

# Cognitive Behavior Therapy Improve Intolerance of Uncertainty in Type II Diabetes Mellitus Patients

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## ABSTRACT

Diabetes mellitus (DM) is a chronic disease and silent killer characterized by hyperglycemia. Type 2 DM has become a global health crisis. This disease causes serious life-threatening health problems with high medical costs, decreased quality of life and increased mortality which causes uncertainty where patients feel they no longer care about their disease and the solution to overcome this with Cognitive Behavioral Therapy. Quantitative research type, Quasi-Experiment design with pretest-posttest. The population amounted to 319 people, sample selection by purposive means, a sample of 36 people. The instrument used a questionnaire. The statistical test used Wilcoxon Test. The results of the Wilcoxon test value =  $0.000 < (0.005)$  means that there is an effect of cognitive behavior therapy on intolerance of uncertainty in Type II Diabetes Mellitus patients at the Amplas Health Center in 2024. Based on the results of the study, it is concluded that there is an effect of cognitive behavior therapy on intolerance of uncertainty in Type II DM patients. It is expected that DM patients with intolerance of uncertainty use non-pharmacological methods, namely cognitive behavior therapy to reduce intolerance of uncertainty.

**Keywords:** Cognitive Behavior Therapy, intolerance of uncertainty, type II diabetes mellitus

## INTRODUCTION

Diabetes is a group of metabolic diseases characterized by hyperglycemia that occurs due to abnormalities in insulin secretion, insulin action or both (PERKENI, 2022). According to the International Diabetes Federation, diabetes mellitus is one of the fastest growing global health diseases of the 21st century. Diabetes mellitus is also a cause of high mortality (IDF, 2021) and the number of DM patients worldwide will increase to 439 million by 2030. As lifestyles deteriorate, the number of DM patients may continue to increase in the future. The number of DM patients worldwide will increase to 439 million by 2030. Along with worsening lifestyles, the number of DM patients may continue to increase in the future, the percentage of people with Diabetes Mellitus in 2019 in North Sumatra was 249,519 patients and those who received health services were 144,521 patients or 57.92%. The remaining 104,998 did not seek health services. The number of people with Diabetes Mellitus in Medan is 95,420 people (Dinkes Sumut, 2019).

Type II DM patients show clinical complaints in the form of polyuria, polydipsia, polyphagia, and unexplained weight loss. Other complaints can include weakness, tingling, itching, blurred eyes, erectile dysfunction in men, and pruritus vulvae in women (Soelistijo et al., 2019). Diabetes mellitus has an impact on various conditions such as physical, psychological, social and environmental conditions. Patients feel disturbed by their diabetes and embarrassed because of the physical changes experienced by people with diabetes mellitus (Hati et al., 2021). When someone experiences complaints that lead to symptoms of diabetes and is diagnosed with diabetes mellitus, the patient will be recommended to take treatment that lasts a long time or even for life, even though DM disease cannot be cured but can still be controlled by changing lifestyle (Vina et al., 2021). Due to the long treatment time, the patient feels bored and finally the patient does not comply with the treatment so that the DM does not experience healing or even increases (Angriani et al., 2019).

Uncontrolled diabetes mellitus can cause many complications, both acute and chronic, which can reduce the quality of life of sufferers. This, if not treated and carrying out proper self-management, the worst impact of the onset of complications can lead to death (Sari et al., 2022). Due to the long treatment, patients experience anxiety which is characterized by depressed mood, loss of pleasure or interest, feelings of guilt or low self-esteem, eating or sleeping disorders, lack of energy, and low concentration. Patients with DM are more at risk of experiencing anxiety even than suffering from other chronic diseases (Sari et al., 2022). Patients feel useless and will only be a burden to others. This results in the onset of intolerance of uncertainty in patients with DM (Rengga & Stephani, 2021)

Intolerance of uncertainty (IU) is defined as a tendency to feel afraid of everyday situations that are uncertain, and interpret all ambiguity as something stressful and frustrating (Aprodita, 2021). The emergence of stressors due to uncertainty and not being overcome by appropriate coping strategies can cause patients to feel anxious. This is stated in research that shows that uncertainty is positively related to perceived anxiety. This can occur because uncertainty can lead to the belief that an uncertain future will be unfair and sad, which results in increased anxiety felt due to uncertainty (Salsabila et al., 2022). This must be treated as soon as possible with pharmacological and non-pharmacological therapies because of the adverse effects, namely the emergence of anxiety, depression, and other psychological disorders such as patients not taking their medication,

patients stopping control to health facilities, patients surrendering and even patients no longer care about their illness (Nurfadila et al., 2023)

