

Research Article

Developing Self-Compassion Online: Assessing the Efficacy and Feasibility of a Brief Online Intervention

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Abstract

The aim of the study was to assess the efficacy and feasibility of a newly designed online self-compassion training programme for the general public. Two hundred and forty-nine participants were randomly assigned to have either immediate or delayed access to a four-week online self-compassion training programme. This programme was based on Compassionate Mind Training and was made up of psychoeducational sessions and in-between session practices and readings. Out of the 179 participants who completed the pre-intervention measures, 81 participants completed the waiting list control design (45.25%; 52 participants from the waiting list group and 29 from the intervention group) and 50 participants went on to complete the intervention (27.9%; i.e., combining the 21 participants from the waiting list group that completed the intervention with the 29 from the intervention group). Compared to the control group, participants in the intervention group showed statistically significant increases in self-compassion and well-being and significant decreases in uncompassionate attitude towards self, shame, self-criticism, depression, anxiety, stress,



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levels of fear of compassion and attachment avoidance and anxiety. These effects remained at a one month follow up (based on data from 31 participants who completed these measures). The number of sessions completed was significantly predicted by baseline levels of well-being. This study provides promising results for the use of online self-compassion interventions to improve the mental wellbeing of the general public. However, further research is now needed to help understand the barriers to engagement and to help tailor its format to better suit participants who disengaged.

Keywords

Self-compassion; compassionate-mind training; online; self-compassion course; brief self-compassion training

1. Introduction

In the past two decades, there has been a rapid increase in compassion focused research. These studies have consistently found various benefits from the purposeful cultivation of compassion for others and ourselves [1-3]. Compassion training has been found to contribute to changes in the functioning of the autonomic nervous system, particularly the vagus nerve [4, 5]. Compassion trainings have also been found to lead to changes in neurophysiological responses in the brain [6], as well as psychological measures, including the reduction in distress and mental health symptoms, along with shame, self-criticism and anxious attachment (see [2] for a review, along with [7]).

Given some of these findings, there has been growing focus on the development of various evidence-based compassion programmes. These include Compassion Focused Therapy [8-10], Compassionate Mind Training (CMT; [7]), Mindful Self-Compassion [11], Compassion Cultivation Training [12], Cognitively-Based Compassion Training [13], and Cultivating Emotional Balance [14]. Whilst all of these approaches share many overlapping backgrounds (e.g. a shared backdrop in Buddhism and mindfulness), one of these approaches - Compassion Focused Therapy (CFT - and its associated format of Compassionate Mind Training) - has a different model underpinning it. CFT is grounded in evolutionary, attachment and social mentality theory [8, 15-17]. It was initially developed as a transdiagnostic approach for people high in shame and self-criticism who had often struggled with difficult and traumatic experiences in their lives [10, 14, 15]. Outcome studies have shown that CFT may be an effective psychological treatment for a variety of difficulties [2, 18, 19], including working with members of the general public [7].

An integral part of CFT is Compassion Mind Training (CMT). CMT involves psychoeducation on the definition of compassion, that there are three flows (i.e., other to self, self to other and self to self), but also common fears, blocks and resistances to compassion. The training explores how the evolved nature of mind and body have left us with 'tricky brains' which are 'not our fault', and that we have emotions which evolved to serve certain functions. These emotions cluster into three 'systems' - threat, drive and soothing. Psychological suffering is thought to occur when these systems become unbalanced [9, 16, 17]. CMT also involves a variety of physiological and psychological practices to help activate the soothing system, including attention training, mindfulness, soothing rhythm breathing and compassion-based imagery, and are outlined in various

resources [9, 20]. These practices have been found to activate the parasympathetic nervous system and lead to increases in heart-rate variability (HRV; [21]) along with increasing levels of self-compassion, self-reassurance and positive emotions and a reduction in self-criticism, shame and psychological distress [7, 22, 23].

A serious public health concern that we are currently facing is, of course, the impact of COVID-19 on global mental health. The pandemic has caused significant life changes for all of us, and this has impacted on mental well-being [24]. Encouraging compassion at the present time is therefore an important initiative. Mental health promotion initiatives should aim to be accessible, sustainable and adaptable [25, 26] and “light-touch” (i.e., non intensive) approaches, such as CMT, can provide a cost effective and time efficient means of engaging a broad range of people.

In recent years, with the advent of apps and mobile technology, various online interventions have been created with the intention of cultivating mindfulness and compassion. Systematic reviews and meta-analyses have suggested that these interventions may be helpful in increasing mindfulness and self-compassion, whilst also reducing psychological distress [27-29]. Due to the social distancing restrictions in place because of the coronavirus outbreak, developing online interventions seems more relevant than ever.

Although there have been several new studies assessing the effectiveness of online compassion interventions (e.g., [30, 31]) only one study that we know of has looked at the effectiveness of CMT within a general population sample. Halamová et al. [32] assessed the effectiveness of a 14-day CMT intervention on reducing self-criticism and increasing self-compassion. They found that the CMT intervention was effective at reducing self-criticism and self-uncompassionate responding but did not increase self-compassion or self-reassurance. It might be questioned whether the mixed results found for the CMT intervention were due to its design; a new exercise each day might not give participants enough time to reflect on the concepts and utilise them in their everyday lives. Furthermore, no information was gathered about the participants’ mental well-being or potential barriers i.e., levels of fear of compassion or attachment style.

Given these considerations, the current study sought to investigate the feasibility and efficacy of a brief, four-session online self-compassion course, based upon aspects of the CFT model. We hypothesised that in comparison to those on a waitlist to access the course, participants using the online course will have changes in psychological distress (depression, anxiety and stress), wellbeing, and secondary measures in self-compassion, fear of self-compassion, self-reassurance, self-criticism, shame and attachment insecurity.

2. Materials and Methods

2.1 Recruitment

The research study was advertised on various social media websites (Facebook, Instagram, Twitter and Reddit) with the aim of reaching a diverse population, i.e., through community groups rather than university groups. The advert asked whether the reader is someone who “struggles with being too hard on themselves” and whether they are “interested in learning how to be more self-compassionate”.

We based our power analysis (using G*Power3 [33]) on our main waitlist control analysis using a medium effect size of .25 (with alpha set at .05, beta at .8, number of groups= 2, number of

measures= 2, correlation among repeated measures = .5 and nonsphericity correction=1) producing a minimum total sample size of 34 (17 per group). An estimated medium effect size was based on previous online intervention studies showing increases in self-compassion [30]. Previous studies using a similar online design have found high attrition rates between 30-60% [30, 32] and so we aimed to err on the side of caution by recruiting at least 100 participants.

The advert was closed after six days as we had already recruited 249 participants and there was only one researcher to manage the sample. Participants were randomly allocated to either group 1 or 2 based on the order in which they signed up. All participants were over 18 years old, with the only exclusion criterion being an inability to understand spoken and written English.

2.2 Protocol

Before the first session, participants were asked to complete the package of pre-session outcomes measures. Following the completion of each session, participants were able to download follow-up guided audio exercises and written handouts covering ideas discussed in the session. One week after each session (before they accessed the next session) participants were asked to complete the Compassionate Mind Practice Recording Diary (taken from [23]) to assess how much they practiced the exercises during that week. One week after the last session of the programme, participants were sent a final link to Qualtrics to watch a brief closing session, complete the package of outcome measure and the final Compassionate Mind Practice Recording Diary.

