HETASHI BAWA BSc Hons MSc

AN INITIAL EVALUATION OF AN ONLINE, COMPASSIONATE INTERVENTION FOR ADULTS WITH TYPE 1 AND TYPE 2 DIABETES MELLITUS.

Section A: A systematic review exploring the effectiveness and acceptability of digital, self-compassion interventions for adults with chronic physical health conditions.
Word Count: 7896 (157)

Section B: An initial evaluation of an online, compassionate intervention for adults with Type 1 and Type 2 Diabetes Mellitus.
Word Count: 7949 (304)

Overall Word Count: 15,845 (461)

A thesis submitted in partial fulfilment of the requirements of
Canterbury Christ Church University for the degree of
Doctor of Clinical Psychology

APRIL 2024

SALOMONS INSTITUTE
CANTERBURY CHRIST CHURCH UNIVERSITY

Acknowledgements

With God's blessing, achieving each and every milestone on the doctorate has been possible. I would like to thank my amazing family and friends for their patience, endless nurturing, and unwavering support throughout my journey.

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This project was made possible by participants who had faith in the research and dedicated time to try a new intervention. Thank you to everyone who participated and shared my project.

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Finally, I would like to thank my research supervisor, Dr Alan Hebben-Wadey, and two Consultants, Dr Chris Irons and Dr Fergal Jones, for providing supervision with encouragement and support for my research project.

Summary of MRP

Section A

A systematic review of digital self-compassion interventions for adults with Chronic Physical Health Conditions was conducted to quantitatively assess effectiveness and acceptability. A narrative review of 12 papers underwent quality appraisal using the Effective Public Health Practice Project Tool. All studies demonstrated the effectiveness of digital, self-compassion interventions based on changes in self-compassion, psychological or condition-specific measures, however acceptability varied. Promising initial outcomes were established for breast cancer and chronic pain populations in particular. Proposals for further research were based upon most studies achieving poor quality ratings and the limited digital, self-compassion literature for the CPHC population.

Section B

A randomised controlled trial was conducted using a brief, online, self-help, Compassionate Mind Training intervention for adults with Type 1 and Type 2 Diabetes Mellitus. At baseline, 157 participants were randomised to the intervention or waitlist control group. There was a significant difference in diabetes-related distress scores between the intervention and waitlist control group, at post-intervention and follow-up. Internal shame scores significantly changed at post-intervention, but no other secondary outcome measures demonstrated change. Acceptability data indicated that the intervention was helpful from most post-intervention completers, though the intervention group had greater attrition than the control group.

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HETASHI BAWA

Section A:

A systematic review exploring the effectiveness and acceptability of digital, self-compassion interventions for adults with chronic physical health conditions.

Word Count: 7896 (157)/8000

For submission to Internet Interventions.

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Abstract

Background: Individuals with a Chronic Physical Health Condition (CPHC) may experience ongoing challenges with physical and psychological wellbeing. Psychological therapies are offered to this population and literature is emerging to indicate that compassion-focused interventions may be useful. This review sought to assess the evidence-base for the effectiveness and acceptability of digital, self-compassion interventions for individuals with CPHCs.

Methods: A quantitative, systematic review of five databases (four published, one unpublished) elicited 12 studies that met inclusion criteria. Studies were assessed for quality using the Effective Public Healthcare Practice Project tool. Data was extracted and narratively synthesised.

Results: Included studies were of a weak (n=7) or moderate quality (n=5), with samples of chronic pain, visible skin conditions, breast cancer survivors, type two diabetes mellitus, coeliac disease and mixed CPHC populations. Findings suggested preliminary evidence for the effectiveness and acceptability of digital, self-compassion interventions in CPHCs, particularly in people with chronic pain and breast cancer survivors. This was reflected in the change of self-compassion, psychological and condition-specific outcome measures, along with reported satisfaction and adherence.

