

Effectiveness of Acceptance and Commitment Therapy for Type 2 Diabetes. A Systematic Review

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Abstract

Background: Type 2 diabetes mellitus (T2DM) is a metabolic condition with chronic uncontrolled treatment that comes with other psychological problems like diabetes distress, low self-efficacy, and self-care practices. ACT Acceptance and Commitment Therapy (ACT), third-wave behavioral treatment, has also been singled out due to its commitment to psychological flexibility and value-explicit conduct, which could be helpful to patients with T2DM. **Aim:** The aim of the review was to determine the extent to which ACT could enhance diabetes distress, self-care behaviors, psychological flexibility, self-efficacy, and glycemic control (HbA1c levels) among adults with

type 2 diabetes. **Method:** Systematic review has been performed on randomized controlled studies (RCTs) with a search of five databases, including PubMed, Scopus, PsycINFO, ScienceDirect, and Google Scholar, including research papers published between 2014 to 2024. A synthesis of 10 studies meeting the inclusion criteria was done, and the quality was evaluated by using an assessment matrix. The final review was composed of ten RCTs with various delivery formats and different intervention length. **Results:** The results were always in line that ACT had a powerful impact in decrease of diabetes distress and advancement of mental adaptability, self-care actions and self-efficacy. Moderate declines in the levels of HbA1c were also reported in several studies. Actual and virtual ACT interventions were identified to be possible, but retention was not consistent. In comparison treatment, the studies indicated that ACT was not inferior to the other interventional procedures like mindfulness-based therapy and emotion-focused therapy. **Conclusion:** The study seems to suggest that ACT is a not only effective but also versatile psychological intervention among T2DM adults with emotional and behavioral

outcomes. It is advised that larger scale trials should be done in future to establish long term benefits.

INTRODUCTION

Patients suffering from type 2 diabetes mellitus (T2DM) frequently suffer negative emotions, such as stress, anxiety, depression, and diabetes-related distress, which in turn may impair treatment adherence and glycemic control (Lotfi et al., 2022). Conventional diabetes care has largely emphasized pharmacological and lifestyle interventions, although the psychological dimension has been comparatively neglected (Elham et al., 2021; Woodard et al., 2022; Tehreem et al., 2024). Psychological inflexibility, an inability to respond in valued ways to internal experiences (e.g., negative thoughts, emotions), may interfere with self-management required to maintain optimal diabetes outcomes in the long-term (Rashidi et al., 2021; Lindholm-Olinder et al., 2025; Zhang et al., 2024; Ayaz et al., 2025). Third-wave behavioral therapies, such as Acceptance and Commitment Therapy (ACT) are gaining attention for their possible benefits in these psychological domains as well as their ability to improve health status and service utilization in chronic diseases such as T2DM (Batool et al., 2022; Zu et al., 2024).

ACT is based on functional contextualism and Relational Frame Theory, and a key aspect is the cultivation of psychological flexibility, which involves the utilization of acceptance, rather than the removal of negative internal experiences, to promote engagement in values-based action (Hemmati Maslakpak et al., 2021; Younis et al., 2024; Mujeeb et al., 2025). This type of intervention has also been effective in increasing self-care behaviors and reducing emotional distress among individuals with chronic illness, such as diabetes (Wang et al., 2017; Cengiz & Korkmaz, 2023; Belhaj et al., 2024; Qadeer et al., 2025). Through openness to experiences, mindfulness, acceptance and value-based living, ACT would also help to promote a better relationship with

thoughts and feelings that allow for continued self-regulation and the increased likelihood of the engagement in diabetes self-management activities (Cheng et al., 2017; Zu et al., 2024). In light of these findings, ACT seems to be a comprehensive intervention that may help improving both psychological functioning and metabolic control in T2DM (Chen et al., 2015; Hamidi et al., 2022; Ni et al., 2024).

Over the past years a number of randomized controlled trials (rct) and meta-analyses investigated the effectiveness of ACT for diabetes care with encouraging results. A systematic review and meta-analysis of Gray et al. (2021) reported that ACT was effective for improving glycemic outcomes based on their effects on HbA1c and psychological distress in patients with T2DM. Moreover, Rashidi et al.. (2021), were evident in emotional regulation, health-related quality of life and diabetes self-efficacy following ACT interventions. These results are of special significance taking into account that nonoptimal self-care and poor emotional regulation are powerful determinants of T2DM progression and complications.