Lastly, participants were sent a link to complete the outcome measures one month after completing the online programme. Only participants who completed this final stage of the study were asked if they would like to enter themselves into a prize draw for the chance to win an online shopping voucher or donation to charity (worth 10 British pounds) for having participated in the study. All of the participants who completed the intervention were invited to take part in a follow up interview. Please see Deacon et al., this edition, for further details on the findings from these interviews.

Please see Figure 1 for a diagram of the protocol. All of the sessions, questionnaires and follow-up materials were accessed through Qualtrics. Ethical approval was obtained from University of College London (UCL) Psychology Ethics Committee (ref: CEHP/2020/581) on 1/08/2020.

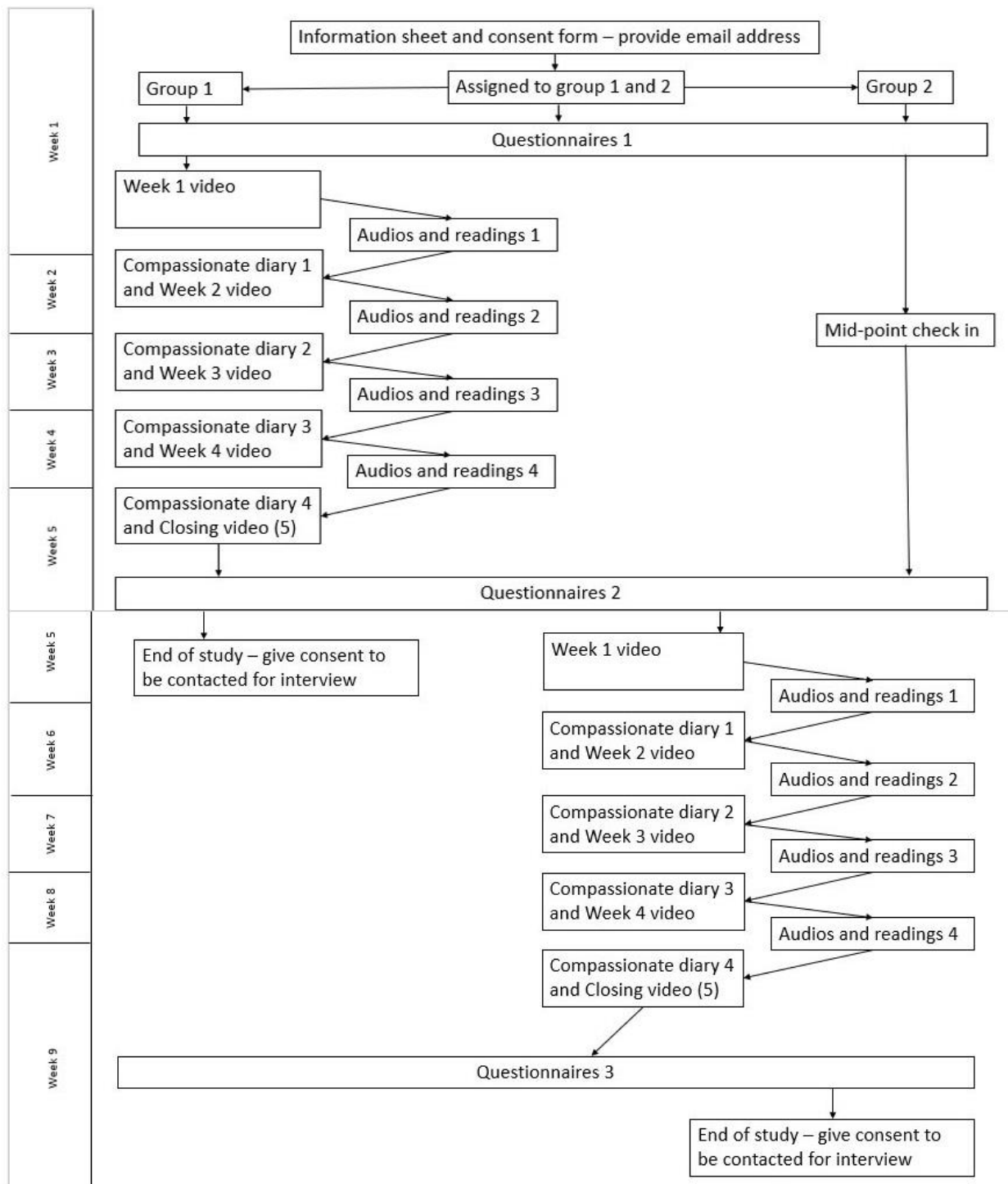


Figure 1 Diagram of protocol for groups 1 and 2.

2.3 Intervention Content

The content for the online training was developed by one of us (CI), drawing from CFT theory, practice, and outcome research (e.g., [9, 20, 23] with a particular focus on CMT exercises. Please see Table 1 for an outline of the content of each session.

Table 1 Training programme content.

Session	Contents
1	This session explored how to lay the foundations for self-compassion by understanding the affection regulation (i.e. “three-systems”) model in CFT [9]. Participants then engaged in an exercise called soothing rhythm breathing which is linked to accessing and developing the parasympathetic nervous system (which has been found, amongst other things, to be related to threat regulation and social connection - see [21]).
2	This session explored the concept of developing a compassionate self and helped participants to begin to direct a sense of compassion and good will to themselves. This practice has been found to be associated with reductions in shame and stress, and an increase in self-compassion (see [23] and [6]).
3	This session involved learning to switch from a “threat mind”, to a “compassion mind”, and further develop self-compassion through compassionate imagery (see [9, 20, 34]).
4	This session explored self-compassion principally through compassionate letter writing, which utilises adaptations to expressive writing to help participants develop a more compassionate relationship with themselves [15].
5	Closing session - this final session included a brief summary of the training programme.

2.4 Measures

2.4.1 Demographic Measures

The categories of personal data collected were gender, age, ethnicity, highest level of education, occupation, and previous experience of therapy. Please see “Additional materials” for a table detailing the demographic data of the sample.

2.4.2 Feasibility Measures

In order to assess feasibility, data was collected regarding drop-out rates across different time points and participants were asked to complete the Compassionate Mind Practice Recording Diary (taken from [23]) each week to assess how often they practiced the exercises.

2.4.3 Efficacy Measures

The Self-Compassion Scale - Short Form. (SCS-SF; [35]). Self-compassion was measured using the shorter version (12-item) of the original 26-item questionnaire [36]. It has been shown to have near perfect correlation with its total scores ($r \geq 0.97$) and has good internal reliability (Cronbach’s alpha ≥ 0.86 ; [35]). Participants are asked to indicate how often they behave in the stated manner (e.g.,

'When I fail at something important to me, I become consumed by feelings of inadequacy') using a 5-point Likert scale (1-Almost never to 5-Almost always).

Although the SCS is the most commonly used measure of self-compassion, its validity has recently come under scrutiny (please see [37] for a review). Due to the argument that the measure's two dimensions may differentially relate to external constructs (e.g. [38, 39]), we assessed compassionate and uncompassionate attitude towards self separately.

