Cognitive behavioural therapy for adherence and sub-clinical depression in type 2 diabetes: a randomised controlled trial (abridged secondary publication)

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KEY MESSAGE

Cognitive-behavioural intervention for both adherence and depression significantly reduced depressed symptoms and diabetes mellitus (DM)–related distress as well as significantly increased glycaemic control and self-care. Higher effect sizes were observed for DM-specific measures with reference to glycaemic control, adherence, and DM-related distress. The significance of distress and the possibility of reducing it highlighted the importance of managing emotions in diabetes care.

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Introduction

In patients with diabetes mellitus (DM), even subclinical levels of depressive symptoms and emotional distress are associated with non-adherence to DM self-care. Cognitive-behavioural intervention (CBT) has been reported to be effective in treating depression, but its effect on glycaemic control and adherence is mixed. Treating depression alone may not result in changes in health behaviours and therefore a more integrative approach is necessary.[1] In patients with unipolar depression and uncontrolled type-2 DM, CBT for both adherence and depression has shown to be effective in improving adherence, depression, and glycaemic control. We aimed to evaluate the efficacy of CBT for adherence and depression in reducing depressive symptoms and enhancing glycaemic control as well as in reducing DM-specific distress and enhancing adherence, self-care, perceived control, and health-related quality of life among adults with DM and subclinical depression.

Method

Community-dwelling patients with type-2 DM aged <70 years who were independent in activities of daily living (based on the Barthel Index) and scored 5 to 9 on the Patient Health Questionnaire Depression Scale were invited to participate. Those excluded were those who had major depression within the past 6 months, a lifetime history of other psychiatric disorders (including psychosis, schizophrenia, and bipolar affective disorder), serious suicidal risk, alcohol or substance abuse, medical illnesses with prognosis of <12 months to live, already taking medication or receiving psychological intervention for depressive disorders or related symptom, bedridden, memory loss, not being able to understand or communicate in Chinese language, or refusing to give consent.

Participants were randomly assigned to receive CBT for adherence and depression or enhanced treatments as usual. Based on the protocol in a study,[1] all participants received one session of brief discussion about patient-generated reasons for engaging in treatment and eleven cognitive and behavioural steps to adherence (eg, setting a daily schedule, having reminder cues for medications, getting to appointments). A psycho-education pamphlet was distributed, with four components: nutrition, preventing complications and self-care, emotion and stress management, and lifestyle.

The CBT consisted of eight weekly sessions of face-to-face group intervention followed by four weekly consolidation individual telephone calls and three monthly individual follow-up calls. Each group session lasted for about 2 hours. The four module themes included introduction to CBT for adherence and depression and self-care, behavioural activation and activity scheduling, thought monitoring and cognitive restructuring, and problem solving, relaxation training, and relapse prevention. The

four weekly individual telephone calls (each lasted for about 20 minutes) were used to review and consolidate the four module themes. Participant was asked to monitor, review, and revise each component to help incorporate them in the daily routines. The three monthly follow-up calls were delivered in the same manner to review and consolidate the four module themes.

In the enhanced treatments as usual group, participants received 20-minute weekly individual phone calls for 3 months, followed by three monthly calls. Simple and general verbal support was given to remind participants of referring to the psycho-education package and adherence issues. Regular bi-weekly supervision was carried out, subjected to participant approval. About 60% of sessions were recorded. Fidelity ratings of 90% to 95% were obtained by independent raters.

Participants were assessed at baseline, upon completion of intervention, and at 24 weeks. The 21-item Beck Depression Inventory was used to assess cognitive, behavioural, and somatic symptoms of depression. For glycaemic control, the haemoglobin Alc level was calculated by averaging fasting and the three-hour post-prandial (after a 300-calorie breakfast) blood glucose levels obtained by finger-pricking using Accu Chek. Secondary outcomes included the summary of DM Self-care Activities Questionnaire, DM Distress Scale, Perceived Control Scale, Medication Possession Ratio, and 20-item Short-Form Health Survey.[2-5]

A previous study on CBT reported a large effect size (Cohen's d >0.6) for both depression and adherence. Assuming 20% attrition and 5% type I error, we estimated that 84 patients would be needed per arm to provide 80% power to detect a medium effect size (Cohen's d=0.33) on depression and adherence.

