

**Internet-Mobile-Based Acceptance and Commitment Therapy (ACT) Against Diabetes Mellitus Distress: A Systematic Review****Wahyu Dini Candra Susila¹, Nurwahidah^{2*}, Wahyu Dini Metrikayanto³**¹Nursing Study Program Stikes Adi Husada Surabaya, Indonesia²Faculty of Nursing, Airlangga University, Surabaya, Indonesia³Nursing Study Program, Faculty of Health Sciences, Tribhuwana Tungadewi University, Malang, Indonesia**Correspondent Author:**

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nurwahidah.wdcs@gmail.com**Keywords :**

Acceptance and Commitment Therapy (ACT), Diabetes Mellitus, Distress, Internet-Mobile

Abstract

An intervention that can be used by nurses who treat DM patients is acceptance and commitment therapy (ACT). ACT is a therapy that has the goal of helping individuals to be able to accept unpleasant self-experiences and be willing to commit to behaving and acting in accordance with values so as to achieve a more valuable life. Diabetes can also cause stress which is usually called diabetes distress. One strategy that can be used at this time is the use of the internet–mobile–based interventions. Systematic review is based on Preferred Reporting Items for Systematic Review and Meta-Analyzed (PRISMA). The databases used are Scopus, Proquest, Science Direct, and Pubmed which are limited to publications for the last 5 years from 2018 to 2022, full-text articles, and use English. The keywords used in the search for articles are "Diabetes Mellitus" AND "Acceptance and Commitment Therapy" AND "mobile" AND "Distress". This systematic review uses 10 articles that meet the inclusion criteria. The initial literature search yielded 56 articles. There are 10 articles selected for review. conclusions: The results of this systematic review provide evidence for policymakers to consider alternative interventions using this method to reduce distress in patients with diabetes mellitus.

INTRODUCTION

Diabetes Mellitus or commonly known as DM is a metabolic disease that has characteristics such as hyperglycemia caused by abnormalities in insulin secretion, insulin action, or both (PERKENI, 2019). According to data from the World Health Organization (WHO), diabetes mellitus is a disease that is included in the four non-communicable diseases (NCD) that cause the highest death in the world. (WHO, 2020). The IDF stated that currently there are 10.7 million people in Indonesia with DM (IDF, 2019). According to the International Diabetic Federation, the global prevalence rate of DM sufferers has increased in 2018 to 422 million cases. Indonesia is a country that ranks 4th with DM sufferers with a total of 8.4 million sufferers after India, China, and the United States (Kemenkes RI, 2018). The incidence of DM according to Riskesdes (2018), when compared to 2013 data, the prevalence of DM based on a doctor's diagnosis in residents aged ≥ 15 years from the 2018 Riskesdas results increased to 2%.

DM sufferers in Indonesia are predicted to continue to experience a significant increase in the coming years (IDF, 2019). According to (ADA, 2018), the cornerstone of diabetes management includes lifestyle management and psychosocial care. DM sufferers can result in disturbances in controlling blood sugar levels. Under conditions of stress, there will be an increase in the excretion of catecholamine hormones, glucagon, glucocorticoids, β -endorphins, and growth hormone. Clinically stress is caused by excess production of cortisol, cortisol is a hormone that counteracts the effects of insulin and causes high blood sugar levels (Wahyuningsih & Tamimi, 2021).

Interventions or actions that can be used by nurses who treat DM patients are acceptance and commitment therapy (ACT). Acceptance and Commitment Therapy is a therapy that has the goal of helping individuals to be able to accept unpleasant self-experiences and be willing to commit to behaving and acting in accordance with values so as to achieve a more valuable life (Hayes et al., 2006).