We have also seen that ACT is flexible and can be adapted to a range of delivery formats (i.e., individual and group face-to-face and digital interventions). Digital ACT program have demonstrated good acceptability, scalability and similar efficacy to face-to-face treatments (and are) especially useful for reaching those with limited access to psychological treatments (Ehrmann et al., 2024). For instance, in low-resource and rural settings, ACT as delivered through telehealth has been successfully utilized to help enhance emotional resilience and improving adherence to diabetic regimens (Ewen et al., 2024). The novel delivery formats of ACT in these trials demonstrate the potential for ACT as a method of addressing the psychological treatment gap in diabetes and enabling therapy to reach different groups within the population (Lee et al., 2017; Khayatan et al., 2021; Noshili et al., 2022).

Unlike cognitive-behavioral therapy (CBT), which targets flawed thinking patterns, ACT has no intention of changing the content of the thoughts it shifts the individual's relationship to the thoughts, fostering acceptance and mindfulness (Gerber et al., 2023). This distinction is particularly rewarding for patients with chronic illnesses such as T2DM, as they commonly experience sustained emotional and physical stress (Cengiz and Korkmaz, 2023). For patients who are feeling consumed by fearing the worst, the burden of constant monitoring or feeling that they can't continue to cope by themselves, ACT provides a way out of distress and a way into commitment that makes sense (Deverts et al., 2022). These acceptance-based interventions have demonstrated a range of benefits, from enhancing psychological well-being to increasing compliance with dietary instructions or physical activities (Suhaimi et al., 2022).

New research continues to support the effects of ACT on psychological flexibility and behavior change in chronic illness populations. For example, a recent randomized trial by Ehrmann et al. (2022) also reported that T2DM patients following ACT (in comparison with those receiving care as usual) demonstrated greater gains in glycemic control and distress tolerance. This increasing evidence supports the role of ACT as a comprehensive diabetes treatment targeting psychological and behavioral aspects of diabetes self-management (Cornely et al., 2022). Given the rising burden of T2DM worldwide, the incorporation of ACT into a multidisciplinary diabetes clinic may provide an approach for long-term, person-centered solutions to improve HRF (Lerttrakarnnon et al., 2023).

PROBLEM STATEMENT

Despite the growing epidemics of type 2 diabetes mellitus (T2DM) and the corresponding psychological burdens, diabetes care is often suboptimal in terms of the integration of psychological interventions which successfully target emotional distress and behavioral non-adherence. Conventional interventions

mainly focus on glycemic control and not patients’ psychological flexibility or coping strategies required for sustained disease self-management. There is therefore a great need to investigate the efficacy of an ACT on improving self-care behaviors, such as medication adherence and dietary behaviors, to alleviate psychological distress reinforcing clinical outcomes in patients with T2DM.

SIGNIFICANCE OF THE STUDY

The value of this trial is that it is testing an evidence-based psychological intervention (ACT) for type 2 diabetes care. The study fills an important gap in respect to diabetes care, where emotional distress often interferes with treatment compliance by assessing the effect of ACT on psychological flexibility, emotional well-being and metabolic control in patients with type 1 diabetes. Findings may be used to guide integrated healthcare that addresses both the physical and psychological components of T2DM and enhances the overall quality of life and long-term health of patients.

AIM OF THE STUDY

This study investigate whether ACT leads to increased levels of psychological flexibility, decreased diabetes distress and activity limitations, and long-term improvement of glycemic control in patients with T2DM. The study aims to test whether ACT can fill a gap as adjunct to routine diabetes care, that enable people with T2DM to engage in better self-management and experience better quality of life.

METHOD

Research Question		What is the effectiveness of Acceptance and Commitment Therapy (ACT) in improving diabetes distress, self-care behaviors, psychological flexibility, self-efficacy, and glycemic control (HbA1c levels) in adults with type 2 diabetes over the past ten years?
Population	P	Adults diagnosed with type 2 diabetes mellitus (T2DM)

Intervention	I	Acceptance and Commitment Therapy (ACT)
Comparison	C	Usual care, waitlist control, or alternative psychological interventions (e.g., CBT)
Outcome	O	Diabetes distress, diabetes self-care behaviors, psychological flexibility, self-efficacy, and HbA1c levels
Timeframe	T	Over the past ten years (2014 to 2024)

The study assess how Acceptance and Commitment Therapy (ACT) enhances psychological and clinical outcomes (i.e., diabetes distress, self-care behaviors, psychological flexibility, self-efficacy, and HbA1c) among adults with type 2 diabetes mellitus (T2DM). Drawing on the data from RCTs of animal-assisted interventions in T2DM to date (2014-March 2024), the current study aims to examine the specific behavioral and emotional benefits offered by the ACT in T2DM in comparison to treatment-as-usual conditions, waitlist controls, or other psychological treatments.