The pharmacological interventions carried out to overcome diabetes mellitus patients with intolerance of uncertainty use drugs, but will cause various side effects. Non-pharmacological interventions are safer therapies because of the relatively low risk to sufferers, do not require expensive costs and have been proven to include aromatherapy, cognitive behavior therapy, physical exercise and meditation (Rizky & Karneli, 2022) Cognitive Behavior Therapy (CBT) to prevent relapse in depression and anxiety disorders, by reducing disease symptoms through modification of negative thoughts and behaviors by making daily activity plans and activities to be able to recognize negative thoughts and then restructure the negative thoughts (Utomo & Melli, 2020).

From the survey results at the Medan Amplas Health Center, 10 people were found to experience anxiety due to diabetes experienced for more than 5 years, feeling bored because they have to take medicine and keep food, wrong perceptions of the disease, health facilities and patients feel bored because they have to control repeated health facilities. Anxiety that causes intolerance of certainly that must be managed so that patients can still live life with controlled blood glucose levels and keep thinking positively by using Cognitive behavior therapy

Based on the exposure above, the authors are interested in examining the effect of cognitive behavior therapy on intolerance of uncertainty in patients with type II diabetes mellitus.

## **METHODS**

The research design used was a quasi experiment with one group pre test-post test design. The location of this research was conducted in the working area of the Amplas Health Center, with a population of 319 respondent. In this study, sample selection by means of nonprobability sampling, purposive sampling type (Sugiyono, 2022). Respondents were divided into 6 groups. Before the study, the researcher gave a request for research permission, explained the purpose of the study and gave informed consent.

The CBT (cognitive behavior therapy) intervention was carried out for 6 meetings with 30 minutes per meeting. The intervention consists of six stages, namely engage client, assess the problem, person and situation, prepare the client for therapy, implement the treatment program, evaluate

progress and prepare the client for termination. The instrument used was the intolerance of uncertainty questionnaire (IUS 12) which was given before and after the intervention (Simos & Nisyraiou, 2023) with a total of 12 questions and data analysis using the Wilcoxon Te with a total of 12 questions with the results of the high category: 46-60, Medium: 29-45, and Low: 12-28 and data analysis using the Wilcoxon test (Nursalam, 2020).

## RESULTS

### Demographic Data

**Table 1. Characteristics of Respondents Based on Gender, Age, Religion, Education and Duration of Type II Diabetes Mellitus**

Demographic Data	Frequency (f)	Percentage (%)
<b>Age</b>		
20-40 years (early adulthood)	9	25
40-59 years (middle adulthood)	24	66,7
60 years old (late adulthood)	3	8,3
<b>Religion</b>		
Islam	36	100
<b>Education</b>		
Not in school	0	0
Elementary school	5	13,9
Junior high school	12	33,3
High school	17	47,2
Undergraduate	2	5,6
<b>Duration of DM</b>		
1-5 Years	9	25
5-10 Years	11	30,6
>10 Years	16	44

The characteristics of respondents are seen based on the distribution of respondents according to gender, age, religion, education, and duration of diabetes. In this study, the characteristics of respondents according to gender were mostly female as many as 36 people (100%), the majority of respondents aged 40-59 years as many as 24 people (66.7%), the majority of respondents were Muslim as many as 36 people (100%), the majority of respondents had a high school education as many as 17 people (47.2%), and respondents in this study had a majority of diabetes mellitus for > 10 years as many as 16 people (44%).

**Intolerance of Certainty before Cognitive Behaviour Therapy in patients with Type II Diabetes Mellitus**

**Table 2. Distribution of Intolerance of Uncertainty Before Being Given Cognitive Behavior Therapy in Patients with Type II Diabetes Mellitus**

<b>Intolerance of Uncertainly Pre</b>	<b>Frequency (f)</b>	<b>Percentage (%)</b>
High	27	75
Medium	9	25
Low	0	0
<b>Total</b>	<b>36</b>	<b>100</b>

Based on the results of Table 2, it is known that the results before being given cognitive behavior therapy in Diabetes Mellitus patients at the Medan Amplas Health Center in 2024 obtained intolerance of uncertainty with a high category of 27 people (75%).

