

APPENDIX 14.S1: SUMMARIES OF EXPERIMENTAL RESEARCH CITED IN POSITIVE PSYCHOLOGY (PP) AND BUDDHISM

Table S1: Summaries of Mindfulness Studies

Citation	Country	Population	Design	N	PP Variables	Non-PP Variables	Key Findings
Carmody et al., 2008	USA	Adults	Uncontrolled study of the effects of MBSR on mindfulness, spirituality, psychological distress, and medical symptoms	44	Mindfulness Spirituality	Psychological distress Medical symptoms	Increases in mindfulness explained (mediated) increases in spirituality. Increases in both mindfulness and spirituality explained (mediated) decreases in psychological distress and medical symptoms.
Garland et al., 2007	Canada	Adult cancer patients	Nonrandomized controlled study of the effects of MBSR (vs. a creative arts program) on stress, mood, spirituality, and perceived posttraumatic growth in cancer patients	104	Perceived posttraumatic growth Spirituality	Stress Mood disturbance	Both groups showed evidence of increases in perceived posttraumatic growth. Relative to the creative arts program, MBSR led to larger increases in spirituality and greater decreases in anxiety, anger, stress, and mood disturbance.
Geary & Rosenthal, 2011	USA	Academic healthcare employees	Nonrandomized controlled study of MBSR vs. no-treatment control with 1-year follow-up	153	Well-being Daily spiritual experiences	Stress Medical and psychological symptoms	MBSR group showed gains in well-being and daily spiritual experiences and decreases in stress, and medical and psychological symptoms. The control group did not demonstrate meaningful change in these outcomes.
Goldberg et al., 2021	Various	Various	Systematic review of 44 mindfulness RCT meta-analyses	N/A	Well-being Mindfulness	Symptoms Pain Stress Physiology Sleep	Across most assessed problems, mindfulness interventions were superior to passive controls, with effects tending to persist across follow-up periods. Effect sizes were smaller when comparisons were made to active controls, with mindfulness-based approaches tending to be equivalently effective to comparative evidence-based treatments.
Henderson et al., 2012	USA	Women with early-stage breast cancer	Randomized controlled study of MBSR, nutritional education, and treatment-as-usual with a 2-year follow-up	172	Quality of life Spirituality Coping Meaning	Negative emotions Psychological symptoms	MBSR was more effective than the two control groups in promoting increased spirituality, enhanced meaning in life, and decreased negative mood. However, MBSR effects tended to fade across the 2-year follow up.
Ivtzan et al., 2016a	United Kingdom	Adults	Randomized controlled study of Mindfulness-Based Strengths Practice (MBSP; an online group) vs. no-treatment control	39	Life satisfaction Flourishing Signature strengths Engagement		MBSP participants showed significant improvement on measures of life satisfaction, flourishing, engagement, and signature strengths, whereas control group participants only improved on life satisfaction.

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Ivtzan et al., 2016b	United Kingdom Canada USA Australia	Adult educators, office workers and meditators	Randomized controlled study of 8-week online Mindfulness-Based Flourishing Program (MBFP) vs. waitlist control with 1-month follow-up	168	Well-being Gratitude Engagement Self-compassion Other-directed compassion Self-efficacy Meaning in life Autonomy Positive relations Mindfulness	Stress Depression	MBFP demonstrated superior effectiveness (relative to controls) in promoting increased well-being, gratitude, engagement, self-compassion, positive relations, meaning, and mindfulness, as well as decreased perceived stress and depression symptoms. Effects were low-to-moderate in size and persisted across the 1-month follow-up period.
Ivtzan et al., 2018	United Kingdom Hong Kong	Adults	Randomized controlled study of 8-week online Mindfulness-Based Flourishing Program (MBFP) vs. waitlist control	115	Mindfulness Affect Gratitude Self-compassion Meaning in life	Depression	MBFP demonstrated superior effectiveness (relative to controls) in promoting decreased negative affect and increased mindfulness, gratitude, self-compassion, and meaning in life, with large effect sizes. Similar results were found for the United Kingdom and Hong Kong samples.
Kristeller & Jordan, 2018	USA	Overweight adults	Randomized, controlled study of Mindfulness-Based Eating Awareness Training (MB-EAT) vs. waitlist control w/ 2-month follow-up	117	Spiritual meaning/peace Spiritual faith Mindfulness	Eating and emotional regulation Depression Anxiety	MB-EAT led to increased spiritual meaning/peace and spiritual faith. Increased mindfulness explained (mediated) increases in spiritual well-being, which in turn explained (mediated) decreases in depression, anxiety, and binge-eating.
Pang & Ruch, 2019	Switzerland	Adults	Randomized controlled trial of 8-week MBSR vs. waitlist control w/ 6-month follow-up	42	VIA character strengths Mindfulness		MBSR led to increased mindfulness and increased VIA strengths of love, appreciation of beauty, gratitude, and spirituality (and trends toward significant increases in zest and bravery), relative to control group participants.