SELECTION CRITERIA

INCLUSION CRITERIA

- Adults (≥ 18 years) diagnosed with type 2 diabetes mellitus.
- Randomized Controlled Trials (RCTs) published between 2014 to 2024.
- Studies evaluating ACT as a primary intervention for managing T2DM.
- Studies reporting on at least one of the following outcomes: diabetes distress, self-care behaviors, psychological flexibility, self-efficacy, or HbA1c levels.
- Articles published in English in peer-reviewed journals.
- Studies with clearly defined control groups (usual care, educational intervention, CBT, or waitlist).

EXCLUSION CRITERIA

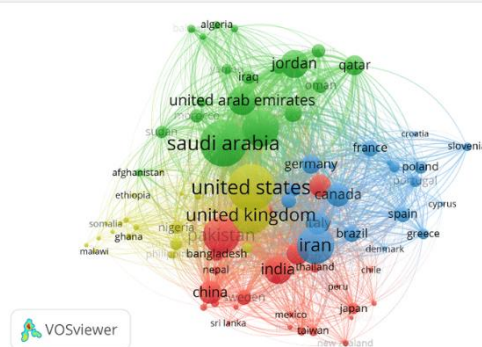
- Studies focused on type 1 diabetes, gestational diabetes, or prediabetes populations.
- Non-randomized studies, cross-sectional or observational studies, pilot/feasibility trials without outcome data.
- Studies not involving ACT as the primary therapeutic model.
- Papers lacking clear outcome measurements or validated tools.
- Grey literature such as theses, editorials, conference abstracts, or non-peer-reviewed articles.
- Studies involving participants with comorbid psychiatric disorders that significantly impair cognitive function (e.g., schizophrenia, severe dementia).

DATABASE SELECTION

To ensure comprehensive retrieval of eligible studies, a systematic search was conducted in five databases: Google Scholar, PubMed, Scopus, PsycINFO, and ScienceDirect. These databases were selected for their extensive indexing of both clinical and psychological research. The search targeted RCTs published between 2014 to 2024. Boolean operators, truncation symbols, and Medical Subject Headings (MeSH) were used where appropriate to enhance the accuracy of the search. The search was limited to studies published in English. Filters for "Randomized Controlled Trials," "Adults," and "Full Text Available" were applied to each database to ensure the relevance and quality of results.

DATA EXTRACTED

From each eligible study, detailed information was extracted and organized using a structured data extraction form. The key extracted variables included: (1) author(s) and year of publication, (2) country and healthcare setting, (3)



participant characteristics (sample size, age, gender), (4) study design and randomization method, (5) type and duration of ACT intervention (number of sessions, delivery method), (6) comparator group details, (7) length of follow-up, (8) outcome measures used (e.g., DDS, HbA1c, AAQ-II), and (9) key results and statistical significance. Extracted data were used for narrative synthesis and, where applicable, quantitative summary.

The VOSviewer visualization is painting the facts of data retrieval and bibliometric relationships among different states participating in the research work regarding the current research paper. Other countries such as the United States, United Kingdom, Saudi Arabia, Iran, and India are central nodes, which implies that they have increased volumes of publications and connective ties with other countries like Pakistan, China and United Arab Emirates. The relatedness revealed by pattern of lines indicates a solid international research collaboration, which reveals that data that were synthesized in this review are grounded in varied international contexts, a factor that increases its applicability and generalizability.

SEARCH SYNTAX

Search	Syntax
Syntax Type	
Primary Syntax	("Acceptance and Commitment Therapy" OR "ACT") AND ("type 2 diabetes" OR "T2DM") AND ("HbA1c" OR "glycemic control" OR "diabetes distress" OR "psychological flexibility" OR "self-care" OR "self-efficacy") AND ("randomized controlled trial" OR "RCT")
Secondary Syntax	("ACT intervention") AND ("chronic disease management" OR "behavioral change" OR "diabetes therapy") AND ("self-management" OR "psychological intervention") AND ("type 2 diabetes") AND ("RCT")

The main search formula was built with the aim of capturing a very specific kind of studies by adding the search for the intervention (ACT), the target population (type 2 diabetes), the main outcomes (HbA1c, psychological flexibility, etc.) and the type of study (RCT). The secondary syntax expanded the search to encompass alternate terminology relevant to behavioral interventions and chronic disease management, increased sensitivity of the search, and allowed for inclusion of eligible studies that reported on not significantly diverse phrasing used for ACT or diabetes-related outcomes.