Forms of Self-Criticizing/Attacking & Self-Reassuring Scale. (FSCRS; [40]). We used this 22-item self-report questionnaire to measure trait self-criticism and self-reassurance. This measure comprises of three subscales: inadequate self; hated self; reassured self. Gilbert et al. [40] found good internal reliability with Cronbach's alpha of .90 for inadequate self and .86 for both hated and reassured self and the measure has been validated in both healthy and clinical populations [41]. The scale assesses participants' thoughts and feelings about themselves in reaction to a perceived failure or mistake using a 5-point Likert scale (0-not at all like me to 4-extremely like me).

Warwick-Edinburgh Mental Well-Being Scale. (WEMWBS; [42]). We used this 14-item self-report questionnaire to measure subjective well-being and psychological functioning. Participants were asked to rate their experience of various statements in regard to thoughts (e.g. "I've been thinking clearly") and feelings (e.g. "I've been feeling cheerful") over the past two weeks on a 5-point Likert scale (1 = None of the time, 5 = All of the time). The measure has shown good internal consistency, with a Cronbach's alpha score of 0.91 (population sample; [42]).

The Depression, Anxiety and Stress Scale - 21 Items. (DASS-21; [43]). We used this 21-item self-report instrument (a shortened version of the original DASS-42) comprising of three subscales, each with seven items, to measure symptoms of depression, anxiety and stress. The scale has good internal consistency, with Cronbach's alphas of .94 for depression, .87 for anxiety, and .91 for stress [44]. Participants were asked to rate how much each statement applied to them over the past week, on a 4-point Likert scale (0 = did not apply to me at all, 3 = applied to me very much, or most of the time).

External and Internal Shame Scale. (EISS; [45]). We used this 8-item measure to assess the experience of external and internal shame. Participants were asked to rate how much they felt each statement on a 5-point Likert scale (0 = Never, 4 = Always). Good internal consistency has been found for internal shame (Cronbach's alpha = .82), external shame (Cronbach's alpha = .80) and the global score (Cronbach's alpha = .89; [45]). We chose to analyse the dimensions separately (i.e. external and internal shame) because it is thought that the two forms of shame have different origins, are related to different self-constructs, and need different types of therapeutic management [46].

Fears of Compassion Scale. (FCS; [47]). We used the fear of compassion for *self*-subscale. This subscale is made up of 15 items. Participants were asked to score statements (e.g. "I feel that I don't deserve to be kind and forgiving to myself") on a 5-point Likert scale (0 = Don't agree at all, 4 = Completely agree). Internal consistency was found to be good in both a student sample (Cronbach's alpha = .92) and a therapist sample (Cronbach's alpha = .85; [47]).

Experience of Close Relationships - Short Form. (ECR-S; [48]). We used this 12 item self-report adult attachment style questionnaire to measure two key dimensions of attachment, the degree to which one feels anxious in attachment relationships (e.g., 'I need a lot of reassurance that I am loved by my partner'.), and the degree to which one feels avoidant (e.g., 'I try to avoid getting too close to my partner'.). Participants were asked to respond on a 7-point Likert scale (1=disagree strongly, 7=agree strongly) with a score of 4 as neutral. Internal consistency, as measured by Cronbach's alpha, was found to be good for both avoidance (.94) and anxiety (.91).

2.5 Participants

Although 249 participants initially signed our consent forms, 179 went on to complete the pre-intervention measures. From these, 50 participants completed the intervention. Please see figure 2 for the flow diagram of participant engagement across the study.

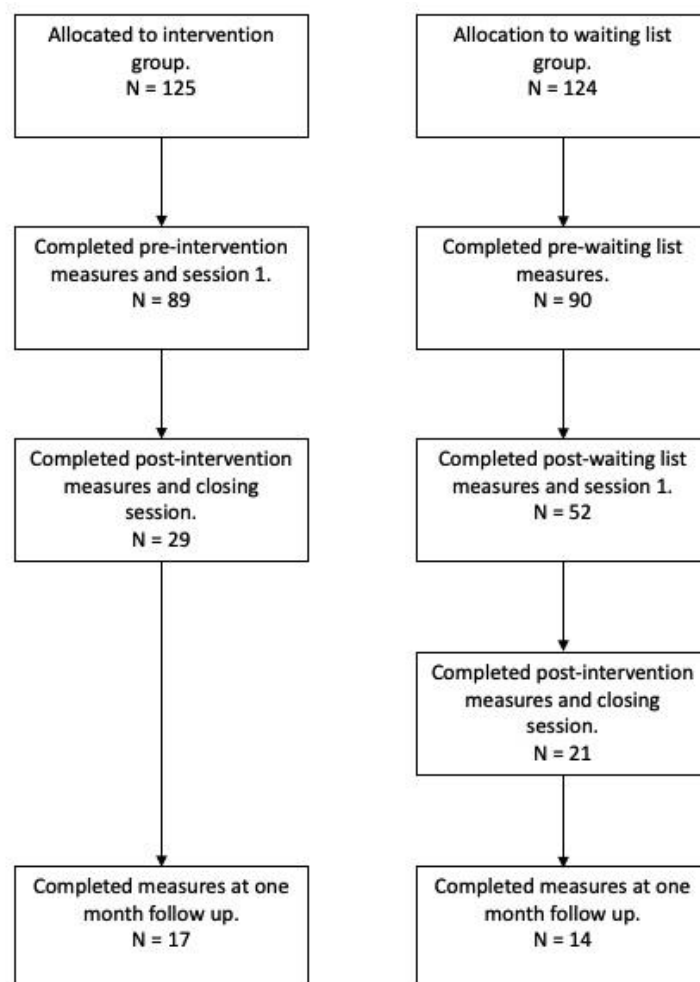


Figure 2 Flow diagram of participant completion rate.

2.6 Data Analysis

The analyses were all conducted using SPSS version 26. Participants with missing pre intervention/waiting list questionnaire data were not included in the analysis. Extreme outliers were identified using box plots and removed. Removing milder outliers did not create any difference in

the test results and so we chose to include them. We reviewed skewness and kurtosis on all measures (pre and post intervention) and found that 37.5% of the variables were significantly different from a normal distribution (using the Shapiro-Wilk test). We therefore decided to use the bootstrap sampling method (95% bias corrected and accelerated confidence intervals based on 1,000 samples) on all t-tests and correlations to overcome this [49]. For our repeated-measures analyses, where the assumption of sphericity was violated (tested using Mauchley’s test of sphericity), we corrected the degrees of freedom using the Greenhouse-Geisser procedure. For our between-subjects’ analyses, where the assumption of equal variance was violated (tested using the Levene’s test of equal variance), the degrees of freedom were also corrected. We chose to not adjust for multiple comparisons because, as the results were complementary towards the same hypothesis, there was reduced risk of false positives [50]. However, we have marked where the result would have remained significant after correcting for this for completeness. Effect sizes for the ANOVAs were calculated using partial eta squared (η^2p), with $\eta^2p = 0.01$ referring to a small effect size, 0.06 to a medium effect size and 0.14 to a large effect size [51]. The effect sizes for the t tests were calculated using Cohen d, with 0.2 indicating a small effect, 0.5 a medium effect and 0.8 a large effect [52].

3. Results

3.1 Assessment of Feasibility

We found that 27.93% of the original 179 participants who completed the pre-intervention measures went on to complete the intervention and post-intervention measures (29 from the intervention group and 21 from the waiting list group). Out of these 179 participants, 68 (38%) completed 1 session, 26 (14.5%) completed 2 sessions, 18 (10.1%) completed 3 sessions, 22 (12.3%) completed 4 sessions and 45 (25.1%) completed all 5. The number of sessions completed by the 179 participants, significantly correlated with baseline self-compassion, well-being, shame, inadequate, reassured, and hated self, depression, anxiety, and fear of compassion. Please see table 2 for a summary of the correlations.