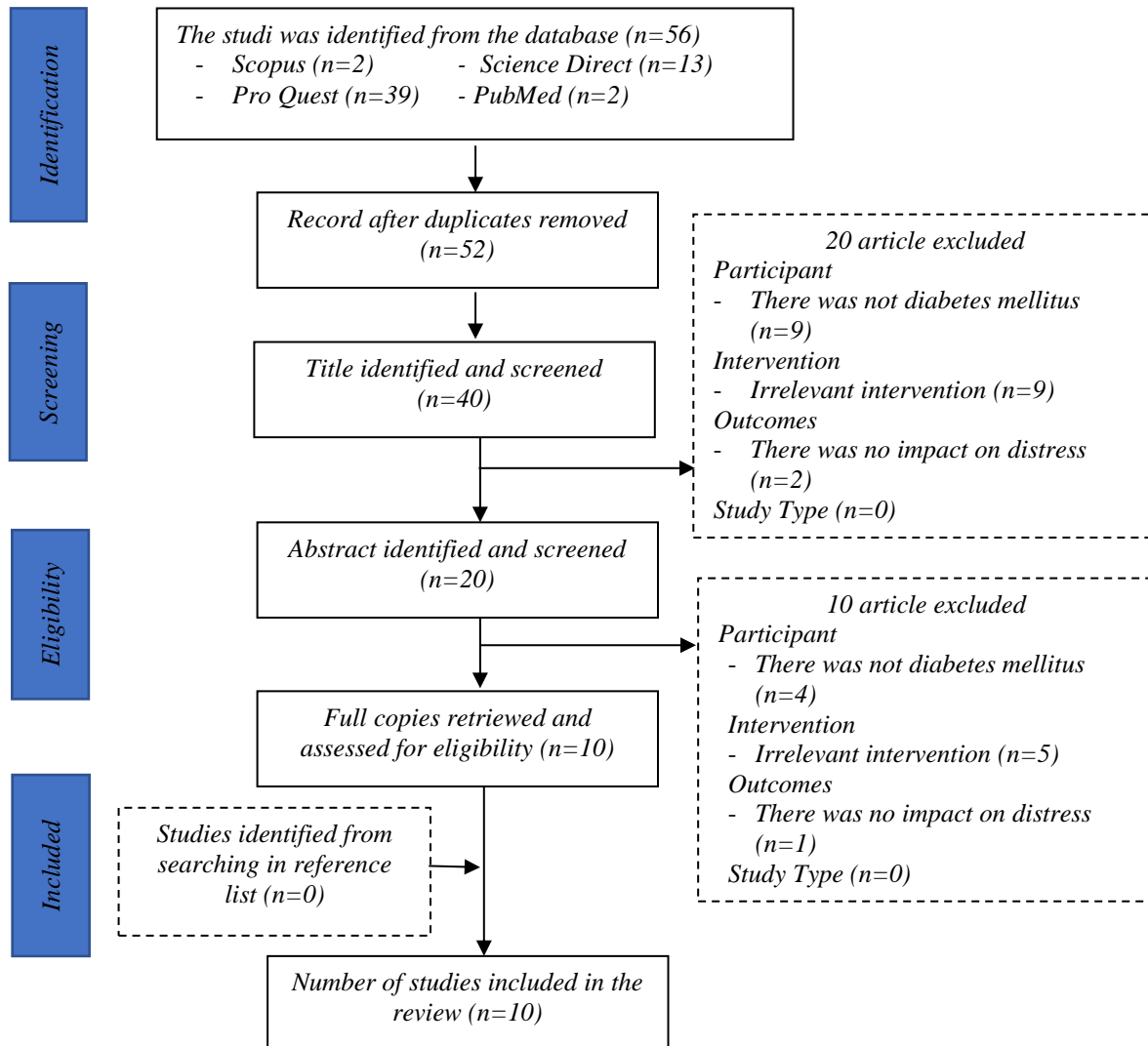
One strategy that can be utilized at this time is the use of internet-mobile-based interventions. Research results related to internet-mobile-based ACT interventions have been widely used. It is easier for patients and health workers to carry out this intervention even though they don't meet face to face. Based on the background considerations above, the authors are interested in finding and observing Internet-Mobile-Based Acceptance and Commitment Therapy (ACT) Against Diabetes Mellitus Distress. The purpose of this systematic review is to seek and observe in depth related to Internet-Mobile Based Acceptance and Commitment Therapy for the Distress of Diabetes Mellitus.