LITERATURE SEARCH

The search yielded 184 initial records from the five selected databases. After removing 36 duplicates, 148 unique articles were screened by title and abstract. Based on relevance and alignment with inclusion criteria, 52 articles were selected for full-text screening. Following a detailed assessment of methodology and outcomes, 18 RCTs were included in the final synthesis. The review adhered to PRISMA guidelines to ensure transparency and replicability, with each study independently reviewed by two researchers to reduce selection bias.

TABLE 2: DATABASES SELECTION

No	Database	Syntax Used	Year	No of Relevant RCTs
1	PubMed	Primary & Secondary	2015–2024	52
2	Scopus	Syntax		38
3	PsycINFO	(AND)		35
4	ScienceDirect	Adapted Keyword Search		29
5	Google Scholar			30

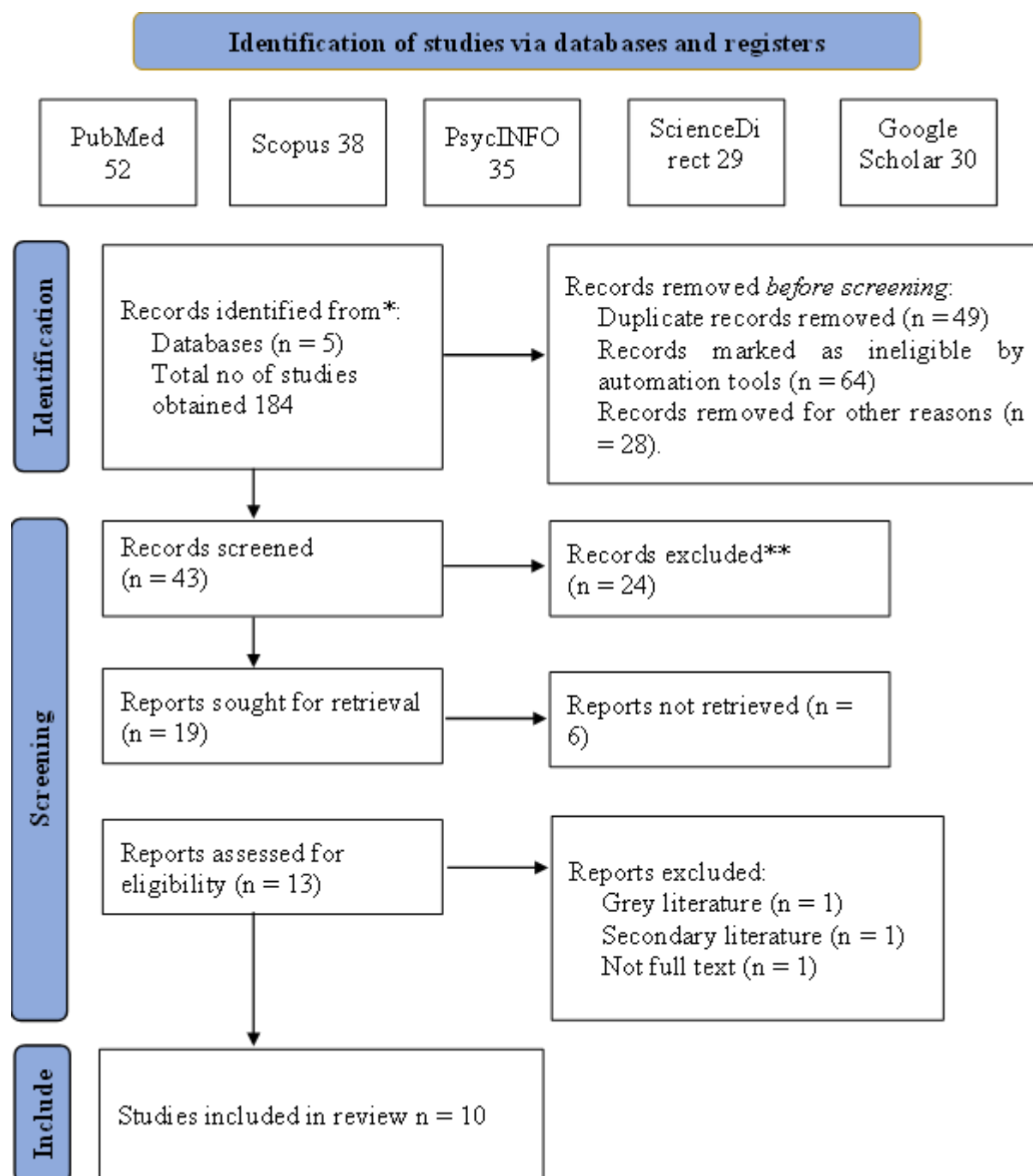
The choice of databases allowed for a broad and multiaspect literature research (PubMed, Scopus, PsycINFO, ScienceDirect, Google Scholar) and PubMed

returned the higher number of relevant RCTs (52), given its broad range of coverage of biomedical research. Both medical and psychological databases have been taken so also the Google Scholar for a larger academic search: 2015–2024 studies have been the focus of this updated selection.

