

# Evaluating the effectiveness of a novel form of online Cognitive Behavioural Therapy for patients with type 2 diabetes and comorbid anxiety or depression



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## Problem

- It is estimated that 25% of patients with diabetes have comorbid depression<sup>1</sup>, and 40% have comorbid anxiety<sup>2</sup>
- Comorbid mental health problems in patients with diabetes are associated with poorer quality of life<sup>3,4</sup>, poorer diabetes management<sup>5,6</sup>, and even decreased lifespan<sup>7</sup>.

## Study aims

Test the effect of a novel online Cognitive Behavioural Therapy (CBT) tailored for patients with type 2 diabetes in reducing mental health symptoms, and improving patient engagement with self-management of their diabetes

## Methods

- 102 patients with type 2 diabetes and a mental health disorder were given a course of a novel CBT-based intervention, based on Acceptance and Commitment Therapy (ACT) principles

- The intervention was delivered by accredited therapists over the internet, using text, and following a diabetes-specific treatment protocol
- A pre-post study design explored the following outcome measures pre- and post-treatment, and at 6 months follow-up:
  - Depressive symptoms (PHQ-9)
  - Anxiety symptoms (GAD-7)
  - Diabetes distress (DDS)
  - General and diabetes related quality of life (ADDQoL)
  - Self-management of diabetes or patient activation (PAM)
- Synthetic control arms derived from real-world health service data were used to benchmark clinical outcomes (Table 2)

## Conclusion

This study shows that integrated approaches for mental healthcare in diabetes patients can significantly improve not only mental health outcomes, but also self-management of diabetes, quality of life, and reduce diabetes distress.

## Results

Intervention resulted in a statistically significant improvement pre- to post-treatment in all outcome measures (Table 1)

Improvements in depressive and anxiety symptoms, and diabetes distress were maintained at 6-months follow-up (Table 1)

There was statistically significant improvement in patients' self-management of diabetes, with the proportion of patients at the lowest level

of activation decreasing from 44.1% to 23.5%, pre- to post-treatment, and half of patients increasing by at least one level of activation

The proportion of patients at the highest level of activation increased from 1.0% to 17.7%

Results show higher drop in mental health scores in study group relative to all benchmark groups (Table 2)

Table 1 — Changes in outcome measures from pre- to post-treatment and at 6-months follow-up

	MEAN PRE-TREATMENT SCORE (N=102)	MEAN POST-TREATMENT SCORE (N=102)	P-VALUE (PRE-POST TREATMENT)	MEAN 6-MONTHS FOLLOW-UP SCORE (N=34)	P-VALUE (PRE-TREATMENT TO FOLLOW-UP)
PHQ-9	15.1	6.7	<.001 ***	10.2	<.001 ***
GAD-7	11.1	5.3	<.001 ***	7.6	<.001 ***
DDS	3.40	2.46	<.001 ***	2.83	.002 **
ADDQoL	-2.92	-2.47	.004 **	-2.02	.166
PAM	50.5	58.9	<.001 ***	56.5	.089

Table 2 — Comparison of change in mental health scores pre-post treatment between study group and benchmark groups

	STUDY GROUP (N=102)	BENCHMARK 1 (N=102)		BENCHMARK 2 (N=102)		BENCHMARK 3 (N=102)
	<ul style="list-style-type: none"><li>• Diabetes-specific online CBT</li><li>• <b>Type 2 diabetes</b></li><li>• Concomitant mental health disorder</li><li>• <b>Therapists specially trained</b></li></ul>	<ul style="list-style-type: none"><li>• Standard online CBT</li><li>• <b>Type 1 or type 2 diabetes</b></li><li>• Propensity-matched to study group by age and pre-treatment symptom severity</li></ul>		<ul style="list-style-type: none"><li>• Standard online CBT</li><li>• <b>Any long term physical condition, not exclusively diabetes</b></li><li>• Propensity-matched to study group by age and pre-treatment symptom severity</li></ul>		<ul style="list-style-type: none"><li>• Predicted outcomes for the study group, based on symptom severity and demographic data</li><li>• <b>Predictive model built on data from 11,000+ patients receiving standard online CBT</b></li></ul>
	Pre-post treatment change	Pre-post treatment change	P-value	Pre-post treatment change	P-value	Predicted pre-post treatment change
PHQ-9	8.4	6.0	.005 **	5.8	.003 **	7.2
GAD-7	5.9	4.5	.075	3.8	.006 **	4.8

<sup>1</sup> Ascher-Svanum et al. (2015) Diabetes Therapy; <sup>2</sup> Grigsby et al (2002) Journal of Psychomatic Research; <sup>3</sup> Baumeister et al (2011) Psychotherapy and Psychosomatics; <sup>4</sup> Feng & Astell-Burt (2017) Diabetes Therapy; <sup>5</sup> Trief et al. (2014) Diabetes Care; <sup>6</sup> Trief et al. (2019) Diabetes Care; <sup>7</sup> Egede et al. (2005) Diabetes Care;