RESEARCH METHOD

This systematic review was prepared based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The databases used are Scopus, Proquest, Science Direct and Pubmed limited to publications for the last 5 years from 2018 to 2022, full text articles and using English. The keywords used in the search for articles are "Diabetes Mellitus" AND "Acceptance and Commitment Therapy" AND "mobile" AND "Distress". After several articles were found, the authors analyzed and synthesized the articles according to the specified inclusion and exclusion criteria. The inclusion criteria in this systematic review were (1) focusing on diabetes mellitus patients, (2) using the Acceptance and Commitment Therapy (ACT) intervention (3) internet-mobile based. Exclusion criteria in this systematic review were (1) chronic disease patients but not diabetes mellitus, (2) not internet-mobile based. The process of searching for articles will be carried out in December 2022. The data obtained is then selected to determine the suitability of the desired article and delete the same article. Articles that are suitable are then analyzed and grouped to get the results. Next is to discuss based on the articles obtained from the selection results.

RESULT

An initial literature search yielded 56 articles (2 from Scopus, 39 from Proquest, 13 from Science Direct and 2 from Pubmed). There were 10 articles selected for review, as listed in Table 2.



Picture 1.
Literature Search Flowchart (Nursalam, 2020).

In this section, the author selects articles that have been obtained based on predetermined keywords. Previously, reviewers used the PICOS format as an indicator for assessing the suitability of articles. The PICOS criteria created can be seen in the following table:

Table 1.
Article Criteria

Criteria	Inclusion	Exclusion
Population	The study consisted of Diabetes Mellitus	Patients with chronic disease but not Diabetes Mellitus
Intervention	Acceptance and Commitment Therapy	Does not discuss Acceptance and Commitment Therapy
Comparison	No comparator	No comparator
Outcome	Distress	Does not discuss distress
Study design & publication type	Quasi-experimental, randomized control and trial,	Literature review, narrative review, Systematic review, a scoping review
Publication year	Post-2018	Pre-2018
Language	English	Language other than English

Table 2.
Internet-Mobile Based ACT Against Diabetes Mellitus Distress

No	Article Title, Researcher Name, Year	Criteria Used	Discussed
1.	<i>ACTonDiabetes—a guided psychological internet intervention based on Acceptance and Commitment Therapy (ACT) for adults living with type 1 or 2 diabetes: results of a randomized controlled feasibility trial</i> (Bendig et al., 2021)	<ul style="list-style-type: none"> • Internet-based intervention using ACT • Using 7 ACT Sessions • Performed for 7 weeks • Done using SMS (short message service) - Coach • In DM Type 1 and 2 	ACT on Diabetes can provide appropriate interventions for patients with diabetes and diabetic distress. This can help people maintain psychosocial health and further reduce diabetes distress.
2.	<i>ACTonDiabetes: study protocol of a pragmatic randomized controlled trial for the evaluation of an acceptance and commitment-based internet-based and mobile-based interventions for adults living with type 1 or type 2 diabetes</i> (Bendig et al., 2022)	<ul style="list-style-type: none"> • Internet-based and mobile interventions using ACT • Using 8 ACT Sessions • Performed for 8 weeks • Done using SMS (short message service) – Coach • In type 1 and 2 DM 	The primary outcome is a reduction in diabetic distress. Diabetic distress reduction will also be evaluated at 6-month follow-up and 12-month follow-up as a secondary outcome.
3.	<i>An open trial of app-assisted acceptance and commitment therapy (iACT) for eating disorders in type 1 diabetes</i> (Merwin et al., 2021)	<ul style="list-style-type: none"> • Internet-based intervention using ACT (iACT) • Using 12 ACT Sessions • Performed for 12 weeks (3 months) • Done using the iACT-assisted app • In DM Type 1 	Diabetic distress (DDS score) decreased from the start to the end of treatment.
4.	<i>Predicting Acceptance of e-Mental Health Interventions in Patients With Obesity by Using an Extended Unified Theory of Acceptance Model: Cross-sectional Study</i> (Rentrop et al., 2022)	<ul style="list-style-type: none"> • Intervention based on e-mental health intervention using ACT • Done using mobile-phone or email, digital media • In several diseases, one of which is DM. 	The general psychological distress of the participants in this study was high, as measured by a valid psychometric instrument. The variation explained by acceptability in the restrictive (3 core predictor) UTAUT model was high, but the expanded UTAUT model was slightly but significantly better compared and highlighted three additional significant predictors (depression, stress due to constant availability via cell phone or email, and confidence in using digital media).
5.	<i>Lessons Learned from an Attempted Pragmatic Randomized</i>	<ul style="list-style-type: none"> • Internet based intervention using ACT • Using e-mail 	No treatment effect was found related to reducing pain disorders. Thus, the higher pain resilience in this population group compared to the

