

## Appendix 1 Description of different approaches of the MBIs used in adults with diabetes

Approaches of the MBIs	The target population when it was originally designed	Treatment Principle
Mindfulness-based cognitive therapy (MBCT) <sup>1</sup>	Designed for adults with a history of recurrent depression	Participants learn to dis-identify with negative emotions and thoughts and to experience them as passing mental events. The process is characterized by the following stages: paying attention to the present moment, becoming aware of bodily sensations, emotions and thoughts and their inter-relatedness, acceptance of these experiences, and recognizing ineffective patterns and changing these patterns. Participants learn how to disengage from depression-related and ruminative thoughts in order to prevent future episodes of depression.
Mindfulness-based stress reduction (MBSR) <sup>2</sup>	Developed to reduce psychological morbidity associated with chronic illnesses and to treat emotional disorders.	The participants are trained through meditation exercises that have been adapted from Buddhist traditions, it is 'the awareness that emerges through paying attention on purpose, in the present moment, and non-judgmentally to the unfolding of experience moment by moment', to observe emotions, sensations, or cognitions. MBSR includes three mindfulness meditation practices - the body scan, which involves 'sweeping' through the body mentally from feet to head; mindfulness of breath and other perceptions; and Hatha yoga postures, designed to develop mindfulness during movement. MBSR can improve coping strategies, distress, resilience, emotional control, and fear of cancer recurrence.
Acceptance and commitment therapy (ACT) <sup>3</sup>	Developed for several disorders	ACT includes six core treatment processes of acceptance, defusion, contact with the present moment, self as context, values, and committed action to ameliorate a broad range of problems and increase motivation and reinforcement for meaningful behaviors. Initial sessions explored personal values in order to instill a

		sense of purpose and direction. The participants are helped to formulate their values as sources of satisfaction intrinsic to their own behavior, rather than as outcomes (e.g., achievement, praise) or in terms of negative reinforcement (e.g., escape from pain).
Dialectical behaviour therapy (DBT) <sup>4</sup>	Developed to treat chronically suicidal individuals and those who have borderline personality disorders.	DBT is to stabilize the clients and help them achieve behavioral control. The term dialectical conveys both the multiple tensions and the emphasis of enhancing dialectical thinking patterns to replace rigid, dichotomous thinking. DBT theorizes that the underlying problem to treat is pervasive emotion dysregulation, which leads to impulsive and maladaptive behaviors including self-directed violence and behaviors that are interpersonally destructive, as well as the inability to be dialectical and flexible in responding to life events.
Mindfulness-based self-compassion (MSC) <sup>5</sup>	Developed to treat mental disorders.	MSC stems from Buddhist Psychology which teaches both formal (sitting meditation) and informal (during daily life) self-compassion practices. MSC incorporates mindfulness as a core component while also attempting to encourage a sense of common humanity (recognizing that everyone goes through difficult times) and self-kindness (responding to one's suffering with gentleness and understanding instead of judgment and criticism). The goal is to provide participants with a variety of tools to increase self-compassion, which they can integrate into their lives according to what works best for them. It also teaches meditation practices aimed at developing compassion for self and others.

## References

1. Van Ravesteijn, H. J. , Suijkerbuijk, Y. B. ,et al. . Mindfulness-based cognitive therapy (mbct) for patients with medically unexplained symptoms: process of change. *Journal of Psychosomatic Research*, 2014;77(1), 27-33. doi:10.1016/j.jpsychores.2014.04.010.

2. Kabat-Zinn, J.. Full Catastrophe Living: Using the Wisdom of Your Body and Mind to Face Stress, Pain, and Illness. Dalacorte,1990; New York, NY.
3. Hayes, S. C. , Strosahl, K. D. , & Wilson, K. G.. Acceptance and commitment therapy:, an experiential approach to behavior change. Encyclopedia of Psychotherapy, 1999;9(1), 1–8.doi:10.1007/978-0-387-23369-7.
4. Linehan, M. M.. Cognitive-behavioral treatment of borderline personality disorder. Current Psychiatry Reports,1993;6(3), 225-231.doi:10.1007/s11920-004-0068-y.
5. Neff KJS, Identity. Self-Compassion: An Alternative Conceptualization of a Healthy Attitude Toward Oneself. 2003;2(2):85-101.

## Appendix 2 Search Example for Medline

1. exp Diabetes Mellitus/
2. diabet\*.tw.
3. (IDDM or NIDDM or MODY or T1D\* or T2D\*).tw.
4. (non insulin\* depend\* or noninsulin\* depend\* or non insulindepend\* or noninsulindepend\*).tw.
5. (insulin\* depend\* or insulindepend\*).tw.
6. or/1-5
7. exp Diabetes Insipidus/
8. diabet\* insipidus.tw.
9. 7 or 8
10. 6 not 9
11. Mindfulness/
12. mindful\$.tw.
13. Meditation/
14. meditat\$.tw.

15. MBSR.tw.
16. MBCT.tw.
17. Kabat Zinn.tw.
18. "Body Scan".tw.
19. "Soles of the Feet".tw.
20. mind-body therapies/
21. yoga/
22. yoga.tw.
23. tai ji/
24. (tai?ji or tai?chi or tai?qi).tw.
25. breathing exercises/
26. Qigong/
27. (ch?i kung or qi?gong).tw.
28. "Acceptance and Commitment Therapy".tw.
29. Dialectical Behaviour Therapy.tw.

30. or/11-19
31. exp Randomized Controlled Trial/ or "randomized controlled trial".ab.
32. exp Clinical Trials as Topic/ or RCT.ti,ab.
33. Systematic Review/ or. "systematic review" ti,ab.
34. Systematic Review as Topic/ or "system\* review\*". ti,ab.
35. Meta-Analysis/" or meta analysis".ti,ab.
36. exp Meta-Analysis as Topic/ or "meta analy\*".ti,ab.
37. or/31-36
38. 10 and 30 and 37
40. limit 38 to yr="2000-2019

## Appendix 3 With-group comparison of sub-analysis

Intervention	subgroup meta-analysis	n <sub>comp</sub>	Average effect size	95%CI	Z-value	P	I <sup>2</sup> (%)
Baseline DD levels of adults	An increased average DD score at baseline	286	0.48	-0.81,-0.15	2.82	0.005	46
	A normal average DD score at baseline	251	0.05	-0.34,0.44	0.24	0.81	56
MBIs principles	MBCT on diabetes distress	224	0.26	-0.69,0.16	1.23	0.22	52
	MBSR on diabetes distress	203	0.58	-0.86,-0.30	4.03	<0.0001	0
MBIs delivery (group vs. individual)	Group intervention	250	0.36	-0.68,-0.04	2.20	0.03	55
	Individual intervention	187	0.15	-0.70,0.40	0.55	0.58	68
The use of home practice	Assigning homework	305	0.42	-0.84,-0.00	1.98	0.05	65
	Not assigning homework	232	0.09	-0.54,0.35	0.40	0.69	64
Evaluation time points	Post-intervention effect on diabetes distress	456	0.17	-0.45,0.11	1.18	0.24	53
	3-month effect on diabetes distress	185	0.02	-0.27,0.31	0.15	0.88	0
	6-month effect on diabetes distress	187	0.56	-0.94,-0.18	2.91	0.004	39

Note: DD: diabetes distress; MBIs: Mindfulness-based interventions