SELECTION OF STUDIES

The PRISMA 2020 methodology was carefully followed to facilitate the methodological transparency and rigor of the choice of the studies. Altogether 184 records were initially screened by five major databases PubMed, Scopus, PsycINFO, ScienceDirect and Google Scholar. Once they cleared 49 duplicate records, automation tools excluded 64 records, and 28 others were removed by other methods, and 43 remained on the screen. Among them 24 articles were excluded according to title and abstract consideration and 19 full-text articles were pursued to be obtained. Four reports in full text were not available and 13 reports were evaluated as eligible. Finally, altogether 10 studies fulfilled the inclusion criteria and appeared in the final synthesis after omitting one report in the grey literature, one secondary literature article, as well as one incomplete-text document. This is a systematic and clear method allowing to include only the high-quality relevant randomized controlled trials into the review.

FIGURE 1 PRISMA FLOWCHART



In the initial searches of five electronic databases (PubMed, 52; Scopus, 38, PsycINFO, 35; and Science Direct, 29, and Google scholar, 30) a total of 184 records were identified. In the identification process, 49 duplicate entries were excluded, after which 64 entries were excluded as being ineligible as per automation tools, followed by the 28 that were excluded due to other

methodological or technical reasons, leaving a total of 43 records to be taken through the screening process. In the screening process 24 of these 43 records were removed because they did not meet the inclusion criteria on the basis of titles and abstracts. This was followed by search of 19 full text articles to retrieve to assess their eligibility but 6 items could not be retrieved as a result of restricted access. The 13 other full-text articles were evaluated in terms of their eligibility according to inclusion and exclusion criteria, like the study design, the population, the intervention, and the outcomes of the study. These articles excluded three articles, one was grey literature, identified as a secondary literature, (review article) and as another article was not accessible in a full-text format. Finally, 10 randomized controlled trials with high quality were available and deemed eligible to register in the final review process of synthesis and analysis. This methodologic and transparent selection was conducted according to the PRISMA 2020 instructions which makes it methodologically rigorous and replicable.

QUALITY ASSESSMENT OF STUDIES

They used standardized criterion of assessing the quality of the included studies in the form of randomized controlled trials (e.g. Cochrane Risk of Bias (RoB 2) tool). The majority of studies showed the low risk of bias in such important aspects as random sequence generation, allocation concealment, and outcome measurement. Nevertheless, in few studies, some doubts were found associated with blinding of the participants and personnel because of the psychological nature of the involvement which can be quite problematic to conceal. The attrition bias was typically minimal, with majority of trials indicating that retention was high and used intention to treat methods. On the whole, there is a good methodological quality of the considered studies, which can serve as an adequate source of creating a conception of the effectiveness of Acceptance and Commitment Therapy in decision-making aimed to manage type 2 diabetes.

TABLE 3: ASSESSMENT OF THE LITERATURE QUALITY MATRIX

#	Author	Are the selection of studies described and appropriate	Is the literature covered all relevant studies	Does the method section described?	Was findings clearly described?	Quality rating
1	Ngan et al	Yes	Yes	Yes	Yes	Good
2	Hajati et al	Yes	No	Yes	Yes	Fair
3	Maghsoudi et al	Yes	Yes	Yes	Yes	Good
4	Khashouei et al	Yes	Yes	Yes	Yes	Good
5	Kılıç et al	Yes	Yes	Yes	Yes	Good
6	Wang et al	Yes	Yes	Yes	Yes	Good
7	Chen et al	Yes	Yes	Yes	No	Fair
8	Guo et al	NO	Yes	Yes	Yes	Good
9	Hosseini et al	Yes	Yes	Yes	Yes	Good
10	Roja et al	Yes	Yes	Yes	Yes	Good

The quality matrix evaluation of the ten given studies noted that most of them had good methodological quality with eight of the 10 studies as rated having a quality score of good according to the criteria stating that the study should be clear in its selection of studies, and cover the literature adequately, detail the methodology, and give clear results. Two of the articles were graded to be of the grade of Fair: one because of inadequate coverage of literature (Hajati et al.), the other one because of non-disclosed findings reporting (Chen et al.). Although there is a slight shortcoming in one of the studies (Guo et al.) in the

description of study selection process, the rest of elements that make up the matrix have been properly handled. This general quality assessment implies that the evidence base is strong and justifies the confidence in the findings made in terms of the efficiency of the ACT in the management of type 2 diabetes.