Discussion: Given the preliminary findings, digital, self-compassion interventions appear to be effective and acceptable for some CPHCs. Suggestions for future research have been made in the context of the reported strengths and limitations of this systematic review.

Keywords: Self-compassion, digital technology, chronic physical health conditions, acceptability.

Introduction

Chronic Physical Health Conditions (CPHCs)

CPHCs encompass a broad range of presentations which can be subject to variation within medical and research fields (Bernell & Howard, 2016). It has been suggested that physical health conditions would meet the CPHC criteria if the diagnosis or symptoms have been persistent for longer than a year and could require ongoing healthcare input (Krahn et al., 2021; NHS, 2023).

The World Health Organisation (WHO; 2023) uses the term "non-communicable diseases" for people who have a CPHC, and they recognise that a multitude of factors could be associated with the development of conditions, including behavioural choices, wellbeing, and socioeconomic factors (Terry & Leary, 2011; Wagner & Brath, 2012). They also emphasise that CPHCs are experienced by a range of individuals (WHO, 2023).

Impact of CPHCs on Mental and Physical Health

Literature indicates that there are significant emotional and financial impacts of CPHCs on individuals, carers, and healthcare resources (Naylor et al., 2012). It has been widely reported that the presence of one or more CPHC can impact one's mental health (Dekker & De Groot, 2018) and subsequently impact further physical wellbeing (Goodwin et al., 2010).

Supporting individuals to manage CPHCs has been a longstanding priority for healthcare services (Goodwin et al., 2010). However, the improvements in wellbeing and outcomes are placed on the individual adhering to self-management for a CPHC (Coulter et al., 2013; Riegel et al., 2021). This presents a dichotomy between the 70% expenditure on CPHCs within the National Health Service (NHS) and the minimal time that service users spend with healthcare professionals (Barker et al., 2018).

Within the NHS, there is an emphasis on improving the mental health of those with CPHCs given the bidirectional relationship between mental and physical health (National Collaborating Centre for Mental Health, 2018; Panchal et al., 2020). Typically, Cognitive Behavioural Therapy (CBT) would be offered to those with CPHCs that have an established evidence-base for use of the psychological intervention (Marks, 2018). However, literature is emerging to suggest that there are limitations to CBT interventions as there were reduced anxiety and depression recovery rates in clinical services for individuals with CPHCs, and outcomes were further reduced when considering diverse ethnicity and socioeconomic status (Seaton et al., 2022). Therefore, more understanding, innovation, and adjustment to standard psychological treatment must be considered to improve outcomes of psychological interventions for people with CPHCs.

There has been evidence to suggest that the format of psychological therapy could be altered to reach more people with CPHCs, whilst ensuring that access to support is received promptly and psychological interventions consider the impact of having a CPHC (Anderson & Ozakinci, 2018; Lee et al., 2023; Narasimhan et al., 2023). Systematic reviews report that individuals with CPHCs experienced improvements from internet-based, self-help interventions (Beatty & Lambert, 2013; Mikolasek et al., 2017; Wang et al., 2020), which could be offered as health promotion interventions or whilst individuals await intervention from trained psychological professionals. Therefore, emerging findings suggest that there could be scope to consider alternatives to psychological support, beyond the existing face-to-face and traditional therapies that are offered.

Compassion in the Context of CPHCs

The application of psychological interventions that emphasise compassion have been associated with benefits to mental and physical health (Kirby et al., 2017). Literature has conceptualised compassion as “a sensitivity to suffering with the commitment to alleviate and

prevent this suffering" (Gilbert, 2017a, p.31; Kirby et al., 2019). This definition has informed the widely known transdiagnostic approach of Compassion Focused Therapy (CFT), which has contributed to a developing evidence-base of subsequent compassion-based interventions and strategies (Kirby, 2016). The model proposes that compassion has three "flows": to self, to others, and from others (Kirby et al., 2019, p. 26). Interventions arising from a CFT focus include the cultivation of self-directed compassion, known as self-compassion (Kirby, 2016).