**Intolerance of Certainty after Cognitive Behaviour Therapy in patients with Type II Diabetes Mellitus**

**Table 3. Distribution of Intolerance Of Uncertainty After Being Given Cognitive Behavior Therapy in Patients with Type II Diabetes Mellitus**

<b>Intolerance of Uncertainly Post</b>	<b>Frequency (f)</b>	<b>Percentage (%)</b>
High	7	19,4
Medium	17	47,2
Low	12	33,3
<b>Total</b>	<b>36</b>	<b>100,0</b>

Based on Table 3, it is known that the results after cognitive behavior therapy was carried out on Diabetes Mellitus patients at Puskesmas amplas in 2024 respondents showed that the majority of intolerance of uncertainty levels were in the moderate category as many as 17 people (47.2%).

**The effect of Cognitive Behavior Therapy on Intolerance of Uncertainty in Patients With Type II Diabetes Mellitus**

**Table 4. The effect of Cognitive Behavior Therapy on Intolerance of Uncertainty In Patients with Type II Diabetes Mellitus**

<b>No.</b>	<b>Intolerance of Uncertainly</b>	<b>Mean</b>	<b>Mean</b>	<b>Z</b>	<b>P value</b>
1.	Pre	1,25	13,00	4,590	0,000
2.	Post	2,14			

Based on Table 4, it is found that the mean value before cognitive behavior therapy is 1.25 and after cognitive behavior therapy is 2.14 and the average mean value is 13.00. and a z value of 4.590 which means that there is a difference before and after cognitive behavior therapy.

The results of the Wilcoxon test  $p = 0.000 (<0.005)$  mean that there is an effect of cognitive behavior therapy on intolerance of uncertainty in Diabetes Mellitus patients in the Amplas Health Center Working Area in 2024. Thus, it can be concluded that the data for intolerance of uncertainty is valid. Which means, the treatment given has an effect on intolerance of uncertainty, namely: there is an effect of cognitive behavior therapy on intolerance of uncertainty in patients with Diabetes Mellitus in the Working Area of the Amplas Health Center in 2024.

## **DISCUSSION**

### **Intolerance of Certainty before Cognitive Behaviour Therapy in patients with Type II Diabetes Mellitus**

The results showed that before being given cognitive behavior therapy in Type II Diabetes Mellitus patients, intolerance of uncertainty was obtained with a high category of 75%, and a moderate category of 25%. The majority of respondents intolerance of uncertainty in the high category from the results of the first meeting interview the majority of respondents said they did not want to go to health facilities, were tired of undergoing treatment for a long time, and did not believe in treatment because they had undergone treatment for a long time.

Intolerance of uncertainty is influenced by several factors including length of suffering. The majority of long suffering from diabetes mellitus, namely > 10 years as many as 44%, which has the potential to increase intolerance of uncertainty. In line with Dedi's research, 2020 which states that the length of time of illness experienced results in a person thinking negatively and causing intolerance of uncertainty. A person can have an impact on his ability to deal with the problems he experiences which will ultimately affect his health status. The longer a person suffers from Diabetes Mellitus (DM) pain, the heavier the anxiety level (Cummings et al., 2019).

Anxiety is thought to be associated with difficulty tolerating doubt about future events and possible negative consequences. Worry is indeed a cognitive attempt to generate ways to prevent the occurrence of adverse events and/or prepare for them. In addition, the goal of not feeling the "full" emotion is achieved. Patients do not question their beliefs as they are happy that everything is going well (Borza, 2017). This is what happened to Type II Diabetes Mellitus patients who have experienced this disease for more than 3 years in this study.

The researcher assumes that the length of time suffering from Diabetes mellitus and experiencing anxiety is a factor in the onset of intolerance of uncertainty. The longer a person suffers from

Diabetes Mellitus, the anxiety will arise, thinking negatively about his illness and resulting in intolerance of uncertainty.

### **Intolerance of Certainty after Cognitive Behaviour Therapy in patients with Type II Diabetes Mellitus**

After carrying out cognitive behavior therapy at the Amplas health center, the researcher conducted a posttest to obtain intolerance of uncertainty with the majority in the moderate category 47.2%. This research was conducted for 6 days with 20 minutes per meeting.

On the first day the respondent thought that he would not be able to do something. The majority of respondents' answers about the intolerance of uncertainty questionnaire pre cognitive behavior therapy are: uncertainty makes me unable to live life to the fullest, when taking action uncertainty makes me helpless, when feeling unsure I cannot do something well, and a speck of doubt can stop me from taking action.