<p><i>Controlled Trial for Improvement of Chronic Pain-Associated Disability in Green Professions: Long-Term Effectiveness of a Guided Online-Based Acceptance and Commitment Therapy (PACT-A)</i> (Braun et al., 2022)</p>	<ul style="list-style-type: none"> • In chronic pain disease, one of which is DM 	<p>general population may be a possible reason for experiencing fewer negative beliefs and lower psychological distress from chronic pain, which in turn would explain why this sample of the population does not respond positively. both the psychology of ACT-based treatment approaches.</p>
<p>6. <i>An mHealth Intervention for Persons with Diabetes Type 2 Based on Acceptance and Commitment Therapy Principles: Examining Treatment Fidelity</i> (Nes et al., 2018)</p>	<ul style="list-style-type: none"> • Internet based intervention (mHealth Intervention) using ACT • Done using the web • In DM type 2 	<p>Web-based psychological interventions to support people with chronic conditions are becoming increasingly popular. This study supports the results of previous studies showing that the ACT can be delivered reliably in a written web-based format.</p>
<p>7. <i>The effects of acceptance and commitment therapy on eating behavior and diet delivered through face-to-face contact and a mobile app: a randomized controlled trial</i> (Järvelä-Reijonen et al., 2018)</p>	<ul style="list-style-type: none"> • Contact based intervention face-to-face mobile application using ACT 	<p>ACT-based interventions delivered in the Face-to-Face group sessions or by the Mobile app showed beneficial effects on some of the reported aspects of eating behavior and were most pronounced in the Face-to-Face group.</p>
<p>8. <i>Efficacy of Acceptance and Commitment Therapy for emotional distress in the elderly with type 2 diabetes: A randomized controlled trial</i> (Maghsoudi et al., 2019)</p>	<ul style="list-style-type: none"> • Intervention using ACT • Using 8 ACT Sessions • In type 2 diabetes 	<p>ACT resulted in improvements in diabetes-related emotional distress in the intervention group. Given the effectiveness of ACT, this therapy method is recommended to be used to improve emotional distress in the elderly with type 2 diabetes.</p>
<p>9. <i>The effects of Acceptance and Commitment Therapy (ACT) Intervention on inflammation and stress biomarkers: a randomized controlled trial</i> (Järvelä-Reijonen et al., 2020)</p>	<ul style="list-style-type: none"> • Intervention using ACT • In Chronic low-grade systemic inflammation 	<p>The results show that ACT delivered in group sessions can exert beneficial effects on low-grade systemic inflammation. More research is needed on how best to apply psychological interventions for mind and body health among people with overweight/obese and psychological distress.</p>
<p>10. <i>Acceptance and Commitment Therapy: A Transdiagnostic Behavioral Intervention for Mental Health and Medical Condition</i> (Dindo et al., 2017)</p>	<ul style="list-style-type: none"> • Intervention using ACT • On mental health and medical conditions 	<p>As a transdiagnostic and flexibly delivered approach, ACT represents a promising way to meet the heterogeneous needs and treatment preferences of patients with a variety of problems, including mental health, medical, behavioral, and co-occurring mental and physical health symptoms..</p>