A systematic review exploring the use of compassionate interventions in CPHC populations demonstrated that compassion-based interventions could improve mental wellbeing, self-compassion, and quality of life (QOL; Austin et al., 2021b). From a broad review of the literature, it was indicated that experiences of burden (Baumeister et al., 2022), blame (Callebaut et al., 2017), shame (Finlay-Jones et al., 2023a), self-criticism (Austin et al., 2021a), reduced mental wellbeing (Austin et al., 2021b) or reduced self-compassion (Finlay-Jones et al., 2023a) may arise with a new, or longstanding CPHC. With knowledge of the challenges that arise with CPHCs and an emphasis on self-management, perhaps there is a possibility to consider the benefits of offering self-compassion interventions (Allen & Leary, 2010; Hughes et al., 2021).

Self-Compassion and CPHCs

Interventions improving self-compassion have effectively been used by the general public (Halamová et al., 2020; Northover et al., 2021), and those with mental health conditions (Maner et al., 2023; Millard et al., 2023). Within the literature, it has been suggested that self-compassion interventions are an important factor to consider for individuals with CPHCs (Terry & Leary, 2011) because systematic reviews report that higher levels of self-compassion are associated with improved mental wellbeing (Hughes et al., 2021; Misurya et al., 2020; Morgan et al., 2020).

Theoretical models offer insight into the potential interplay between self-compassion and CPHCs. The self-regulation resource model (SRRM; Sirois, 2015) suggests that those with greater self-compassion have healthier behaviours relating to their CPHC due to improved self-regulation of negative affect (Cha et al., 2022). Alternatively, the strength model of self-regulation (SMSR; Baumeister & Heatherton, 1996) suggests that individuals with self-compassion skills do not view setbacks related to the CPHC with a self-critical stance, but they respond kindly, allowing for positive and adapted behaviours related to challenges they faced (Cha et al., 2022). Despite the limited understanding, direct pathways have also been proposed connecting self-compassion and physiological improvements (Slivjak et al., 2023). These theories provide a useful interpretation for the role of self-compassion within interventions, given the commonality in compassion approaches which aim to reduce suffering and improve self-compassion, irrespective of the varying definitions (Strauss et al., 2016).

Self-Compassion Interventions for CPHCs

Research has begun assessing the feasibility of face-to-face self-compassion interventions for adults with CPHCs. Notably, Friis et al's. (2016) eight-week Mindful Self-Compassion (MSC) group intervention significantly reduced depression and diabetes distress, whilst improving physiological diabetes control and self-compassion in people with Type 1 and 2 Diabetes Mellitus (T1DM; T2DM). Another MSC intervention was deemed to be acceptable by individuals with cancer and findings indicated improvements of depression, self-compassion, loneliness, mindfulness, and fear of reoccurrence (Brooker et al., 2019). In a fibromyalgia population, a combination of treatment as usual with Attachment-Based Compassion Therapy, which involved facets of self-compassion, was effective in improving the health status of individuals (Montero-Marín et al., 2018). When comparing psychological therapies in chronic pain participants, greater self-compassion improvements, pain

acceptance, and reduced anxiety were observed with MSC, in comparison to CBT (Torrijos-Zarcero et al., 2021).

Systematic reviews of self-compassion interventions indicate that they are effective in increasing psychological and physiological wellbeing and self-compassion within CPHC populations (Kılıç et al., 2021; Mistretta & Davis, 2021). Another recent systematic quality review considered the efficacy of compassion-based digital smartphone applications that are available to improve mental health in the general public (Krijger et al., 2023). Whilst the review was not specific to improving mental health within a CPHC population, it proposed that good quality compassionate digital applications which are consistent with established self-compassion interventions, could be relevant to a range of individuals who would like to improve self-compassion, or those experiencing high shame and self-criticism (Krijger et al., 2023). Although research related to CPHCs and self-compassion continues to develop, a review on the available digital, self-compassion interventions has not yet been conducted. This contributes to a gap in the literature for our understanding of the innovative use of digital, self-compassion interventions within this population.

