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Project title: Compassion Cultivation Training (CCT): A preventive Intervention for caregivers of people who suffer from a mental illness

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28 people who suffer from a mental illness

29

30 **Background:**

31 The caregivers of people who suffer from mental illness are at raised risk for mental health difficulties
32 (Sorrell, 2014, Stansfeld, 2014, Clark et al., 2011) such as depression, stress and anxiety. Physical
33 health can also be problematic (Clark et al., 2011). In Denmark alone, there are approximately 1.6
34 million who categorize themselves as caregivers of someone with a mental illness. Of those caregivers,
35 a small, but significant, proportion provides care to a person with a mental illness for 15 hours per
36 week or more (Bedre Psykiatri (Better Psychiatry)).

37 Informal caregiving has come about, as a result of people living longer, and the deinstitutionalization of
38 the health care system. The formal care that once was provided by nurses and other healthcare
39 personnel has now, to a large degree, been given to family members. Caregivers become “hidden
40 patients” who are struggling with their own psychological and physical health as well as providing care
41 for someone with mental illness (The Lancet Editorial, 2017).

42 A study demonstrated that 25-50% of caregivers develop depression (Clark et al., 2011). If these
43 figures can be translated to the Danish context, 40.000 – 80.000 Danes can be expected to develop
44 depression as a direct result of caring for a loved one with mental illness. A 2012 analysis of National
45 Statistics from Eurostat demonstrates, that the direct and indirect costs per person with depression in
46 Europe is €3034 (Olesen, et al., 2012). Consequently, it is estimated that the cost to Danish society
47 related to the increased incidence of depression among caregivers of the mentally ill amounts to
48 between 120 – 240 million Euros. Det Nationale Forskningscenter for Arbejdsmiljø (The National
49 Research Center for Work Milieu) estimate that the total direct and indirect costs due to mental health
50 related issues in Denmark are 55 billion Danish kroner annually (Danish Mental Health Fund, 2017).
51 Together, these findings provide impetus to study interventions to support caregivers, particularly
52 preventive interventions that increase their psychological and physical health, thereby decreasing the
53 economic burden on society (Jacobsen, 2011).

54

55 There is a call for research-based interventions for caregivers (Northouse et al., 2010). Systematic and
56 meta-analysis reviews of intervention programs for caregivers have found conflicting evidence for the
57 effectiveness of interventions programs (Knight et al., 1993) stating that there were too many
58 interventions and too little information on what mechanisms within the interventions were helpful.
59 Others suggest that interventions that specifically address the needs of informal caregivers lead to
60 improvements in their quality of life, a decrease in burden and psychological distress (Yesufu-
61 Udechuku et al., 2015, Northouse et al., 2010). Sörensen et al., (2002), concluded “interventions are on
62 average, successful in alleviating burden and depression, increasing general subjective well-being, and
63 increasing caregiving ability/knowledge. To our knowledge, no preventive interventions aiming at
64 providing caregivers with the skills necessary to increase their emotional resiliency to the caregiver
65 burden have been applied in Denmark.

66

67 **Compassion training research:**

68 There is a strong and growing interest in the scientific community to explore how compassion is
69 trained, defined, measured and implemented into various settings (Kirby, 2016). Clinical scientists are
70 examining the impact compassion training has on emotional experience, emotion regulation, and
71 psychological flexibility” (Goldin & Jazaieri, 2017). Thus far, research on compassion training point to
72 the potential of being a tool to enhance and sustain mental and physical health (Goldin & Jazaieri,
73 2017, Kirby, 2016, Hoffman et al., 2011). A systemic review on the impact of compassion training on
74 the treatment of psychopathology the authors concluded that compassion interventions may be effective
75 in treating a broad array of mental health issues such as improvement in psychological distress, levels
76 of positive and negative affect, the frequency and intensity of positive thoughts and emotions, empathic
77 accuracy, and interpersonal skills (Shonin et al., 2015). Another review found that compassion training
78 was associated with reduction in stress and subjective distress, increased immune response, and
79 improvements in the activation of brain areas that are involved in processing emotions and empathy
80 (Hoffman et al., 2011).

