6 1.2 with a difference value of p = 0.144 (Cummings et al., 2019), 3.3 ± 1.4 vs 2.8 ± 1.1 with p=0.05 (Lutes et al., 2020), 2.46 ± 0.47 vs 2.46 ± 0.41 with p=0.00 (Tunsuchart et al., 2020), 25.41 ± 3.76 vs 15.09 ± 0.81 with p=0.00 (Koledoye et al., 2022), 15.45 ± 2.93 vs 10.05 ± 2.22 with 222.710 P<0.001 (Abbas et al., 2022). This shows that there is a decrease in diabetes distress scores of T2DM patients given CBT intervention.

CBT-based interventions help patients by providing psychoeducation, developing better understanding and increasing motivation to overcome and manage negative automatic thoughts, by regulating emotions, and rectifying negative beliefs (Li et al., 2017; Zakhour et al., 2020), in addition CBT effectively reduces psychological distress and improves emotional and behavioral outcomes and treatment adherence (Tunsuchart et al., 2020). A significant difference between baseline and outcome assessment scores in the experimental group reported that CBT is an effective evidence-based treatment intervention to reduce diabetes distress and depressive symptoms in T2DM patients (Li et al., 2017). Through the medium of communication, education, transfer of thoughts, and development of understanding, it will significantly increase the patient's understanding in understanding the problem of the disease suffered, so that patients who are aware of their problems with the help of health workers will be more effective in the medication process.

Based on the results of the article review, the number of CBT sessions implemented ranged from 6 to 20 sessions (Cummings et al., 2019), (Lutes et al., 2020), (Tunsuchart et al., 2020), (Koledoye et al., 2022), (Abbas et al., 2022). The number of CBT intervention sessions may vary depending on the severity and complexity of the problem. Some patients with T2DM experience significant improvement

in four to six sessions, while others may require more than 20 sessions (Rector, 2010). According to Lincoln et al., (2016) and Rector (2010) to provide CBT for a minimum of 16 sessions and indicated that these recommendations can be generalized to clinical practice settings, and 25 sessions are appropriate. In carrying out the implementation of CBT in T2DM patients, it is readjusted to the purpose of the intervention for what is being carried out, namely reducing and reducing the problem of diabetes distress, CBT facilitates disorders that occur repeatedly, helps solve problems and develop skills to avoid problems that are felt to be recurring, in CBT sessions the implementation is carried out sequentially where each session must be qualified and ensured success in the session, if the patient does not pass in one session must repeat the next meeting, this results in an increasing number of sessions as well.

Based on the results of the review for the duration of implementation of each CBT meeting session, it is carried out in the range of 30 - 90 minutes (Cummings et al., 2019), (Lutes et al., 2020), (Tunsuchart et al., 2020), (Koledoye et al., 2022), (Abbas et al., 2022). CBT is an intervention that explores the relationship between thoughts, emotions and behavior with a directed, timely, and structured approach (Beck, 2021), CBT management strategies are divided into 2, namely cognitive restructuring and learning new behaviors (Brooks et al., 2014). This therapy is flexible in its implementation and can be carried out in a group, couple, or family format. In individual interventions, CBT is carried out for approximately 45 to 50 minutes with outpatients, therapeutic interactions can be shorter (Beck, 2021). With each session lasting about 50 minutes. The course of CBT can be longer or shorter depending on the disorder, the severity of the problem, the suitability of the patient and the therapist carrying out the intervention (Gautam et al., 2020). CBT emphasizes collaboration and active participation. It emphasizes that therapy is a form of cooperation. For example, jointly deciding what to work on in each session, deciding together on the duration of meetings, and outlining therapies that can be done independently. Therefore, the duration of the intervention is generally set to limit the length of the intervention or vice versa depending on the needs of the patient.

Based on the time span of implementation, based on the results of the review 6 to 48 weeks (Cummings et al., 2019), (Lutes et al., 2020), (Tunsuchart et al., 2020), (Koledoye et al., 2022), (Abbas et al., 2022). If CBT is recommended, you will usually have sessions with a therapist once a week or every 2 weeks, the implementation of CBT interventions can vary by 4, 6, 12 weeks or more (Safren et al., 2014). CBT is an intervention that explores the relationship between thoughts, emotions and behavior with a directed, timely, and structured approach (Beck, 2021), according to Roy and Lloyd, (2012) although in general CBT has structured sessions, the implementation can be different, depending on the needs of the individual who needs it. The implementation of the intervention can vary in time, but what needs to be considered is the component in the number of sessions in each intervention, the more sessions, materials, trainings, and tasks given to the patient, the more time it will take to complete the intervention stages.

V. CONCLUSION

CBT interventions in general can reduce and overcome various mental health problems, in T2DM patients, especially with diabetes distress, based on the results of a review of articles showing a decrease in these problems. In the implementation of the intervention, the things that need to be considered are the limitations depending on the needs of the individual and the specific conditions they experience so that it is necessary to adjust the implementation in the implementation, considering that CBT interventions take time over a period of weeks to years to see the effect of the intervention, the need for consistency and sustainability in the implementation of the intervention.

VI. LIMITATIONS

This study has limitations that are considered when interpreting the results. (1) In the study the sample size was small and conducted over a short period of time, which limits the generalizability of the results, (2) Articles that met the inclusion criteria were limited.

VII. ACKNOWLEDGMENTS

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VIII. CONFLICT

The overall summary in this systematic review research article is independent writing, so there is no conflict of interest in the writing.

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