DISCUSSION

Diabetes Mellitus (DM) is a metabolic disease characterized by hyperglycemia due to abnormalities in insulin secretion, insulin action or both (PERKENI, 2019). DM is a serious chronic condition if there is an increase in blood glucose levels so that the body cannot produce insulin or cannot effectively use insulin (WHO, 2020). DM is a disease that cannot be cured and carried for life so that it can cause acute and chronic complications, premature death and others (Rondhianto et al., 2021).

One of the components of a comprehensive evaluation of diabetes patients is their psychosocial condition (PERKENI, 2019). According to ADA (2018), the cornerstone of diabetes management includes lifestyle management and psychosocial care (ADA, 2018). Interventions or actions that can be used by nurses who treat DM patients are acceptance and commitment therapy (ACT). Acceptance and Commitment Therapy is a therapy that has the goal of helping individuals to be able to accept unpleasant self-experiences and be willing to commit to behaving and acting in accordance with values so as to achieve a more valuable life (Hayes et al., 2006).

The use of the internet-mobile-based ACT intervention is expected to be a solution in solving health problems that have obstacles to access to health services that are far away or in the current era of digitalization. Internet-mobile can also be an alternative to reduce costs in carrying out treatment, besides that it is also more efficient. The thing that shows that online-based ACT can also have an impact on the distress felt by DM patients, namely research by Bendig et al., (2021) that the ACT on diabetes can provide appropriate interventions for diabetes patients and diabetic distress, this can help people maintain psychosocial health and further reduce diabetes distress. The same research by Bendig et al., (2022), also mentioned that the main results in the study entitled “*ACTonDiabetes: study protocol of a pragmatic randomised controlled trial for the evaluation of an acceptance and commitment-based internet-based and mobile-based intervention for adults living with type 1 or type 2 diabetes*” is reduction of diabetic distress, but reduction of diabetic distress will also be evaluated at the 6-month follow-up and 12-month follow-up as a secondary outcome. This is also supported by research Merwin et al., (2021) that diabetes distress (DDS score) decreased from the beginning to the end of the treatment that had been carried out.

From the ten articles found, there is one research article by Braun et al., (2022) which explained that there was no treatment effect related to reducing pain disorders. The higher pain tolerance in this population group compared to the general population may be a possible reason for experiencing fewer negative beliefs and less psychological distress from chronic pain. So that in turn would explain why this sample population did not respond well to the ACT-based psychological treatment approach.

However, of the ten research articles, nine articles mentioned that Internet-based ACT had quite a good impact. Therefore, further research is needed regarding internet-based ACT related to its impact on other things related to diabetes mellitus patients. So that it will add insight and knowledge regarding the interventions used and ways that can be done to support the provision of effective and efficient interventions.

CONCLUSION

The ACT psychotherapy intervention is proven to be carried out using the online method. The results of this systematic review provide evidence for policy makers to consider mobile-based acceptance and commitment therapy interventions to provide alternatives to reduce distress in Diabetes Mellitus patients. This intervention can be used as an alternative in dealing with conditions to limit face-to-face meetings with patients and caregivers such as during the Covid-19 pandemic and as a complement to other interventions that have evidence and research results. This opportunity can be used as an alternative to increase the efficiency of psychotherapy to reduce stress on patients and increase the effectiveness of treatment

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