81 Studies on compassion training further found that feeling compassionate decreased heart rate and
82 feeling distressed increased heart rate (Gu et al., 2017), and that displaying compassionate concern for

83 others lowered cortisol reactivity and blood pressure, increased heart rate variability, allowed
84 participants to receive greater support from others, and increased participant's positive affect (Cosley et
85 al., 2010). Other studies have found that a brief compassion exercise increased feelings of social
86 connection and positivity towards strangers (Hutherson et al., 2008).

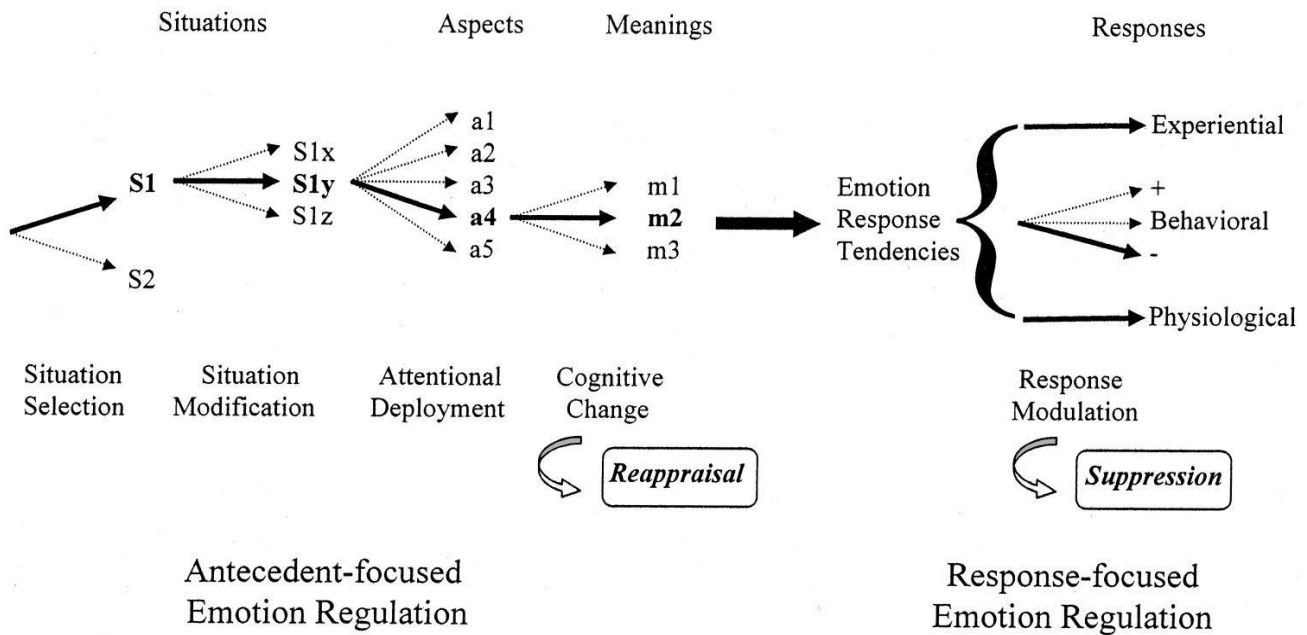
87 Klimicki et al., (2014) found that the participants receiving empathy training showed brain activation in
88 areas associated with pain and empathy and when the same participants afterwards received
89 compassion training the effects reversed not only by strengthening their positive affect but also by
90 activating brain areas associated with affiliation and love. This research suggests that being exposed to
91 the suffering of others may lead to two different and distinct emotional reactions: 1) *empathetic*
92 *distress*, which when being exposed to empathetic distress over a long period of time, (such as loved
93 ones suffering from a mental illness) negative feelings and withdrawal emerge and give rise to negative
94 health outcomes, and 2) *compassionate response* that is based on other-oriented and positive feelings
95 and activates pro-social motivational behavior. In sum, this body of research suggests that compassion
96 training may benefit our mental and physical health by improving emotion regulation skills,
97 interpersonal and social relationships, and by activating our parasympathetic system which aims to
98 soothe and calm thereby promoting better physical health.