Rationale and Research Question

The rationale for conducting this review was to understand the effectiveness and acceptability of digital, self-compassion interventions for people with CPHCs. Effectiveness and acceptability in the context of this review were considered from the quantitative changes in self-compassion, psychological, or condition-specific outcome measures, along with quantitative measures of participant experiences, to enable comparison with literature reviews of self-compassion interventions. Therefore, this systematic review aimed to address the following research question: what is the effectiveness and acceptability of digital, self-compassion interventions for people with CPHCs?

Methods

Review Design

A systematic review was conducted to generate, appraise, and synthesise literature in accordance with inclusion and exclusion criteria (Booth et al., 2016; Grant & Booth, 2009). Whilst a mixed-design systematic review could potentially explore the research question thoroughly, the research team acknowledged the challenges and biases that could arise in meaningfully interpreting both qualitative and quantitative data (Halcomb et al., 2023). Aligning with the research question, a narrative synthesis of quantitative data (Higgins et al., 2019) was conducted to assess the effectiveness and acceptability of digital, self-compassion interventions in CPHCs. Protocol for writing a systematic review were followed (Perestelo-Pérez, 2013). The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist and Synthesis Without Meta-analysis (SWiM) extension have been reported in Appendix A (Campbell et al., 2020; Page et al., 2021).

Inclusion and Exclusion Criteria

The PICOS format (Caldwell et al., 2012; Perestelo-Pérez, 2013) was used to establish and define inclusion and exclusion criteria for this systematic review (Table 1).

Participants

To establish an inclusive list of health conditions that classified as a CPHC, previous systematic review populations were considered (Austin et al., 2021b; Kılıç et al., 2021), together with Chapters 2-5, 8-17 and 19 of the International Classification of Diseases-11 criteria (ICD-11; World Health Organisation, 2022). Replicating previous literature, cancer survivors were included as having a CPHC given the ongoing impact on their physical health (Phillips & Currow, 2010). Although the ICD-11 (WHO, 2022) has been published with a change to the categorisation of fibromyalgia, this was also considered to be a CPHC if the

study recruited at the time of ICD-10 criteria (WHO, 1993). Studies with CPHC populations who met the above criteria were included if they had adult participants (≥18 years old).

Intervention

Digital health interventions are characterised by "use of information and communications technology" to improve health and wellbeing (WHO, 2019, p.9). Literature considers digital interventions as: mobile applications, telecommunication (texts and emails), websites, online programmes, or online delivered self-help (Fleming et al., 2018; Sasseville et al., 2021). To be included in this review, digital interventions must have had a component of self-compassion. Studies were not limited to specific self-compassion definitions or approaches, intervention duration, or number of sessions, to allow for comparison of interventions used in CPHC populations.

Comparator

The inclusivity of this review meant that there was a range of CPHCs that could be included. Studies were also included whether they had an active, waitlist, or no control group.

Outcomes

Data that was deemed necessary included: demographic characteristics, intervention characteristics, quantitative measures of effectiveness from statistical analysis of outcome measures (self-compassion, psychological or condition-specific measures), and quantitative measures of acceptability (adherence, attrition, or satisfaction).

Although there was no formal guidance on the evaluation of acceptability, despite being influenced by wide-ranging factors in research (Craig et al., 2008, 2018), guidance was recently published for the evaluation of complex interventions which suggested analysing changes in outcome measures and contextual processes that contributed towards the change (Skivington et al., 2021; Thomas et al., 2023). Therefore, this review defined effectiveness as the outcomes observed after the population of interest received an intervention (Moore et al.,

2015; Skivington et al., 2021), and acceptability was defined as the suitability or relevance of the intervention for the population that were intended to receive a desired outcome (Feeley et al., 2009; Simon et al., 2001; Thomas et al., 2023).