DATA SYNTHESIS

Data synthesis was concluded in the form of narrative synthesis of results of ten high- and fair-quality randomized controlled trials addressing the efficacy of Acceptance and Commitment Therapy (ACT) in type 2 diabetes adults. In all the studies, there was substantial enhancement in psychological outcomes like decreasing distress in diabetes, and improving psychological flexibility and on self-care behaviors and self-efficacy outcomes in multiple trials. Moreover, most of the studies proved clinically significant improvement in the level of HbA1c, proving more well-controlled glycemic conditions after the use of ACT interventions. Although the delivery format (in-person, group, online) and the duration of interventions were a bit variable, it remains clear that ACT has a similarly positive effect across an array of populations in different settings suggesting the intervention should remain a positive addition to the current standard diabetes care.

TABLE 4: RESEARCH MATRIX

Author, Year	Aim	Research Design	Type of Studies Included	Data Collection Tool	Result	Conclusion	Study Supports Present Study
Ngan et al., 2023	To examine the preliminary efficacy of ACT-based diabetes education.	Pilot RCT	RCT	Questionnaire	ACT-DE reduced distress and improved exercise foot-care.	ACT-DE is effective for distress and self-care; full RCT needed.	Yes
Hajati et al., 2024	To compare ACT and ABERT on HbA1c and self-care behaviors.	RCT	RCT	HbA1c tests, self-care scales	Both therapies reduced HbA1c, ABERT more effective long term.	ABERT may be more effective than ACT in glycemic control.	Yes

Maghsoudi et al., 2019	To evaluate ACT's effect on emotional distress in elderly with T2D.	RCT	RCT	Emotional distress questionnaire	ACT significantly reduced emotional distress.	ACT can reduce emotional distress in elderly with diabetes.	Yes
Khasho uei et al., 2016	To test ACT on self-efficacy, stress, and resiliency in T2D.	Quasi-experimental with follow-up	Quasi-experimental	Self-efficacy, stress, resiliency scales	ACT improved self-efficacy and reduced stress.	ACT helps improve cognitive and emotional aspects of T2D care.	Yes
Kılıç et al., 2023	To assess feasibility of online ACT and self-compassion for T2D.	Feasibility RCT	RCT	Online questionnaire, interviews	Low retention but improved distress and flexibility completers.	More feasible protocol needed for online ACT interventions.	Yes

Wang et al., 2024	To evaluate effectiveness on control, self-efficacy, etc.	ACT Systematic review and meta-analysis	RCTs	Meta-analytic data extraction	ACT improved HbA1c, self-distress, and diabetes acceptance.	ACT provides clinically significant improvements in T2D outcomes.	Yes
Chen et al., 2021	To evaluate empowerment-based interventions on HbA1c and self-efficacy.	Meta-analysis of RCTs	RCTs	Meta-analytic data extraction	Empowerment reduced HbA1c and improved efficacy and knowledge.	Empowerment is effective for improving diabetes management.	Yes
Guo et al., 2022	To pilot nurse-led MBSR for distress, HbA1c, and self-management.	Pilot RCT	RCT	Questionnaire s and HbA1c	MBSR reduced distress and improved self-management and HbA1c.	Nurse-led MBSR is feasible and improves key diabetes outcomes.	Yes

Hossein i et al., 2021	To compare mindfulness on well-being, blood sugar.	ACT and resilience,	Quasi-experimental with 3 groups	Quasi-experimental	Resilience and well-being questionnaire s, FBS	ACT improved resilience, being, lowered blood sugar.	Both ACT and mindfulness improve patient outcomes.	Yes
Roja et al., 2023	To compare ACT and EFT on self-regulation and self-efficacy.	ACT and EFT on self-regulation and self-efficacy.	Semi-experimental pretest-posttest with control	Quasi-experimental	Emotion regulation and self-efficacy scales	ACT improved self-efficacy; EFT better for emotion regulation.	ACT and EFT both effective; ACT better for self-efficacy.	Yes