99 **Compassion Cultivation Training (CCT):**

100 Compassion is often defined as the feeling that arises when we witness someone suffering and we feel
101 motivated to help the person who is suffering (Goetz et al., 2010, Kirby, 2016). Compassion
102 Cultivation Training (CCT) is a comprehensive compassion training program, with a dialectical focus
103 on training compassion for one's own suffering and the suffering of others (including a loved one, a
104 stranger, a difficult person, and all living beings). While the foundation of compassion training is
105 rooted in mindfulness (the paying attention to the present moment without judgment), the focus within
106 compassion training is to notice and pay attention to the suffering within oneself or others thereby
107 becoming motivated to relieve that suffering. The CCT program trains a variety of skills and techniques
108 for emotional and mental well-being and is designed to promote qualities of compassion and empathy,
109 and to cultivate kindness towards self, others and difficult people (Goldin & Jazaieri, 2017).

110

111 The theoretical model used in this study is the Process Model of Emotion Regulation developed by
 112 Gross & John (2003). Underlying this model is a conception of an emotion-generative process. This
 113 conception considers that emotions start with an evaluation of emotion cues. When the emotion cue is
 114 attended to and evaluated in different ways, the emotion cues then set in motion a coordinated set of
 115 responses that include experiential, physiological and behavioral systems. When the response
 116 tendencies arise, they may be regulated in different ways (Gross & John, 2003).
 117



118
 119 Reprinted from “Emotion Regulation in Adulthood: Timing Is Everything,” by J. J. Gross, 2001,
 120 *Current Directions in Psychological Sciences*, 10, p. 215. Copyright 2001 by Blackwell Publishers.
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122 According to the model, emotions can be regulated at five points: 1) selection of the situation, 2)
 123 modification of the situation, 3) deployment of attention, 4) change of cognitions, and 5) modulation of
 124 the experiential, physiological, and behavioral responses (Gross & John, 2003).

125
 126 The first four responses are *antecedent-focused*: Things we do before an emotion response tendency
 127 has become fully activated and has changed our behavior and physiological response. The fifth
 128 response is *response-focused*: Things we do once an emotion is already in process and after the

129 response tendencies have already been created (Gross & John, 2003). One such response- focused
130 strategy is emotion suppression and can be used as an emotion regulation strategy when faced with
131 difficult emotions.

132

133 In a study by Gross & John (2003), emotion suppression in participants produced feelings of
134 inauthenticity, masking of inner feelings, confusion about what they were feeling, less successful at
135 mood repair, viewed their emotions less favorably and accepting, experienced more negative emotions
136 and less positive emotions, more reluctant to share how they felt with others and avoided close
137 relationships (Pendry & Wright, 2016). The application of this theory to compassion training is that in
138 training caregivers' ability to regulate and accept difficult thoughts and emotions will allow for less
139 emotion suppression and greater acceptance of their own emotional responses, leading to a decrease in
140 overall psychological distress.

141

142 Current research on CCT:

143 Preliminary research findings on CCT have yielded several results: 1) increases in compassion for
144 others and decreases in fear of compassion for self and others, 2) home meditation practice predicted
145 CCT related changes such as a decrease in worry, 3) significant changes in emotion experience such as
146 increased positive affect, decreased negative affect and perceived distress, 4) significant changes in
147 emotion regulation such as increased cognitive reappraisal and acceptance and decreased suppression
148 of emotion, 5) significant changes in cognitive regulations such as increased mindfulness skills,
149 decreased negative rumination and mind-wandering (Jazaieri et al., 2013, 2014, 2015).