Exclusion criteria were not applied to studies that did not include a self-compassion measure. Rather, they remained included if an appropriate measure was used relating to the aim of the project and intervention. In the case of no self-compassion measure, nor other relevant outcome measures, the study was excluded. Studies that collected mixed data were only included if the aforementioned quantitative data was reported.

Study Design

In line with the research question, studies were included if they used an experimental or observational design to evaluate the digital, self-compassion intervention (NICE, 2012). Exclusion criteria was applied to studies that used other designs or qualitative analysis for outcomes of a digital, self-compassion intervention.

Table 1

Inclusion and Exclusion Criteria

PICOS	Inclusion	Exclusion
Participants/ Population	Adults (≥ 18 years old). CPHC as defined by ICD-11 criteria, non-communicable diseases (WHO, 2023) and previous literature.	<18 years old No CPHC. Mental health population. General public population.
Intervention	Digital intervention (WHO, 2019). Self-compassion component(s) within intervention.	Non-digital/Group/Videoconference self-compassion intervention. Interventions with no self-compassion components.
Comparator	Various CPHCs (WHO, 2023). Active control/Waitlist control/No control.	-

Outcomes	Intervention effectiveness outcome measures (self-compassion/ psychological/condition-specific). Intervention acceptability outcomes (adherence/attrition/satisfaction).	Only qualitative outcomes. Absence of self-compassion and relevant quantitative outcome measure.
Study Design	Quantitative. Experimental/Observational designs to assess intervention e.g., RCT/Cohort studies (NICE, 2012). Mixed designs meeting PICOS criteria.	Qualitative. Cross-sectional/Case study/Focus groups.