Table 2 Pearson correlations between number of sessions completed and baseline measures.

	No. sessions	Std. Error	BCa 95% CIs
Compassionate attitude	0.15	0.08	[-0.00, 0.30]
Uncompassionate attitude	-0.20*	0.08	[-0.35, -0.06]
Well-being	0.23**	0.08	[0.05, 0.40]
External shame	-0.19*	0.08	[-0.33, -0.03]
Internal shame	-0.21**	0.07	[-0.35, -0.07]
Inadequate self	-0.18*	0.08	[-0.33, -0.03]
Reassured self	0.17*	0.08	[0.01, 0.31]
Hated self	-0.18*	0.08	[-0.33, -0.03]
Depression	-0.20*	0.07	[-0.33, -0.06]
Anxiety	-0.10	0.08	[-0.24, 0.05]
Stress	-0.06	0.08	[-0.20, 0.07]

Fear of compassion	-0.12	0.08	[-0.27, 0.04]
Avoidant attachment	0.01	0.07	[-0.13,0.15]
Anxious attachment	-0.08	0.07	[-0.22, 0.06]

Please note: Bootstrapping completed with 1,000 samples. *= $p < .05$, **= $p < .001$.

We used this information to create a hierarchal regression model (i.e., in order of correlation strength). At step one, we included well-being as a predictor variable and found that it significantly predicted 5% of the variance in sessions completed. In step 2 we added “internal shame”. However, it did not significantly add to the explanation of the variance. We therefore stopped entering predictor variables at this step. Please see table 3 for a summary for the regression statistics.

Table 3 Linear model of predictors of number of sessions completed.

	<i>b</i>	BCa 95% CI	<i>SE B</i>	β	<i>p</i>
Step 1					
Constant	0.92	[-0.51, 2.11]	0.68		0.18
Well-being	0.04	[0.01, 0.08]	0.02	.23	0.01
Step 2					
Constant	2.19	[0.23, 3.91]	0.95		0.02
Well-being	0.03	[0.01, 0.07]	0.02	.17	0.05
Internal shame	-0.07	[-0.14, 0.01]	0.04	-.14	0.72

Please note: $R^2 = .05$ for step 1; $\Delta R^2 = .02$ ($p = .08$); Confidence intervals and standard errors based on 1,000 samples.

Out of the 50 participants (29 from the intervention group and 21 from the waiting list group) who completed the pre intervention measures and the intervention and post intervention measures, 40 completed all 5 sessions (80%), 9 completed 4 sessions (18%) and 1 completed 3 sessions (2%). Descriptive data regarding practice frequency is presented in table 4 and showed that the majority of participants practiced the exercises between 1-4 times a week (similarly to previous studies, e.g., [23]). When asked about the helpfulness of the practices, the majority of participants (between 62-84% across the 4 weeks and increasing week by week) considered them as “quite helpful” or “very helpful”. As to whether they were able to act or feel as their compassionate self over the week, participants responded “yes” at a rate between 82-90% (depending on the week).

Table 4 Frequency of reported practice across the four weeks.

	Week 1		Week 2		Week 3		Week 4	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Never	1	2	5	10	2	4	5	10
1-2 times	9	18	13	26	19	38	20	40
3-4 times	21	42	18	36	17	34	14	28
5 or 6 times	10	20	10	20	7	14	7	14
7 or more times	5	10	2	4	3	6	2	4
Missing	4	8	2	4	2	4	2	4

3.2 Waitlist-Control Analysis

Out of the 179 participants who completed the pre-intervention questionnaires, 81 participants went on to complete the post-intervention / post-waiting list questionnaires (45.25%). Independent samples t-tests showed that completers scored significantly higher on baseline measures of self-reported “well-being” (WEMWBS) and “reassured self” (FSCRS) but lower on scores of self-reported “depression” (DASS) and “internal and external shame” (EISS), compared to non-completers. We found no significant differences between groups on demographic characteristics using chi squared. Please see table 5 for the details of the significant test results.

Table 5 Statistically significant t-tests between the “completers” and “non-completers” of the waitlist-control design.

Measure	Completers	Non-completers	Difference	BCa 95% CI	t-test	<i>d</i>
	(n=81)	(n=98)				
Well-being	43.01 (8.44)	39.66 (8.64)	-3.35	-5.94, -.83	$t(177) = -2.61, p = .01$	-0.39
Reassured self	16.49 (6.27)	14.27 (6.14)	-2.23	-3.91, -.57	$t(177) = -2.39, p = .02$	-0.36
Depression	13.11 (9.97)	17.10 (10.81)	3.99	.90, 7.08	$t(177) = 2.55, p = .01$	0.38
Internal shame	7.63 (3.45)	9.09 (3.54)	1.46	.48, 2.48	$t(177) = 2.78, p = .01$	0.42
External shame	7.37 (3.60)	8.47 (3.35)	1.1	.09, 2.18	$t(177) = 2.11, p = .04$	0.32

Please note: Bootstrapping method based on 1,000 samples.

Out of the 81 participants who completed the pre and post measures, 29 participants were from the intervention group and 52 were from the waitlist control group. Chi squared analyses showed that there were no significant differences in demographic characteristics between the groups apart from “current work status” and “previous therapeutic experience”. These are detailed in Additional materials.

Independent samples t-tests of the baseline outcome measures (i.e. pre-intervention) showed no significant differences apart from self-reported “anxiety” (DASS) which was higher (mean difference = 4.57, BCa 95% CI = .87, 8.14) in the intervention group [$t(79) = 2.50, p = .03, d=0.6$]. However, we did not feel there was a strong enough theoretical basis to include this as a confounder in subsequent analysis.

We employed a 2 × 2 mixed ANOVA design with the two conditions (intervention vs. waitlist control) as the between-group factor and time (pre and post intervention) as the within-group factor investigating different effects between conditions. Please see figure 3 for the results of the mixed model ANOVAs. The tests showed that for every outcome variable there was a significant effect of time and a significant time x group interaction. There was no significant effect of group for any of the analyses apart from for compassionate and uncompassionate attitude towards self. Paired samples t tests (using the bootstrapping method) were used with each group to assess effect of time within each group. There was a significant difference between time points for all the measures used for the intervention group (with the majority of effect sizes ranging between medium and large. Please see table 6 for details) but there were no significant differences between

time points for the waitlist-control group, apart from for fear of self-compassion which showed a significant increase.