150

151 Results further indicate that when 1) participants have practiced a compassion meditation that same
152 day, the probability of the participant having an other-focused caring behavior increase by 3.5 times, 2)
153 having practiced a compassion meditation that same day increase the probability of self-caring
154 behavior by 6.5 times, and 3) having engaged in self-care behavior that day participants are 9.3 times as
155 likely to engage in an other-care behavior (Goldin & Jazaieri, 2017). Research on women with chronic
156 pain receiving the CCT course found reduced pain severity and anger, and increased acceptance of pain
157 (Chapin et al., 2014).

158

159 Two 2017 studies on the effects of CCT demonstrated significant improvements on self-compassion,
160 mindfulness, and interpersonal conflict (Scarlet et al.), increased skills in regulating affective
161 experiences while simultaneously shifting towards not influencing affective states, indicating that
162 participants of the CCT program may be more willing or able to accept their difficult emotions instead
163 of suppressing or avoiding them allowing them to become self-efficacious in promoting acceptance of
164 their affective experience (Jazaieri et al., 2017). Thus far, CCT has been studied in the general
165 population, in people with chronic pain, and health care professionals (Jazaieri, 2013, 2014, 2015,
166 2017, Chapin et al., 2014, & Scarlet et al., 2017). The research on the CCT program is promising, yet
167 more rigorous trials are needed to assess the effectiveness and utility of compassion interventions
168 (Kirby, 2016).

169

170 The literature on interventions for caregivers along with compassion training suggests that the different
171 components of psycho-educational group processes, training in compassion and mindfulness alongside
172 meditation and dyadic exercises, may be helpful components in decreasing psychological distress,
173 increase well-being and social connectedness (Hutcherson et al., 2008, Kok & Singer, 2016). The CCT
174 program may be a helpful preventive intervention for caregivers of the mentally ill. Therefore, this
175 study is of high value as it aims to bring skills to a “hidden” group within the Danish population of
176 informal caregivers so that they may be better equipped to take care of their own emotional health. The
177 skills they will acquire through the CCT course may allow caregivers greater flexibility in regulating
178 emotions and greater acceptance of difficult emotions, increasing their emotional resiliency and
179 decreasing psychological distress. This will not only benefit themselves and their loved one suffering
180 from a mental illness but it will also benefit Denmark economically.

181

182 **Aim:**

183 This study will begin a novel line of research on CCT in Denmark as a preventive intervention for
184 caregivers of people suffering from a mental illness. The primary aim of the study is to investigate the
185 effectiveness of a Compassion Cultivation Training (CCT) course.

186 Hypothesis 1: It is hypothesized that caregivers in CCT will reduce psychological distress, relative to
187 control participants, as measured by the Depression Anxiety Stress Scale (DASS: Lovibond &

188 Lovibond, 1995) at baseline (T0), post intervention (T1), 3-month (T2) and 6-month (T3).

189 Hypothesis 2: It is hypothesized that caregivers in CCT, relative to control participants, will increase
190 overall well-being, compassion for self and others, resilience, mindfulness, and show greater
191 acceptance of difficult emotions and decrease emotion suppression perceived stress, as measured by
192 World health Organization Well-Being Index (WHO-5: Beck, 2012), Self-Compassion Scale Short
193 Form (SCS-12: Raes et al., 2011), Multidimensional Compassions Scale (MCS: Jazaieri et al., 2018),
194 Perceived Stress Scale, (PSS: Cohen et al., 1983), The Emotion Regulation Questionnaire (ERQ):
195 Gross & John, 2003), Five Facet Mindfulness Questionnaire (FFMQ-15: Baer et al., 2006) measured at
196 T0, T1, T2, and T3.

197 Hypothesis of Mechanisms: Improvements on these skills will mediate the effects of treatment and
198 outcome. Specifically: a) increase in compassion for self and others (SCS-12 and MCS) will mediate
199 the effects of emotion regulation skills (i.e. greater acceptance of difficult emotions and therefore less
200 suppression of difficult emotions) and b) increase in emotion regulation skills (ERQ) (i.e. greater
201 acceptance of difficult emotions and therefore less suppression of difficult emotions) will mediate the
202 effects of psychological distress (DASS) in informal caregivers.