On the second day until day 5, the researcher asked about complaints that resulted in intolerance of uncertainty, the majority of respondents said that the length of treatment was the main thing that made them bored and caused uncertainty about their illness. On the third to fifth day, CBT was conducted with restructuring techniques (finding solutions together) for 20 minutes each meeting. Researchers used leaflets containing the 4 pillars of Diabetes Mellitus management and each meeting checked blood sugar levels to support the results of the study. And provide education on the importance of seeking treatment at health facilities so that Diabetes Mellitus can be treated and does not cause complications

On the sixth day preparing respondents to end cognitive behavior therapy as well as re-measuring intolerance of uncertainty and getting the results of intolerance of uncertainty with the majority of moderate categories. Marked by the majority of respondents answering the intolerance of uncertainty post cognitive behavior therapy questionnaire: I am always curious about the future that awaits me, it is a must for me to always look ahead to avoid surprises and I must be able to organize everything in advance (Salsabila et al., 2022).

The group CBT approach is used to find out various group problems, improve relationships between group members, encourage open dialogue, be able to express feelings, and encourage

mutual feedback between group members so that individuals can divert their stress by playing and gathering together with friends (Awek & Afif, 2022).

## **The effect of cognitive behavior therapy on intolerance of uncertainty in patients with Type 2 Diabetes Mellitus**

Based on research that has been done at the Medan Amplas Health Center about the effect of cognitive behavior therapy on intolerance of uncertainty in Diabetes Mellitus there is an effect of cognitive behavior therapy on intolerance of uncertainty in Diabetes Mellitus patients in the Medan Amplas Health Center Work Area in 2024.

Cognitive behavior therapy is a combination of cognitive and behavior therapy approaches. The CBT process itself is based on the conceptualization and understanding of the individual for specific beliefs of behavior patterns. The hope obtained from the CBT approach itself is to bring about a restructuring of deviant cognitive and belief systems from individuals and bring about changes both in terms of emotional and behavioral changes towards a better direction (Safitrhry, 2022)

After the intervention was given, there were several changes in the respondents, including cognitive, emotional and behavioral changes. Changes in cognition are that respondents begin to feel that their mindset is complicated and the impact is detrimental to respondents and will learn to choose things that must be prioritized and reduce negative thinking. Respondents also began to realize that when they have negative thoughts, the response they feel is also negative, both in terms of physical, feelings and behavior. The subject realized that the intolerance of uncertainty he experienced was due to negative thoughts (Semium, 2020).

The effectiveness of CBT has been confirmed helping people become aware of and change distorted, maladaptive and negative cognitions that negatively affect their behavior (Safitrhry, 2022). Cognitive restructuring techniques are proven to lead to reduced intolerance of uncertainty. Cognitive restructuring techniques help individuals systematically analyze, process, and overcome cognitive-based problems by replacing negative thoughts and interpretations with positive thoughts and interpretations. Cognitive restructuring involves applying learning principles to the mind. Some research results show the effectiveness of this technique combined with other CBT techniques (Shikantani et al., 2014).



CBT which is one of the non-pharmacological interventions is a safer therapy because of the relatively low risk to sufferers, does not require expensive costs and has been proven in addition to aromatherapy, physical exercise and meditation (Cummings et al., 2019). Non-pharmacological interventions such as cognitive behavioral therapy (CBT) have been shown to be effective for overcoming behavioral barriers related to self-care and improving glycemic control among people with diabetes.

## **CONCLUSION**

The results of research conducted in the Medan Amplas Puskesmas work area on the effect of cognitive behavior therapy on intolerance of uncertainty in type II DM patients at the Medan Amplas Puskesmas that the intolerance of uncertainty before being given cognitive behavior therapy in Diabetes patients was found to be the majority of respondents in the high category as many as 27 people (75.0%), After therapy, the majority of the moderate category was 17 people (47.2%) and there was an effect of cognitive behavior therapy on intolerance of uncertainty in Diabetes Mellitus patients using the Wilcoxon test  $p = 0.000 (<0.005)$ , it can be concluded that the hypothesis is accepted because the  $p$  value is  $<0.005$  so it can be stated that there is an effect of cognitive behavior therapy on intolerance of uncertainty in Diabetes Mellitus patients.

## **LIMITATION**

During this study, researchers experienced limitations and obstacles related to the implementation of interventions providing cognitive behavior therapy. The limitations faced by researchers are that researchers have not been able to maximally control factors that can affect intolerance of uncertainty, among others: Activity, diet, habits, genetics, spirituality, family participation in cognitive behavior therapy which turns out that the family's role is very important in the intolerance of uncertainty seeing the organ damage that has been experienced in the body of Type II Diabetes Mellitus patients in the Medan Amplas Puskesmas Working Area.

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