These ten studies reached a synthesis clearly showing that the Acceptance and Commitment Therapy (ACT) approach is effective in diabetes type 2 in adults, also providing an improvement in different types of psychological and clinical outcomes such as the reduction of diabetes distress, an improvement in the self-efficacy, the self-care behaviors, and the glycemic control. Compared to the apparently overwhelming results in favor of such an intervention in terms of reducing HbA1c levels, highlighted by multiple randomized and controlled trials, meta-analyses and even pilot studies, the effect sizes of ACT interventions regardless of whether administered in-person, online or integrated into a whole program, were moderate to large across the above-highlighted studies. Though ACT was compared with other approaches in the treatment of behavior disorders in some studies such as ABERT or emotion-focused therapy; ACT has displayed great benefit and can be applied under different conditions; therefore testifying to its implementation in the management of chronic diseases in cases of type 2 diabetes.

TABLE 5: *RESULTS INDICATING THEMES, SUB-THEMES, TRENDS, EXPLANATION, AND SUPPORTING STUDIES*

Themes	Sub-Themes	Trends	Explanation	Supporting Studies
Psychological Outcomes	Diabetes Distress Reduction	Decreasing trend post-intervention	ACT effectively reduces emotional burden and distress related to diabetes management by promoting acceptance and mindfulness skills.	Ngan et al., 2023; Maghsoudi et al., 2019; Guo et al., 2022; Wang et al., 2024
	Improvement in	Increasing psychological	Participants showed enhanced ability to accept	Kılıç et al., 2023; Wang et

Physiological Improvements	Behavioral Self-Management	Psychological Flexibility	flexibility scores	internal experiences and stay committed to diabetes-related goals.	al., 2024; Roja et al., 2023
		Resilience and Well-being	Improved emotional resilience and mental well-being	ACT helped improve participants' ability to cope with stress, contributing to higher psychological resilience and general well-being.	Hosseini et al., 2021; Khashouei et al., 2016
		Self-Care Behaviors Improvement	Increase in exercise, foot care, and general self-care	ACT interventions led to measurable behavioral changes in daily diabetes management routines.	Ngan et al., 2023; Hajati et al., 2024; Wang et al., 2024
		Diabetes Management Self-Efficacy	Enhanced self-efficacy confidence levels	Participants developed greater confidence in their ability to manage their diabetes through consistent practice of ACT strategies.	Roja et al., 2023; Khashouei et al., 2016; Chen et al., 2021
		Glycemic Control (HbA1c Reduction)	Moderate improvement in HbA1c levels	ACT interventions, particularly when paired with standard care, led to clinically significant reductions in blood glucose levels.	Hajati et al., 2024; Wang et al., 2024; Chen et al., 2021

Intervention Delivery	Online vs In-person ACT	Mixed feasibility and retention in online formats	While online ACT shows promise, adherence and retention were challenges that require adaptations to delivery and engagement strategies.	Kılıç et al., 2023
	ACT vs Other Interventions	Comparable or superior in several outcomes	ACT performed equally or better than mindfulness, emotion-focused therapy, or other psychological models in managing diabetes-related psychological and behavioral factors.	Hajati et al., 2024; Roja et al., 2023; Hosseini et al., 2021
Therapy Comparison				

The findings of the ten studies examined in the review were that Acceptance and Commitment Therapy (ACT) had a significant positive effect on the psychological and behavioral outcomes in adults with type 2 diabetes and the outcomes showed a decrease in diabetes distress, increase in psychological flexibility, increase in self-efficacy, and self-care behaviors. Some believed also that there was a moderate advancement in glycemic control {HbA1c levels}, especially when ACT was administered during several sessions that were consistent and combined with diabetes educations. Although both online and real-life versions were successful, better retention and engagement were found in structured interventions, led by the therapist, which shows the potential of ACT when managing diabetes holistically.

DISCUSSION

In the literature reviewed, it can be demonstrated that Acceptance and Commitment Therapy (ACT) is a significant addition to the psychological well-being of adults with diabetes type 2 as it improves the level of diabetes distress and increases the level of psychological flexibility. Research like those conducted by Ngan et al. (2023) and Maghsoudi et al. (2019) demonstrated that emotional acceptance and mindfulness promoted by ACT-based intervention are very important in ameliorating emotional burden with chronic illness. It is a psychological change that allows people to better follow their self-care objectives and their regimes of managing diabetes.