203 **Methods**

204 **Research design**

205 The effect of CCT will be evaluated in a parallel randomised controlled trial including 77 participants
206 in the intervention group and 77 in a wait-list group.

207 **Participants and Recruitment:** Participants will be recruited through primary care physicians, the
208 national association for caregivers; Bedre Psykiatri, Landsforeningen for pårørende (Better Psychiatry,
209 national association for caregivers), through Psykiatrifonden (The Danish Mental Health Fund) and
210 through social media such as Facebook, Twitter, and the Danish Center for Mindfulness website. In
211 addition, recruitment will be carried out through CSV's website, local newspapers and their
212 collaborators. Participants who meet the inclusion and exclusion criteria will be recruited.

213 **Eligibility Criteria**

214 **Inclusion criteria:** a) caregiver male and female (parent /spouse/sibling/adult child) of a person with a
215 mental illness, b) 18 - 75 years of age, and c) Danish speaking.

216 **Exclusion criteria:** a) diagnosed and untreated mental illness, b) addictions, c) meditation practice
217 (studies have shown that people who are long-term meditation practitioners are more resilient and have
218 greater psychological well-being (Lykins & Baer, 2009). Therefore, people with 1 year or more of prior
219 formal meditation practice, will not be eligible for the study as we cannot rule out whether their scores
220 are due to their long-term practice or to the CCT intervention), d) or current psychotherapeutic
221 treatment.

222

223 **Randomization:** After informed consent and T (0) measures, participants will be randomized to either
224 CCT (N=77) or WLC group (N=77) using a computer algorithm with predefined, concealed random
225 numbers. An independent statistician will manage the randomization.

226

227 **Procedure:** Eligible participants, meeting all study criteria, are asked to participate in the RCT. All
228 participants will be given psychological, and demographic measurements at baseline (T0), and
229 psychological measures at post intervention (T1), 3-month follow-up (T2) and 6-month follow-up (T3),
230 The study will be registered in ClinicalTrials.gov before commencement. The investigators will
231 specifically ask that the participants in the WLC group do not start any other intervention during the
232 study period.

233

234 **Power:** The sample size was calculated using effect sizes from related publications (Kirby et al., 2017;
235 Jazaieri et al., 2015, 2013, 2012, Kuhlmann et al., 2015, Galante, et al., 2014, & Brito-Pons, 2014),
236 respective η -square-values, and Cohen's d) with G*Power. The power analysis gave an approximate
237 value of a minimum of 77 participants in both groups where we expect a medium effect size of .5
238 Cohen's d (alpha .05, power 80%). A minimum of 77 participants per group allows for an attrition rate
239 of 20%, which will give us a minimum sample size of 64 participants per group. Four groups of
240 approximately 20 participants per group will be given the CCT intervention.

241

242 **Measures**

243 **Primary psychological measures:**

244 **Depression Anxiety Stress Scales** (DASS: Lovibond & Lovibond, 1995). The DASS is a 42-item self
245 report instrument designed to measure the three related negative emotional states of depression, anxiety
246 and tension/stress.

247 **Secondary psychological measures:**

248 **The World Health Organization Five Well-Being Index** (WHO-5: Bech, 2012). The WHO-5 index
249 is a short self-reported measure of current mental wellbeing that consists of five statements, which
250 respondent's rate according to the 6-point Likert scale.

251 **Brief Resilience Scale** (BRS: Smith et al., 2008). The BRS is a 6-item scale assessing the ability to
252 bounce back or recover from stress.

253 **Perceived Stress Scale** (PSS: Cohen et al., 1983). The PSS assesses the perceived stress within the last
254 month. It is a 10 item self-report questionnaire using a 5 point-Likert scale

255 **The Emotion Regulation Questionnaire** (ERQ: Gross & John, 2003). The ERQ is a 10-item scale
256 designed to measure respondents' tendency to regulate their emotions in two ways: 1. Cognitive
257 Reappraisal and 2. Expressive Suppression. Respondents answer each item on a 7-point Likert-type
258 scale.