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Table S2: Summaries of Self-Compassion and Lovingkindness Studies

Citation	Country	Population	Design	N	PP Variables	Non-PP Variables	Key Findings
Bluth et al., 2016	USA	Adolescents	Randomized waitlist control study of Mindful Self-Compassion (MSC) for teens	34	Self-compassion Life satisfaction	Depression	MSC led to decreased depressive symptoms and increased self-compassion and life-satisfaction.
Dundas et al., 2017	Norway	University students	Randomized waitlist control study of 2-week self-compassion training with 6-month follow-up	158	Self-efficacy Self-compassion	Negative thinking Anxiety Depression Impulse control	Relative to a waitlist control, self-compassion training led to increases in self-efficacy, impulse control, and self-compassion, as well as decreases in self-judgment, negative self-directed thinking, anxiety, and depression. Most improvements were maintained across the 6-month follow-up period.
Ferrari et al., 2019	Various	Various	Meta-analysis of 27 self-compassion randomized controlled trials (RCTs)	N/A	Self-compassion Mindfulness	Eating behavior Rumination Stress Depression Self-criticism Anxiety	Self-compassion RCTs showed large effects on eating behavior and rumination, and they showed moderate effects on self-compassion, stress, depression, mindfulness, self-criticism, and anxiety.
Fredrickson et al., 2008	USA	Corporate employees	Randomized waitlist control study of workplace lovingkindness training (LKM)	139	Positive emotions Mindfulness Environmental mastery Purpose Self-acceptance Positive relationships Life satisfaction		LKM led to increases in daily levels of amusement, awe, contentment, gratitude, hope, interest, joy, love, and pride, relative to controls. Higher levels of positive emotions explained (mediated) increases in mindfulness, environmental mastery, self-acceptance, purpose in life, and positive relationships, which in turn explained (mediated) increases in life satisfaction.
Fredrickson et al., 2019	USA	Adults	Randomized trial of 6-week mindfulness (MM) vs. lovingkindness (LKM) meditation workshops	217	Positive emotions (daily) Social integration	Negative emotions (daily) Formal and informal daily meditation practice	MM and LKM both led to increases in positive emotions and in perceived social integration. The amount of daily informal meditation practice correlated with higher levels of positive emotion and social integration.
Friis et al., 2016	New Zealand	Adults with Type 1 and Type 2 diabetes	Randomized wait list control study of 8-week Mindful Self-Compassion (MSC) training for diabetics w/ 3-month follow-up	31	Self-compassion	Depression Diabetes distress HbA1c (blood sugar)	Relative to controls, MSC led to increases in self-compassion and decreases in depressive symptoms and diabetes distress. MSC participants meaningfully decreased in HbA1c by 3-month follow-up, whereas controls did not.

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Citation	Country	Population	Design	N	PP Variables	Non-PP Variables	Key Findings
Galante et al., 2016	United Kingdom	Adults	Randomized controlled trial of 4-week online Lovingkindness Training (LKM) compared to a light exercise program	809	Well-being Life satisfaction Positive emotions Altruism Empathy Perspective taking	Depression symptoms Irritability Anxiety Stress Negative emotions	Because of high drop-out rates, only 18% of participants completed the programs. Almost all variables improved (for both LKM participants and controls), without meaningful between-group differences.
Hoge et al., 2013	USA	Adult meditators and nonmeditators	Naturalistic study of telomere length in populations of lovingkindness (LKM) meditators and nonmeditators	37		Telomere length	LKM practitioners had longer telomeres than nonmeditators. This finding only reached significance for women.
Leiberg et al., 2011	Switzerland	Adult women	Randomized study of lovingkindness training (LKM) vs. memory control training	69	Prosocial behavior Positive emotions Compassionate feelings	Negative emotions	Compared to controls, LKM led to increases in compassionate feelings and decreases in negative emotions. LKM also led to increases in prosocial behavior towards the avatar of an ostensible other player during videogame play.
Le Nguyen et al., 2019	USA	Adults	Randomized study of effects of Lovingkindness Meditation (LKM) training vs. Mindfulness Meditation (MM) training vs. waitlist control on telomere length	142	Positive emotions	Telomere length	Telomere length shortened significantly for waitlist controls and MM participants but not for LKM participants. There was significantly less telomere shortening in LKMs than controls, but MM participants did not significantly differ from either.
Neff & Germer, 2013	USA	Adults	Randomized, waitlist control study of 8-week Mindful Self-Compassion (MSC) training w/ 6- and 12-month follow-ups	52	Self-compassion Other-directed compassion Mindfulness Life satisfaction	Anxiety Stress Depression	Relative to controls, MSC led to increases in self-compassion, other-directed compassion, mindfulness, and life satisfaction, as well as decreases in stress, anxiety, and depression. These gains were maintained at 6- and 12-month follow-up.
Shahar et al., 2015	Israel	Self-critical perfectionistic adults	Randomized waitlist control study of lovingkindness meditation (LKM) training on self-criticism w/ 3-month follow-up	38	Self-compassion Positive emotions	Self-criticism Distress	Compared to controls, LKM led to increases in self-compassion and positive emotions, as well as decreases in self-criticism and psychological distress. Results were maintained at 3 months.
Sorenson et al., 2019	USA	Adults	Randomized controlled study of effects of 2-hour Lovingkindness meditation (LKM) vs. Classical Music LKM+ classical music interventions on well-being w/ 1-month follow-up	78	Well-being Mindfulness Self-compassion Other-directed compassion		All groups showed similar, small-sized improvements on the outcome variables. The amount of home practice was correlated with increases in mindfulness and self-compassion.