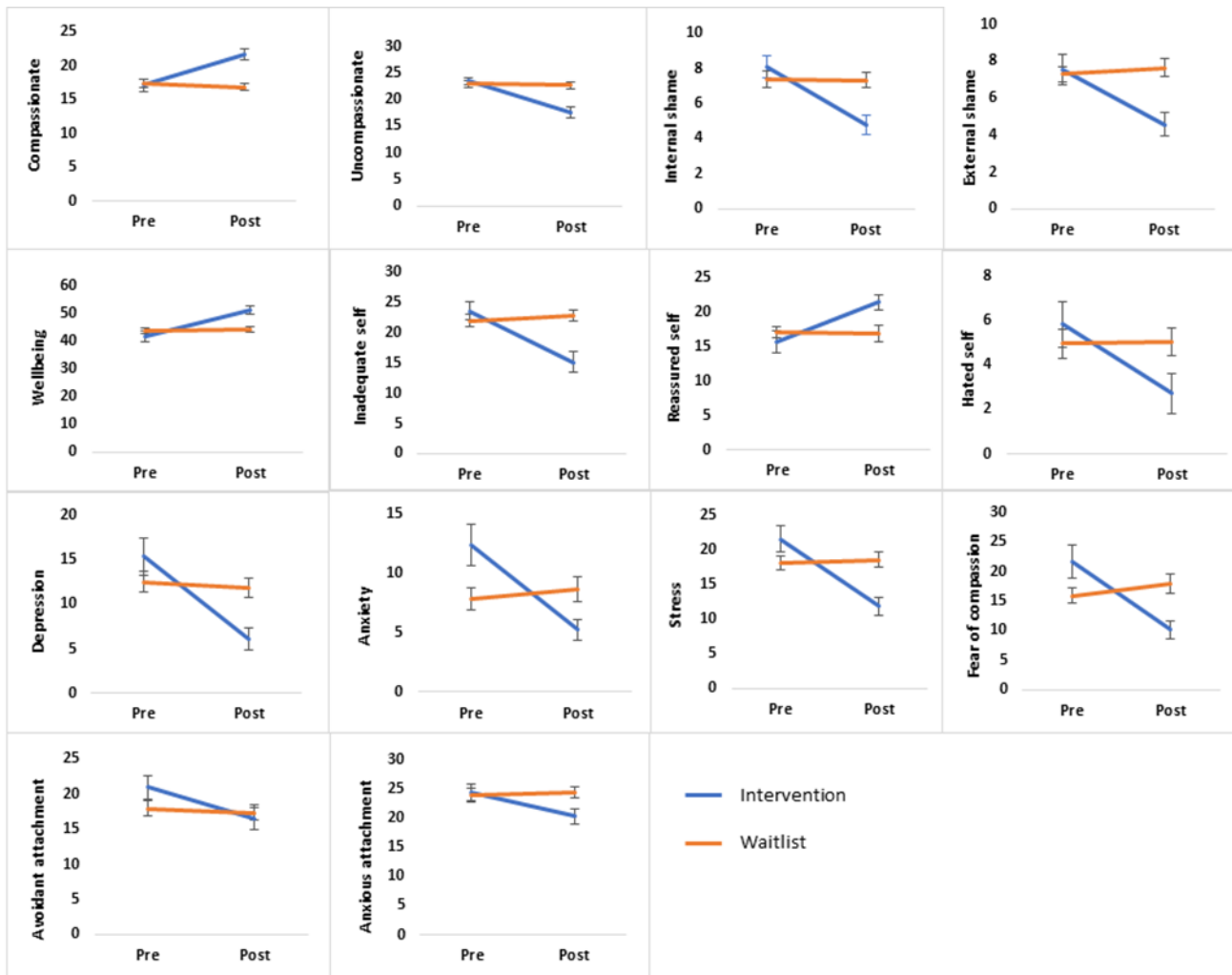


Figure 3 Pre- and post-intervention / waitlist (bootstrapped) means for all the outcome measures. Error bars = +/- 1 standard error.

Table 6 Mean scores, standard deviations, and statistics for both groups at pre- and post-intervention.

Measure	Time	Intervention (n=29) Mean (SD)	Waitlist (n=52) Mean (SD)	Time	Group	Time x Group	Significant post-hoc paired t-test	BCa 95% CI																																							
Compassionate attitude	T1	17.10 (5.02)	17.35 (4.12)	$F(1, 79) = 18.49, p < .000, \eta^2 p = .19$	$F(1, 79) = 6.73, p = 0.01, \eta^2 p = .08$	$F(1, 79) = 289.13, p < .000, \eta^2 p = .27$	Intervention group T1 < T2 $t(28) = -4.12, p = .01, d = 0.79$	[-7.00, -2.48]																																							
	T2	21.69 (4.29)	16.83 (4.21)						Uncompassionate attitude	T1	23.41 (4.21)	22.94 (4.31)	$F(1, 79) = 41.71, p < .000, \eta^2 p = .35$	$F(1, 79) = 6.35, p = .01, \eta^2 p = .07$	$F(1, 79) = 34.70, p < .000, \eta^2 p = .31$	Intervention group T1 > T2 $t(28) = 5.27, p = .002, d = 1.00$	[3.80, 8.10]	T2	17.55 (5.19)	22.67 (4.36)	Internal Shame	T1	8.10 (3.62)	7.37 (3.37)	$F(1, 79) = 17.94, p < .000, \eta^2 p = .19$	ns	$F(1, 79) = 17.13, p < .000, \eta^2 p = .18$	Intervention group T1 > T2 $t(28) = 3.94, p = .005, d = 0.66$	[1.72, 5.00]	T2	4.76 (3.08)	7.33 (3.36)	External shame	T1	7.52 (4.44)	7.29 (3.08)	$F(1, 79) = 9.60, p = .003, \eta^2 p = .11$	ns	$F(1, 79) = 15.43, p < .000, \eta^2 p = .16$	Intervention group T1 > T2 $t(28) = 3.27, p = .02, d = 0.62$	[1.30, 4.62]	T2	4.59 (3.51)	7.63 (3.53)	Well-being	T1	43.89* (7.03)
Uncompassionate attitude	T1	23.41 (4.21)	22.94 (4.31)	$F(1, 79) = 41.71, p < .000, \eta^2 p = .35$	$F(1, 79) = 6.35, p = .01, \eta^2 p = .07$	$F(1, 79) = 34.70, p < .000, \eta^2 p = .31$	Intervention group T1 > T2 $t(28) = 5.27, p = .002, d = 1.00$	[3.80, 8.10]																																							
	T2	17.55 (5.19)	22.67 (4.36)						Internal Shame	T1	8.10 (3.62)	7.37 (3.37)	$F(1, 79) = 17.94, p < .000, \eta^2 p = .19$	ns	$F(1, 79) = 17.13, p < .000, \eta^2 p = .18$	Intervention group T1 > T2 $t(28) = 3.94, p = .005, d = 0.66$	[1.72, 5.00]	T2	4.76 (3.08)	7.33 (3.36)	External shame	T1	7.52 (4.44)	7.29 (3.08)	$F(1, 79) = 9.60, p = .003, \eta^2 p = .11$	ns	$F(1, 79) = 15.43, p < .000, \eta^2 p = .16$	Intervention group T1 > T2 $t(28) = 3.27, p = .02, d = 0.62$	[1.30, 4.62]	T2	4.59 (3.51)	7.63 (3.53)	Well-being	T1	43.89* (7.03)	44.11* (7.01)		ns	$F(1, 79) = 12.34, p < .000, \eta^2 p = .14$	Intervention group T1 < T2	[-9.16, -3.41]						
Internal Shame	T1	8.10 (3.62)	7.37 (3.37)	$F(1, 79) = 17.94, p < .000, \eta^2 p = .19$	ns	$F(1, 79) = 17.13, p < .000, \eta^2 p = .18$	Intervention group T1 > T2 $t(28) = 3.94, p = .005, d = 0.66$	[1.72, 5.00]																																							
	T2	4.76 (3.08)	7.33 (3.36)						External shame	T1	7.52 (4.44)	7.29 (3.08)	$F(1, 79) = 9.60, p = .003, \eta^2 p = .11$	ns	$F(1, 79) = 15.43, p < .000, \eta^2 p = .16$	Intervention group T1 > T2 $t(28) = 3.27, p = .02, d = 0.62$	[1.30, 4.62]	T2	4.59 (3.51)	7.63 (3.53)	Well-being	T1	43.89* (7.03)	44.11* (7.01)		ns	$F(1, 79) = 12.34, p < .000, \eta^2 p = .14$	Intervention group T1 < T2	[-9.16, -3.41]																		
External shame	T1	7.52 (4.44)	7.29 (3.08)	$F(1, 79) = 9.60, p = .003, \eta^2 p = .11$	ns	$F(1, 79) = 15.43, p < .000, \eta^2 p = .16$	Intervention group T1 > T2 $t(28) = 3.27, p = .02, d = 0.62$	[1.30, 4.62]																																							
	T2	4.59 (3.51)	7.63 (3.53)						Well-being	T1	43.89* (7.03)	44.11* (7.01)		ns	$F(1, 79) = 12.34, p < .000, \eta^2 p = .14$	Intervention group T1 < T2	[-9.16, -3.41]																														
Well-being	T1	43.89* (7.03)	44.11* (7.01)		ns	$F(1, 79) = 12.34, p < .000, \eta^2 p = .14$	Intervention group T1 < T2	[-9.16, -3.41]																																							