259 **Self-compassion Scale-12** (SCS-12: Raes et al., 2011). The SCS is a 12-item scale is designed to
260 measure respondent's level of self-compassion. Respondents answer on a 5-point Likert scale.

261 **Multidimensional Compassion Scale** (MCS, Jazaieri et al., in prep). The MCS scale is a general
262 measure of compassion with four components: Cognitive, affective, intentional, and motivational. The
263 scale is comprised of 16 questions and respondents answer on a 7-point Likert scale.

264 **Five Facet Mindfulness Scale-15** (FFMQ-15: Baer et al., 2006). The FFMQ is a 15-item scale
265 measuring mindfulness. Respondents answer on a 5-point Likert Scale.

266

267 **Process measures:**

268 **Working Alliance Inventory Short Form Revised** (WAI-SR: Horvath, A. O. (1981) & Tracey, T. J.,
269 & Kokotovic, A. M. (1989). The WAI-SR is a 12-item scale measuring three domains of the
270 therapeutic alliance. The WAI-SR is a patient-rated questionnaire. Patients rate items on a 5-point

271 Likert scale.

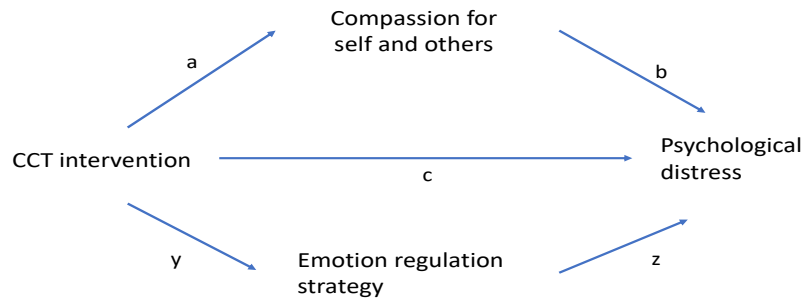
272 **Demographic baseline measures:** Age, gender, socio-economic status measured by educational level
273 and income, years of being an informal caretaker.

274

275 **Statistical Measures: 1)** We will compare the outcome variables (DASS, PSS, SCS-12, MCS, ERQ,
276 BRS, FFMQ-15, and WHO-5) correcting for multiple comparisons where appropriate using the Student
277 t or Wilcoxon tests. Analysis of covariance (ANCOVA) will be conducted to assess whether CCT is
278 related to changes between baseline and after 8 weeks of intervention in relation to psychological
279 distress. We will also use a random-effects repeated measures analysis to examine the impact of the
280 CCT intervention on psychological distress, adjusting for confounding variables (age, gender, socio-
281 economic status, and years as informal caretaker). The repeated measure analysis approach accounts
282 for the same individual's different outcome measures across different points in time without assuming
283 either linear or curvilinear growth pattern. Cronbach alpha's will be computed to determine the internal
284 consistency of our outcome measures.

285

286 The four measurement points allow to test whether changes in the proposed mediators are associated
287 with changes in the proposed outcomes. This is a crucial condition in order to investigate mediators and
288 possible mechanisms (Kazdin A.E., 2007). We will use structural equation modelling to examine the
289 proposed mechanisms of CCT by testing the following action theories and conceptual theories
290 simultaneously (Chen, H-T., 1994; Goldsmith et al., 2018). The current project assumes two conceptual
291 theories, which will be tested: 1) changes in compassion for self and others will affect psychological
292 distress (DASS) and 2) changes in emotion regulation skills of reappraisal and suppression (ERQ) will
293 affect psychological distress (DASS). The action theories, that CCT changes 1) compassion for self
294 (SCS-12) and others (MCS) and 2) emotion regulation skills of reappraisal and suppression (ERQ), will
295 be tested. The indirect, direct and total effects will be estimated with 95% CI inspired by a framework
296 suggested by Goldsmith et al., (2018). The statistical package M-Plus will be applied.