Results

A total of 168 participants were recruited and randomly allocated at baseline. Of them, 132 completed the assessment at 24 weeks, with the overall attrition rate being about 21%. Reasons for withdrawal included admission to hospital/residential care, other medical appointments, and change of commitment of caregivers. The two groups were comparable in terms of baseline characteristics.

In repeated-measures ANCOVA (group × time) tests, the effect sizes in terms of eta-squared ranged from 0.022 to 0.076. The reliability of scales ranged from 0.72 to 0.87. The intervention effects for the Beck Depression Inventory and glycaemic control were significant (Table).

Discussion

CBT for adherence and depression was effective in enhancing adherence and reducing depressive symptoms. Higher effect sizes were observed for DM-specific measures including the reduction of DM-specific distress and the gains in glycaemic control, self-care, and adherence. Although sub-clinical depression is important in the context of adherence, the underlying construct of emotional distress is a core construct to link subclinical

TABLE. Repeated-measures ANCOVA (group × time) tests for outcomes at baseline, upon completion of intervention, and at 24 weeks

Variable	Cognitive-behavioural intervention for adherence and depression			Enhanced treatments as usual			α	*F*	P value	ηp²
	Baseline	Upon completion of intervention	24 weeks	Baseline	Upon completion of intervention	24 weeks				
Beck Depression Inventory	13.29±8.30	8.54±5.59	8.63±5.49	12.10±6.31	10.54±5.17	10.92±4.93	0.87	9.23	0.029	0.053
Glycaemic control	7.22±0.79	6.52±0.69	6.81±0.74	7.17±0.67	6.86±0.77	7.09±0.65		7.79	0.001	0.108
Summary of Diabetes Mellitus Self-care Activities Questionnaire	33.31±7.12	39.93±3.99	38.08±4.81	32.35±5.82	35.17±3.85	34.70±3.72	0.85	12.92	0.001	0.167
Diabetes Mellitus Specific Distress Scale	35.57±16.74	24.58±9.79	28.77±10.40	31.96±13.03	29.59±9.96	30.18±10.83	0.83	6.19	0.003	0.091
Perceived Control Scale	5.81±1.08	6.43±1.05	6.36±0.88	5.85±1.38	5.78±1.01	5.88±1.17		6.07	0.003	0.090
Medical Possession Ratio	9.48±0.27	9.78±0.19	9.72±0.27	9.41±0.31	9.62±0.24	9.54±0.24		6.23	0.003	0.088
SF-20 Physical	48.14±10.59	50.22±12.76	50.23±13.60	46.84±9.10	46.70±8.73	47.18±8.87	0.86	4.28	0.016	0.060
SF-20 Mental	44.79±8.45	49.86±6.28	50.90±4.99	46.25±10.83	45.75±6.56	47.17±6.40	0.87	6.30	0.002	0.089
Body mass index	24.84±3.71	24.50±3.66	24.41±3.56	25.84±3.71	24.71±3.82	24.66±3.79		4.18	0.017	0.057
Systolic blood pressure	132.95±7.32	131.55±7.19	131.09±7.05	131.62±5.96	130.95±6.57	130.78±6.60		4.30	0.015	0.063
Diastolic blood pressure	76.69±3.68	76.64±3.59	75.72±3.51	75.95±3.46	75.63±3.79	75.46±3.80		3.87	0.023	0.057

depression and even major depressive disorder in the understanding of management of diabetes.[6] The concept of distress marks the continuous struggle of the person living with a chronic illness. Reducing the diabetes distress highlights the importance of managing emotions in regular diabetes care. Thus, regular screening and monitoring of levels of distress and depressive symptoms among particular patients with DM in the community is warranted. Enhanced medical-social collaboration between the hospital and community settings may provide regular psycho-social support to DM patients with distress and depressive symptoms.

Our study provides a basis for determining the effectiveness of the support group interventions in the healthcare system (in terms of reducing admission, hospitalisation, and healthcare cost) and in patients (in terms of reducing complications and enhancing self-care). Further research on diverse age-groups (including younger participants) is warranted.

Conclusion

CBT for adherence and depression was effective in enhancing adherence and reducing depressive symptoms. Higher effect sizes were observed for DM-specific measures.

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