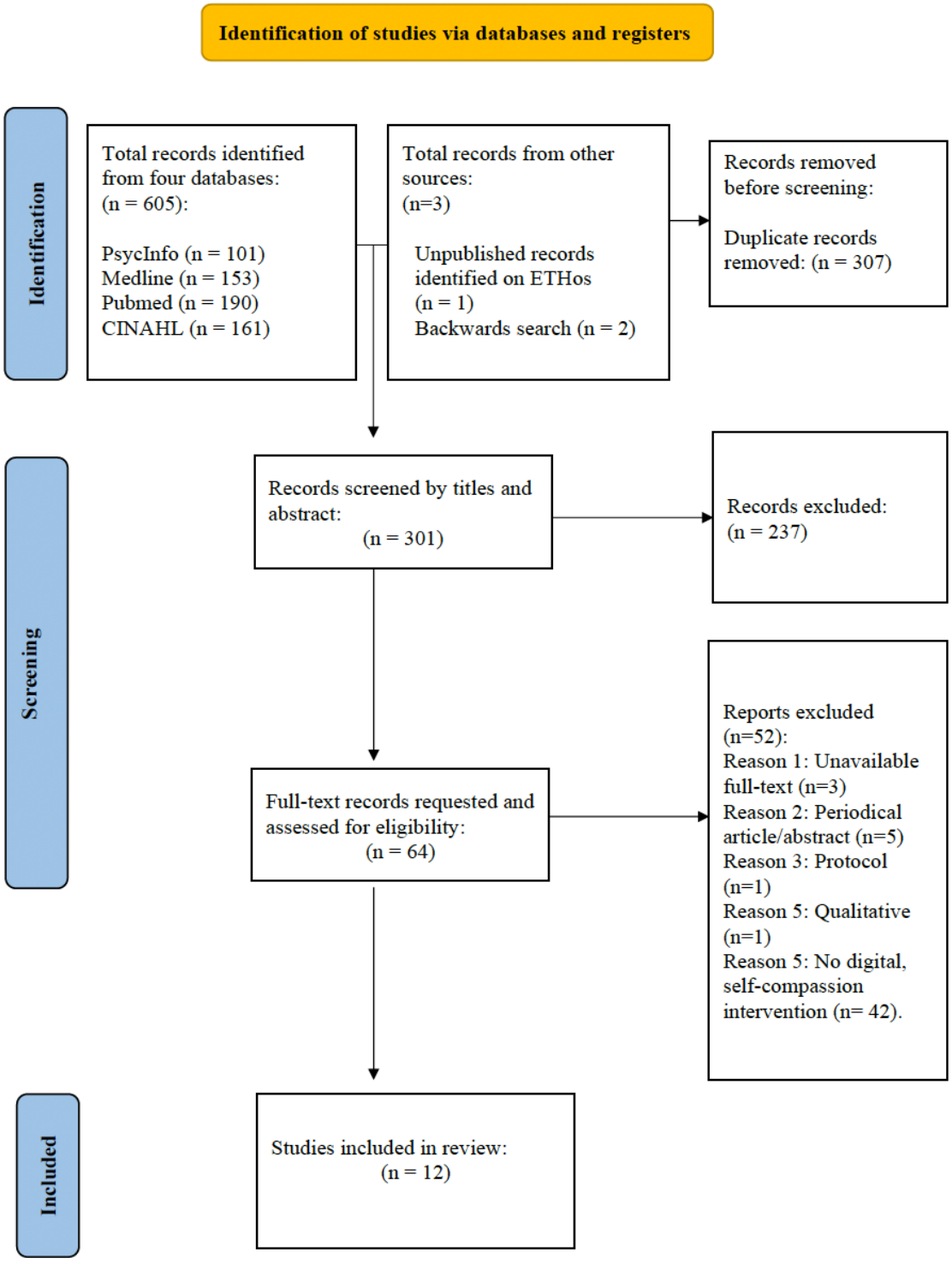
Procedure

Databases

Four published databases (PsycInfo, Medline, CINAHL, PUBMED) were searched as part of the systematic review. English language limitations were applied, however no date limitations were used for these databases. Relevant, unpublished literature from the ETHoS database was also searched and included as part of this review to prevent publication bias (Lefebvre et al., 2023). Included studies underwent backwards searching. Forward searching was facilitated by Google Scholar, though no studies were identified. Figure 1 indicates the PRISMA flowchart (Page et al., 2021). The final search took place on 29th September 2023.

Figure 1

PRISMA Flowchart (Page et al., 2021)



Search Terms

Search terms and synonyms were derived from the PICOS criteria, relevant systematic reviews, and literature (Austin et al., 2021b; Ferrari et al., 2019; Kılıç et al., 2021; Kirby, 2016). Searches for published databases were nested using the 'AND/OR' function to identify relevant titles for this review. They were entered as [type of compassion] AND [type of digital intervention] AND [CPHC] (Table 2). The unpublished database underwent a title search with the terms 'intervention' OR 'training' AND 'compassion'.

Table 2

Search Terms for Published Databases

Area of Interest	Search Terms
Compassion	compassion* OR self?compassion* OR compassion?focussed therapy* OR compassion?focused therapy* OR compassion?focused* OR compassion?focussed* OR compassion?based OR compassionate mind training* OR mindful self?compassion* OR compassion cultivation training* OR cognitively?based compassion training* OR attachment?based compassion therapy* OR writing intervention* **AND**
Digital Intervention	online* OR digital* OR virtual* OR web* OR web?based* OR website* OR internet* OR internet?based* OR app OR m?health* OR program* OR programme* OR training OR intervention OR randomi?ed controlled trial* OR rct* OR randomi?ed trial* OR fea?ibility* OR pilot OR self?help* **AND**
CPHC	physical health* OR chronic health* OR chronic health condition* OR chronic condition* OR chronic illness* OR chronic disease* OR long?term health condition* OR long?term illness* OR long condition* OR long?term disease* OR disease OR cancer* OR carcinoma* OR tumour* OR blood disorder* OR anemia* OR leukemia* OR HIV* OR autoinflammatory* OR immunodeficiency* OR asthma* OR allergy* OR diabetes* OR hypothyroidism* OR overweight* OR obesity* OR rheumatoid* OR epilepsy* OR parkinsons* OR multiple sclerosis* OR motor neuron disease* OR cerebral palsy* OR myalgic encephalomyelitis* OR chronic pain* OR pain* OR chronic fatigue* OR fibromyalgia OR parkinsons disease* OR fatigue* OR alzheimers* OR cystic fibrosis* OR COPD OR chronic obstructive pulmonary disease* OR pulmonary disease* OR heart* OR cardiac* OR coronary* OR emphysema* OR liver disease* OR lung disease* OR crohns disease* OR ulcerative colitis* OR inflammatory bowel* OR irritable bowel syndrome* OR hypertension* OR coeliac disease* OR celiac disease* OR skin disorder* OR skin condition* OR dermatitis* OR eczema* OR psoriasis* OR osteoarthritis* OR arthritis* OR back pain* OR endometriosis* OR sexual pain* OR kidney disease* OR kidney failure*