	T2	50.11 (7.82)	44.61 (7.01)	$F(1, 76) = 16.93, p < .000, \eta^2 p = .18$	$t(26) = -4.29, p = .001, d = 0.60$	
Inadequate self	T1	23.52 (7.97)	21.94 (7.17)	$F(1, 79) = 22.13, p < .000, \eta^2 p = .22$	$F(1, 79) = 32.48, p < .000, \eta^2 p = .29$	Intervention group T1>T2 [4.73, 12.14]
	T2	15.07 (9.12)	22.75 (7.71)			$t(28) = 4.33, p < .001, d = 0.84$
Reassured self	T1	15.62 (7.07)	16.98 (5.79)	$F(1, 79) = 21.39, p < .000, \eta^2 p = .21$	$F(1, 79) = 22.87, p < .000, \eta^2 p = .23$	Intervention group T1<T2 [-8.50, -3.26]
	T2	21.34 (6.53)	16.89 (5.70)			$t(28) = -4.06, p < .001, d = -0.76$
Hated self	T1	5.82* (4.97)	4.96 (4.65)	$F(1, 78) = 11.63, p = .001, \eta^2 p = .13$	$F(1, 79) = 12.52, p = .001, \eta^2 p = .14$	Intervention group T1>T2 [1.08, 5.36]
	T2	2.71* (3.39)	5.02 (4.75)			$t(28) = 2.86, p = .008, d = 0.68$
Depression	T1	14.55 (11.32)	12.50 (8.49)	$F(1, 79) = 22.15, p < .001, \eta^2 p = .22$	$F(1, 79) = 16.13, p < .000, \eta^2 p = .17$	Intervention group T1>T2 [4.34, 13.47]
	T2	5.93 (6.53)	11.77 (7.97)			$t(28) = 3.80, p = .002, d = 0.67$
Anxiety	T1	12.21* (6.53)	7.85 (6.82)	$F(1, 78) = 16.64, p < .001, \eta^2 p = .18$	$F(1, 78) = 25.05, p < .001, \eta^2 p = .24$	Intervention group T1>T2 [4.52, 11.66]
	T2	5.36* (5.17)	8.65 (7.28)			$t(27) = 4.20, p = .001, d = 0.64$
Stress	T1	21.66 (10.42)	18.18 (7.31)	ns	$F(1, 79) = 22.15, p < .000, \eta^2 p = .22$	Intervention group T1>T2 [5.34, 14.66]

Fear of compassion	T2	11.86 (7.48)	18.65 (8.23)	$F(1, 79) = 18.34, p < .000, \eta^2 p = .19$	$F(1, 79) = 27.70, p < .000, \eta^2 p = .26$	$t(28) = 4.23, p = .004, d = 0.75$	[6.61, 16.96]
	T1	21.69 (15.13)	15.85 (9.48)			Intervention group T1>T2 $t(28) = 3.87, p = .01, d = 0.72$	
Avoidant attachment	T2	10.10 (9.30)	17.92 (11.63)	$F(1, 79) = 13.42, p < .000, \eta^2 p = .15$ ns	$F(1, 79) = 9.40, p = .003, \eta^2 p = .11$	Waiting list group T1<T2 $t(51) = -2.09, p = \mathbf{0.04}, d = 0.28$	[1.89, 7.56]
	T1	21.00 (9.51)	17.94 (7.97)	$F(1, 79) = 15.77, p < .000, \eta^2 p = .17$ ns		Intervention group T1>T2 $t(28) = 3.04, p = \mathbf{0.026}, d = 0.62$	
Anxious attachment	T1	24.31 (7.75)	23.87 (7.81)	$F(1, 79) = 5.12, p = .03, \eta^2 p = .06$ ns	$F(1, 79) = 8.80, p = .004, \eta^2 p = .10$	Intervention group T1>T2 $t(28) = 2.41, p = \mathbf{0.04}, d = 0.46$	[1.10, 7.64]
	T2	20.31 (7.36)	24.40 (7.08)				

Please note: All means, standard deviations, t-tests and confidence intervals are bootstrapped (1,000 samples); *=extreme outliers removed before the mean was calculated so N is smaller (indicated in the degree of freedom); p values in bold =did not remain significant after controlling for multiple comparisons using the Bonferroni method.

3.3 Assessing Temporal Change

We then combined the completers from the intervention group (n=29) to the participants from the waitlist control group that went on to complete the full intervention (n=21) in order to increase power (27.9% of the original 179 that completed the pre-measures). We found no significant difference in baseline outcome measures or demographic characteristics between the intervention completers (n=50) and non-completers (n=129). Out of the 50 participants who completed the intervention, 31 completed the one month follow up questionnaires (17.3% of the original 179).

We employed a repeated measures one-way ANOVA with “time” being the independent variable (pre, post and 1 month follow up). Please see table 7 for the results of the repeated measures ANOVAs which compared the outcome measures over the three time points. The tests showed significant results for all the outcome measures (with large effect sizes for all. Please see table 7 for details). Subsequent paired samples t-tests (with bootstrapping) showed that there were significant differences on all measures between pre and post and pre and follow-up questionnaires (with medium to large effect sizes for all tests). There were no significant differences between post and follow-up questionnaires for any of the measures apart from “fear of compassion” (FCS) which showed further reductions in scores at the one month follow up.

Table 7 Mean scores, standard deviations, and statistics for “completers” at pre-, post-intervention and one month follow up.