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Table S3: Summaries of Psychedelic Studies

Citation	Country	Population	Design	N	PP Variables	Non-PP Variables	Key Findings
Griffiths et al., 2008	USA	Adults	Randomized controlled study of effects of psilocybin vs. methylphenidate with 2-month and 14-month follow-ups	36	Positive affect Quality of life Actualization potential Mystical experience Transcendence Faith maturity Spiritual well-being Life satisfaction Altruism Positive behavior change	Negative affect Big Five personality traits	55% of the psilocybin group had a “complete” mystical experience. Psilocybin-induced mystical experiences resulted in increases in self-reported attitude, mood, well-being, life satisfaction, altruism, and positive behavioral change at 2 months, and these improvements persisted across the 14-month follow-up period.
Griffiths et al., 2011	USA	Adults	Randomized double-blind study of persistent effects of different dosages of psilocybin on attitude, mood, and behavior w/ 14-month follow-up	18	States of consciousness Mystical experiences Death transcendence Positive attitude Positive mood Altruism Spirituality Positive behavior change	Anxiety Delusions	At the highest psilocybin doses, 72% of participants had complete mystical experiences. 94% of participants rated these experiences among the five most spiritually significant experiences of their lives. Participants reported persisting positive changes in attitude, mood, life satisfaction, behavior, and altruism.
Griffiths et al., 2018	USA	Adults	Randomized controlled study of effective vs. placebo doses of psilocybin in subjects with high vs. low support for daily spiritual practices with 6-month follow-up	75	Mystical experiences Faith maturity Religious coping Daily spiritual experiences Death transcendence Gratitude Forgiveness Sanctification of striving Optimism Purpose in life Life satisfaction Positive emotions Positive attitudes Nonattachment	Big Five personality traits	Psilocybin led to increases in self-rated positive moods and attitudes, faith maturity, religious coping, daily spiritual experiences, death transcendence, gratitude, and meaning, compared to placebo controls. These changes persisted across the 6-month follow-up period. High support for daily spiritual practice (meditation, mantra, journaling) in the psilocybin group led to bigger changes on these variables, as well as changes in sanctification of strivings, forgiveness, and observer-rated positive behavioral changes.
Groff et al., 1973	USA	Adult cancer patients	Uncontrolled study of effects of psychedelic-assisted psychotherapy (with LSD or DPT) on staff and family ratings of patient symptoms	60		Depression Isolation anxiety Difficulty coping Pain Death anxiety	Average improvement occurred on all psychological measures. 29% of participants showed dramatic improvement, 41.9% showed moderate improvement, 22.6% were unchanged, and 6.4 % deteriorated.

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McLean et al., 2011	USA	Adults	Analyzed data from previous randomized controlled studies of psilocybin vs. methylphenidate to assess personality change	52	Mystical experience States of consciousness	Big Five personality traits	Psilocybin increased trait openness to experience. Completeness of mystical experiences correlated with increased openness to experience. Changes in openness to experience persisted across the 14-month follow-up period.
Pahnke, 1963	USA	Seminary students	Randomized study of effects of psilocybin vs. placebo administered in the context of a Good Friday religious service w/ 6-month follow-up	20	Unitive experience Transcendence Positive mood Feelings of love Sacredness Noesis Paradoxicality Ineffability Transiency Positive attitude Positive behavior	Disturbing changes in attitude/behavior	Psilocybin administered in a religious context induced transient mystical experiences marked by unity, transcendence, positive mood, love, noesis, paradoxicality, ineffability, and persisting positive changes in attitude and behavior.