Data Extraction

A spreadsheet was developed for this review. Firstly, duplicates were removed. Records were excluded if they were not relevant at the screening stage, identified by title and abstract screening. For the remaining articles, the full-text was reviewed. Eligible studies were included within this review based on inclusion criteria, whilst non-eligible studies were excluded with reasons. As eligibility was assessed independently, the author consulted the research supervisor to establish agreement for inclusion into this review. As agreement was achieved, data was extracted from the full-texts and supplementary material in a tabular format, and the narrative synthesis was structured by effectiveness and acceptability outcomes. Finally, quality appraisal was conducted by the author for all included studies.

Quality Appraisal

The Effective Public Health Practice Project (EPHPP) tool was used to assess the quality of the studies included within the review (Thomas et al., 2004). This was deemed to be a suitable tool as it assessed a range of quantitative study designs, applying the same rigour to all included studies within this systematic review (Armijo-Olivo et al., 2012).

The EPHPP tool has six domains that can be utilised by independent raters to assess on a scale of strong, moderate, or weak. Each of the scores from the domains are totalled to generate an overall global rating. Lower scores on the global rating are indicative of a greater study quality. To achieve a strong global rating, studies must not have any weak domain ratings. Moderate global ratings must only have one weak domain rating, whilst weak global ratings are obtained by studies that have two or more weak domain ratings. Although the EPHPP tool has a dictionary to support researchers with scoring, to allow for replication, the researcher declared calculations and adaptations that were made in specific domains (Table 3).

To consider how effectiveness and acceptability could be impacted by study quality, studies were not excluded from narrative synthesis based on the overall quality rating. Quality appraisal was conducted independently and through research supervision, agreements for ratings were established.

Table 3

EPHPP Tool Adaptations

Domain & Question	**Adaptation**
Selection Bias (Q2)	If the percentage of people agreeing to participate was not reported, the researcher divided the number of randomised/allocated participants by the number of consenting participants and multiplied by 100.
Confounders (Overall rating of Q1 & 2)	Below descriptions were used to rate studies that reported and controlled confounders: Strong ratings: obtained by studies that analysed and reported no significant baseline group differences. Moderate ratings: obtained by studies that identified significant baseline group differences and used appropriate analysis to control for these variables. Weak rating: obtained by studies that did not report analysis of baseline differences or differences were established, yet control of these variables was not reported.
Withdrawals and Drop-Outs (Q2)	The researcher divided the number of remaining participants at the final timepoint by randomised/allocated participants and multiplied by 100 to identify the percentage of participants completing the study and attrition rates, if these were not reported.

Results

Included Studies

The systematic search yielded a total of 608 papers. Through the title and abstract screening process, 237 papers were excluded. 64 papers underwent a full-text screening, where 52 papers were excluded based on criteria. Table 4 provides a summary of the 12 studies that were included in this review.