Measure	Time	N	Mean (SD)	Time	Significant post-hoc paired t-test	BCa 95% CI
Compassionate	T1	50	17.24 (4.41)	$F(1.56, 46.73) = 28.03, p < .001, \eta^2 p = .48$	T1<T2: $t(49) = -6.29, p = .001, d = 0.89$	[-6.02, -3.28]
	T2	50	22.42 (3.54)		T1<T3: $t(30) = -6.07, p = .001, d = 1.09$	[-8.00, -4.14]
	T3	31	22.23 (3.65)		T2<T3: ns	ns
Uncompassionate	T1	50	22.80 (4.19)	$F(1.56, 46.78) = 32.93, p < .001, \eta^2 p = .52$	T1>T2: $t(49) = 7.11, p = .001, d = 1.01$	[4.16, 7.16]
	T2	50	17.24 (4.62)		T1>T3: $t(30) = 6.39, p = .001, d = 1.15$	[4.92, 9.07]
	T3	31	15.83 (4.07)		T2>T3: ns	ns
Internal Shame	T1	50	7.82 (3.39)	$F(2, 60) = 27.00, p < .001, \eta^2 p = .47$	T1>T2: $t(49) = 4.27, p = .001, d = 0.77$	[1.46, 3.66]
	T2	50	4.76 (3.11)		T1>T3: $t(30) = 6.88, p = .001, d = 1.24$	[3.11, 5.55]
	T3	31	4.39 (2.55)		T2>T3: ns	ns
External shame	T1	50	7.42 (3.83)	$F(1.59, 47.60) = 15.39, p < .001, \eta^2 p = .34$	T1>T2: $t(49) = 4.27, p = .001, d = 0.60$	[1.46, 3.66]
	T2	50	4.90 (3.44)		T1>T3: $t(30) = 4.06, p = .002, d = 0.73$	[1.90, 4.77]
	T3	31	4.90 (2.55)		T2>T3: ns	ns

Well-being	T1	49	43.53 (7.75)*	$F(1.39, 40.22) = 15.70, p < .001, \eta^2 p = .35$	T1<T2: $t(48) = -5.56, p = .001, d = 0.79$	[-10.60, -4.78]
	T2	49	50.98 (6.95)*		T1<T3: $t(29) = -4.34, p < .001, d = 0.79$	[-12.48, -4.50]
	T3	31	51.19 (6.66)		T2<T3: ns	ns
Inadequate self	T1	50	22.86 (7.47)	$F(1.52, 45.55) = 35.14, p < .001, \eta^2 p = .54$	T1>T2: $t(49) = 6.49, p = .001, d = 0.92$	[5.90, 10.91]
	T2	50	14.56 (8.16)		T1>T3: $t(30) = 7.20, p = .001, d = 1.29$	[8.47, 14.82]
	T3	31	12.58 (5.95)		T2>T3: ns	ns
Reassured self	T1	50	16.30 (6.04)	$F(1.48, 44.26) = 20.71, p < .001, \eta^2 p = .41$	T1<T2: $t(49) = -5.35, p = .001, d = 0.76$	[-6.80, -3.36]
	T2	50	21.30 (5.78)		T1<T3: $t(30) = -5.13, p = .002, d = 0.92$	[-9.54, -4.51]
	T3	31	22.32 (4.78)		T2<T3: ns	ns
Hated self	T1	50	5.34 (4.85)	$F(1.23, 35.57) = 13.82, p < .001, \eta^2 p = .32$	T1>T2: $t(48) = 3.71, p = .001, d = 0.53$	[1.43, 3.71]
	T2	49	2.57 (3.10)*		T1>T3: $t(30) = 4.63, p < .001, d = 0.83$	[2.48, 6.07]
	T3	31	2.16 (2.67)		ns	[0.39, 1.94]
Depression	T1	50	13.88 (10.13)	$F(1.40, 42.10) = 13.25, p < .001, \eta^2 p = .31$	T1>T2: $t(49) = 4.28, p = .001, d = 0.61$	[4.32, 10.17]
	T2	50	6.60 (6.72)		T1>T3: $t(30) = 4.10, p = .002, d = 0.74$	[5.11, 13.81]

	T3	31	6.32 (4.82)			T2>T3: ns	ns
Anxiety	T1	48	10.45 (8.93)*			T1>T2: $t(47) = 5.07, p < .001, d = 0.73$	[4.04, 9.11]
	T2	48	4.00 (3.67)*	$F(1.21, 33.75) = 18.10,$ $p < .001, \eta^2 p = .39$		T1>T3: $t(30) = 4.11, p < .001, d = 0.74$	[4.11, 11.857]
	T3	31	4.58 (5.27)			T2>T3: ns	ns
Stress	T1	50	20.12 (9.77)			T1>T2: $t(49) = 5.93, p = .001, d = 0.84$	[6.09, 11.71]
	T2	50	11.28 (6.50)	$F(1.62, 48.54) = 22.87,$ $p < .001, \eta^2 p = .43$		T1<T3: $t(30) = 5.38, p = .001, d = 0.97$	[7.00, 14.27]
	T3	31	11.23 (6.60)			T2>T3: ns	ns
Fear of self-compassion	T1	50	20.64 (14.42)			T1>T2: $t(49) = 5.45, p = .001, d = 0.77$	[7.34, 15.32]
	T2	50	9.66 (8.29)	$F(1.33, 38.59) = 22.66,$ $p < .001, \eta^2 p = .44$		T1<T3: $t(29) = 5.85, p < .001, d = 0.99$	[10.82, 21.18]
	T3	29	6.41 (5.16)*			T2<T3: $t(29) = 3.04, p = .01, d = 0.44$	[1.19, 6.25]
Avoidant attachment	T1	50	20.08 (8.24)			T1>T2: $t(49) = 4.27, p = .002, d = 0.60$	[2.14, 5.90]
	T2	50	16.12 (6.81)	$F(1.23, 36.94) = 11.55,$ $p = .001, \eta^2 p = .28$		T1<T3: $t(30) = 3.66, p = .02, d = 0.66$	[2.62, 7.65]
	T3	31	16.48 (6.96)			T2<T3: ns	ns
Anxious attachment	T1	50	24.33 (7.77)	$F(1.48, 44.40) = 10.37,$ $p = .001, \eta^2 p = .26$		T1>T2: $t(49) = 3.90, p = .003, d = 0.55$	[2.19, 6.58]

T2	50	19.64 (6.88)	T1<T3: $t(30) = 3.67, p=.005, d = 0.66$	[2.81, 8.93]
T3	31	18.61 (7.54)	T2>T3: ns	ns

Please note: All means, standard deviations, t-tests and confidence intervals are bootstrapped (1,000 samples); *=extreme outlier(s) removed before the mean was calculated so N is smaller (indicated in the degrees of freedom); p values in bold =did not remain significant after controlling for multiple comparisons using the Bonferroni method.

4. Discussion

To our knowledge, this is the most thorough assessment to date of an online self-compassion training programme (CMT) aimed at the general population. We found that 81 of the 179 participants that completed the pre-measures went on to complete the post-measures (52 from the waiting list group and 29 from the intervention group). The results indicated that, compared to the waiting-list control group, the online programme was effective at increasing levels of self-reported self-compassion, well-being and self-reassurance and decreasing levels of uncompassionate feeling towards self, self-criticism (i.e., “hated” and “inadequate” sense of self) internal and external shame, depression, anxiety and stress, levels of fear of compassion, and attachment avoidance and anxiety (all with a medium to large effect size). Furthermore, in those that completed the follow up measures (31 participants), the positive effects were still prevalent one month later and levels of fear of self-compassion showed even further reductions.