297

298 **Plan for dissemination:** Three research articles: 1) Mental Health interventions for caregivers of
 299 people with mental illness: A systematic review and meta-analysis, 2) CCT for Caregivers: A
 300 randomized controlled trial' and 3) 'Compassion for Caregivers: Can compassion be utilized as an
 301 emotion regulation strategy in decreasing psychological distress?'

302 **Perspectives:** It is paramount that preventive interventions for caregivers of mentally ill people are
 303 studied for their effectiveness and implemented, as it is widely known that these informal caregivers
 304 have a much greater risk of developing depression, anxiety, stress, and poor physical health. If the
 305 caregivers are not able to continue to care for their loved one, the detriment is not only to the caregiver,
 306 but also to the person being cared for. This proposal proposes a novel line of studying the effectiveness
 307 of a compassion training program as a preventive intervention program that may be of great benefit to
 308 informal caregivers, people with mental illness and the economic healthcare costs in Denmark.

309

310

311

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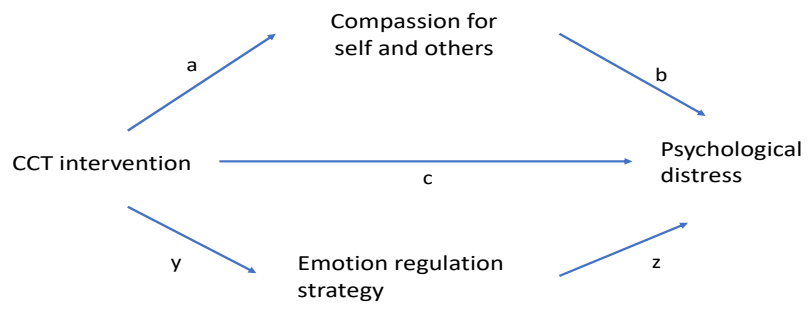
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1 **Statistical Analysis Plan: SAP_JAMA**

2

3 **Statistical Measures: 1)** We will compare the outcome variables (DASS, PSS, SCS-12, MCS,
4 ERQ, BRS, FFMQ-15, and WHO-5) correcting for multiple comparisons where appropriate using
5 the Student t or Wilcoxon tests. Analysis of covariance (ANCOVA) will be conducted to assess
6 whether CCT is related to changes between baseline and after 8 weeks of intervention in relation to
7 psychological distress. We will also use a random-effects repeated measures analysis to examine
8 the impact of the CCT intervention on psychological distress, adjusting for confounding variables
9 (age, gender, socio-economic status, and years as informal caretaker). The repeated measure
10 analysis approach accounts for the same individual's different outcome
11 measures across different points in time without assuming either linear or curvilinear
12 growth pattern. Cronbach alpha's will be computed to determine the internal consistency
13 of our outcome measures.

14 The four measurement points allow to test whether changes in the proposed mediators are
15 associated with changes in the proposed outcomes. This is a crucial condition in order to investigate
16 mediators and possible mechanisms (Kazdin A.E., 2007). We will use structural equation modelling
17 to examine the proposed mechanisms of CCT by testing the following action theories and
18 conceptual theories simultaneously (Chen, H-T., 1994; Goldsmith et al., 2018). The current project
19 assumes two conceptual theories, which will be tested: 1) changes in compassion for self and others
20 will affect psychological distress (DASS) and 2) changes in emotion regulation skills of reappraisal
21 and suppression (ERQ) will affect psychological distress (DASS). The action theories, that CCT
22 changes 1) compassion for self (SCS-12) and others (MCS) and 2) emotion regulation skills of
23 reappraisal and suppression (ERQ), will be tested. The indirect, direct and total effects will be
24 estimated with 95% CI inspired by a framework suggested by Goldsmith et al., (2018). The
25 statistical package M-Plus will be applied.



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