Regarding the behavioral changes, ACT was noted to have a positive effect in self-management of diabetes, such as taking medications, physical exercises, and food management. As an example, the results of a study by Hajati et al. (2024) and Wang et al. (2024) dwell upon the fact that breaching participants to ACT interventions showed significant results in terms of improvements of their diabetes-related self-care activities as opposed to control or usual care groups. These psychological gains are due to the behavioral analysis dealing with restructuring the personal values with a view of anchoring on health capabilities that make the patients devote to the life changes that can last a long time.

Another common outcome that was observed in most studies was glycemic control especially as quantified using HbA1c levels. Although the outcomes differed, various RCTs including the study by Chen et al. (2021) and Wang et al. (2024) found positive, though statistically insignificant improvement in HbA1c levels among the study members receiving ACT interventional practice. This favours the position that psychological treatment may correct physiological outcomes indirectly, as far as the adherence and motivation of the subject is heightened by focusing on the acceptance and commitment processes.

Additionally, research, such as the ones conducted by Kılıç et al. (2023) and Guo et al. (2022), has examined new forms of ACT programs, e.g., online and nurse-led ACTs, demonstrating or showing its feasibility, but in need of a stronger implementation, which could enhance the engagement and retention of participants. Online interventions are more accessible albeit in underserved locations, the completion rates tend to be lower and the therapeutic alliance is not that strong as with the conventional face-to-face interventions. These data indicate the necessity to find a way of optimizing digital interventions without lowering effectiveness.

When analyzed in a comparative method, incorporation into other learning or treatment programs, including diabetes education or self-compassion training, was one of the major strengths supported by several studies. The use of such hybrid strategies, according to Ngan et al. (2023) and Roja et al. (2023), yielded higher satisfaction rates among the participants and better results. It means that ACT can be used best when it is included into a complex intervention considering emotional regulation and practical management of the disease.

Finally, the comparative trials, such as the one by Hosseini et al. (2021) and Hajati et al. (2024), prove that although ACT is effective, alternative therapies, such as mindfulness-based stress reduction or acceptance-based emotion regulation therapy, can provide an equivalent component of success in specific areas or even outcompete the ACT. This stresses the necessity of a personal treatment plan in any treatment of type 2 diabetes through the psychological path of care, and ACT is only one of many evidence-based forms that may be customized to an individual.

FUTURE DIRECTION

Future studies shall aim at doing large scale, multi-site randomized controlled trials with more follow ups to determine the long-lasting impact of ACT on glycemic control, psychological results, and alteration in behavior. The cost-effectiveness of the ACT

interventions should be also examined, as well as the models tailored to various cultures of different populations, creation of digitalized forms of the platforms that would guarantee their accessibility and involvement on the part of people with diverse socioeconomic backgrounds.

LIMITATIONS

In spite of the encouraging results, all the reviewed studies also harbor a number of limitations, such as studies were conducted using small sample sizes, contained limited follow-up periods, and had heterogeneous intervention protocols, which influence the outcome generalizability. There were also issues with outcome measurement differences and inconsistency of ACT delivery types between studies that make comparison of efficacy difficult. Others trials particularly trials using an online format also had high drop-out rates, which again could bias the data on the outcome.

CONCLUSION

To conclude, the trial demonstrates that Acceptance and Commitment Therapy has high potential of being a functional psychological therapy in treating adults with type 2 diabetes, not only on the emotional but also the behavioral aspects of managing diabetes. Although the ACT does not directly focus on glycemic control, its effects on psychological flexibility, reductions of distress and self-care behaviors play a supporting role to improved health outcomes indirectly. Further development, and packetization of ACT-based interventions, may be important elements of whole life diabetes management.

AUTHOR CONTRIBUTIONS

The lead author took charge of conceptualization, overall design of the study as well as data curation, formal analysis and methodological framework. The author carried out the whole research, gathered all the needed resources and validated the data. It was entirely up to her to write the initial version of the manuscript and subsequently do extensive revisions and editing of the final product to be sent out to be published.

AUTHOR CONTRIBUTION

The conceptualization, methodology, data and fact analysis, data and fact interpretation, and writing, i.e., original draft preparation and final revision thereof were done by the author themselves.

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CONFLICT OF INTEREST

The author asserts that she has no commercial or financial interests.

EDITORIAL DISCLOSURE

This research adhered to all the ethical principles as set by the Pakistan Journal of medical and Cardiological Research.

PUBLISHER'S NOTE

Opinions, judgments, and interpretations presented are nowhere near the opinions, judgments, and interpretations of corporations, affiliated institutions, or the publisher to which the author is affiliated. The journal does not prescribe any product claims.

SUPPLEMENTARY MATERIAL

Data tables, review tools, and other supplementary materials are provided to ensure transparency and are available in the future.

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