These results extend the preliminary results of other studies of brief online CMT interventions for the general population (e.g. [32]) by looking at a more extensive range of outcome measures. We found that participants who completed the intervention showed improvements in both the positive and negative items of the self-compassion scale, whereas Halamová et al. [32] only found decreases in negative self-relating. We found similar results to those found in more intensive interventions, such as an 8-week CMT group for the general population [7], which also found medium to large effect sizes. It is encouraging to find such promising results using a low-cost, online format as it will enable widened access to compassion focused interventions for the general population.

CFT was initially developed for people high in shame and self-criticism, and in support of this we found decreases in both internal and external shame, as well as reductions in both types of self-criticism measures; “inadequate self” and “hated self”. Research suggests that self-compassion may moderate the link between shame and psychological distress [53], and our findings support the theory that increasing self-compassion helps enable a positive self-view even when an individual has failed to live up to their own expectations, or feels judged or devalued by others [9, 54].

Comparatively, we found higher rates of anxiety, depression, and stress than in other general population studies (e.g. [7, 23]). It is likely that this is due to the study having been conducted within the context of a pandemic, as there is recent research demonstrating significant increases in the reported mental health symptoms of the general public [55]. It may be that the intervention was particularly effective because it was a well-timed intervention for a non-clinical sample going through a transient and difficult time. Previous studies looking at non-clinical samples have found varied effectiveness in reducing symptoms of psychological distress (e.g. [7, 23]), which they suggested may have been due to a floor effect. It may be the case, therefore, that we would not find the same pattern if we were to repeat the study after lockdown restrictions have eased.

Despite concerns that fear of self-compassion might be a barrier to engagement, we found that fear of self-compassion was not related to the number of sessions completed. In fact, we found that the intervention resulted in significant reductions in this trait, with medium to large effect sizes, and that there continued to be reductions one month later. As suggested by Matos, Duarte, Duarte, Pinto-Gouveia et al. [23], it appears that although individuals high in fear of compassion might at first respond to compassion with a threat response [56], as they learn more about the evolution of the human mind and about compassion ideas and practice, their fears and resistances may settle.

This is in line with other CMT interventions that also found a reduction in fear of compassion (e.g. [23]). Surprisingly, the control group reported a significant increase in their fear of compassion score following their four week wait. It may be that completing these measures twice resulted in participants feeling more attuned to their concerns and fears whilst anticipating the start of the intervention.

We also found reductions in anxiety and avoidant attachment traits in participants who completed the intervention. It is thought that CMT may be at least partly effective through stimulating the attachment system [57] and our results support this by showing that participants were led towards greater attachment security. There is a growing evidence base which suggests that self-compassion may mediate the relationship between attachment and psychological health (e.g. [58]) and, in response to this, there has been an increased interest in developing compassion-focused interventions for new mothers [59-62].

Finally, in line with other studies on CFT/CMT (e.g. [63]) we found that the intervention led to increases in self-reported well-being. However, we also found that baseline well-being levels significantly predicted the number of sessions completed. In a recent study on physical activity levels during the pandemic, Marashi et al. [64] found a “mental health paradox” whereby mental health was both a motivator and a barrier to physical activity. Due to this, it is clear that a variety of interventions are needed to serve a diversity of individuals. It appears that the course was effective for those who completed it, but shorter courses or courses that include some contact with a professional online may be better suited to the participants who dropped out. Further research is now needed to help determine this.

4.1 Limitations and Future Research

We did not ask participants to disclose mental health diagnoses and we had no exclusion criteria based on this. The mean scores for self-reported anxiety, depression and stress fell within the “mild-moderate” ranges before the intervention and “mild-normal” ranges after the intervention (ranges according to [43]). The DASS-21 has no direct implications for the allocation of participants into diagnostic categories. However, due to the range of scores found in this study (“normal to “extremely severe”), it is likely that the sample included participants who would reach criteria for a diagnosable mental health condition. Further investigation into the usefulness of this intervention should more thoroughly analyse participants’ mental health history.

The study used self-reported measures to assess effectiveness, but we did not use attention checks. We cannot guarantee, therefore, that participants did not rush through the measures without paying attention to their answers. Only two participants clearly answered without paying attention (i.e., answering the same answer to everything). These two participants, however, only completed the pre-intervention measures and then dropped out so were not included in the data analyses.

It is difficult to determine whether the high attrition rates were due to the nature of the intervention itself, the research design or the pandemic. The pandemic caused a lot of instability, with many losing their usual routine or facing new time pressures and having to juggle additional responsibilities (e.g. working from home and covering child care). Halamová et al.’s [32] randomised control trial of an online CMT intervention for the general population started with 144 participants (who completed the pre-measures) but only 46 participants completed the post-measures (32%,

compared to 45% in the current study). Furthermore, their intervention was only two weeks long, participants were sent an email every day, and they had a larger incentive to complete the programme (the chance to win a tablet). Their study was also conducted before the pandemic. We found that baseline well-being scores significantly predicted the number of sessions completed, but the model only explained 5% of the variance. We hypothesise that this percentage might have been higher if we had used a measure of well-being at the point of drop out, rather than at baseline. Following further research to explore this, we feel that there would be a great opportunity to improve this training programme by developing it to increase motivation and engagement levels. We found that 27.9% of participants completed the intervention. It will be interesting to determine engagement levels when individuals are not subjected to the requirements of the research study (i.e., accessing the materials through Qualtrics and completing the questionnaires and practice diaries).

As this was the first study of this newly developed training programme, we used a waiting list group as our control in order to measure feasibility and acceptability. Further research is now needed using a treatment control group to refine and improve the programme's content and format. Further research is also needed to assess sustainability. We found improvements remained for the four weeks after the end point, but a longitudinal design could help identify whether the effects remain after a longer time period and help determine whether participants could benefit from repeating the programme at a later date or from having a "refresh" session.

5. Conclusions

This study found promising results for the effectiveness of this new online training programme in cultivating self-compassion and improving the mental health of the general population. Many people in need of mental health services do not receive treatment [65] and it is expected that many more people will need access to support moving forward due to the continuing effects of the pandemic. We found that 27.9% of participants completed the intervention and so further research is now needed to tailor the intervention's delivery to increase engagement.

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Additional Materials

The following additional materials are uploaded at the page of this paper.

1. Table S1: Demographic details of sample.
2. Detail on demographic differences between the intervention and wait list control groups.

Author Contributions

Conceived and designed the experiment: CN, JD, JK, CI; acquired and analysed the data: CN; drafted the manuscript: CN and CI; revised the manuscript: CN, JD, JK and CI.

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Competing Interests

The intervention outlined in this paper has been developed to be accessible to the general public via Balanced Minds. Due to this, CI was not involved in the collection or analysis of the data.

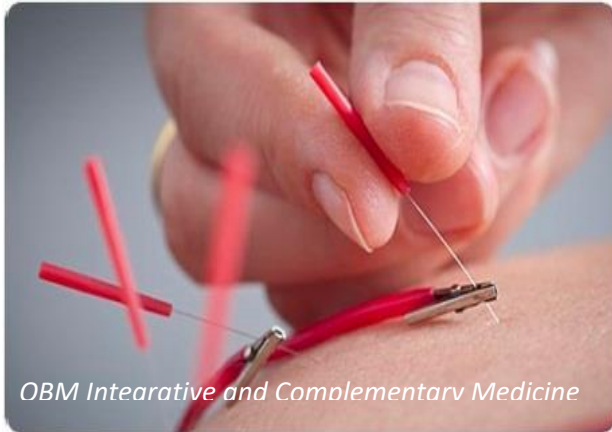
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