When comparing the research, ten studies recruited specific CPHC populations, whilst two studies recruited mixed CPHCs. The most prominent CPHCs were chronic pain (n=3) and skin conditions (n=3). Studies were published between 2017-2023, indicating that some recruitment would have taken place over the Coronavirus pandemic. Most of the studies were conducted in United Kingdom (n=5), and they typically used a randomised controlled trial (RCT) design (n=9). Of these RCTs, three were termed pilot studies, four were feasibility studies, and one was a combined pilot and feasibility study. Limited studies were identified to be pre-registered (n=4).

There were 1314 participants included in the systematic review. Demographics indicated that all studies recruited more females (88%) than males (12%; n=160). All studies reported the mean age, apart from Muftin et al. (2022) who categorised ages. In this review, the mean age range was between 27.13-60.88 years old, with a median age of 46.95. Studies that reported ethnicity characteristics (n=6), primarily had White backgrounds.

Table 4

Study Characteristics and Findings

	Author, Year and Location	Aim(s)	Methods	Statistical Analysis	Results
1	Carvalho et al. (2022) Portugal.	To compare acceptability and efficacy of online Acceptance and Commitment Therapy (ACT) and Compassion Focused Therapy (CFT) at four time points.	**Study Design:** Randomised Controlled Trial: pilot. Pre-registered trial. **Participants:** Multiple conditions (N=49). All Portuguese. Female (N=42). Male (N=7). Mean age: 43.2. **Type of compassion:** Untailored CFT (N=24) vs. ACT (N=25). **Type of digital intervention:** Online platform with reminders. **Duration of intervention:** Four weekly 20-minute sessions and between-session meditation. **Outcome Measure Intervals:** Baseline (T0), post intervention (T1), three-month follow-up (T2) and six-month follow-up (T3). **Self-Compassion Measure:** Self-Compassion Scale (Neff, 2003). Means of sub-scales used. **Psychological Measures:** HADS (Zigmond & Snaith, 1983); CISS (Trindade et al., 2017); CFQ-CI (Trindade et al., 2018); CompACT (Francis et al., 2016; Trindade et al., 2021).	**Acceptability:** Descriptive and frequency analysis of questionnaire relating to intervention. **Efficacy and Differences:** Clinically significant change measured through reliable change indices (RCI) for outcome measures. Compared levels of change using Fishers exact tests. Intention-to-treat for attrition analysis using linear models.	**Attrition:** Around 50% at post-intervention. At T3 follow-up: CFT (N=7) vs. ACT (N=8). **Both Interventions:** No significant differences between participants in either group. RCI values for clinical significance were not significantly different for either group. Post-hoc analysis indicated significant decrease in uncompassionate self-responding from T0 and T3. No significant differences in interventions. **ACT Only:** 100% acceptability of intervention and session duration. Significant reductions in illness-related shame at T1 and T2 and T2 and T3. Significant increase in valued action at T0 and T1. **CFT Only:** 75% acceptability of overall duration and 62.5% for session duration. Significant reduction in illness-related shame from T0 and T1, till study end. Significant increase in valued action at T0 and T3. Significant increase in psychological flexibility T0 to T1.

2	Dhokia et al. (2020) United Kingdom.	To conduct a pilot trial of online Compassionate Mind Training (CMT) to assess acceptability and effectiveness for respective population.	**Study Design:** Randomised Controlled Trial: pilot. **Participants:** Chronic pain (N=73). No ethnicity demographics reported. Female (N=48), Male (N=25). Mean age: 45.53. **Type of compassion:** Tailored CMT (N=39) vs. Relaxation music (RM; N=40). **Type of digital intervention:** Online platform with reminders. **Duration of intervention:** Twenty days of daily 10–15-minute sessions. **Outcome Measure Intervals:** Baseline (T0), post-intervention (T1) and one-week follow-up (T2). **Self-Compassion Measure:** Not measured. **Psychological Measure:** FSCRS (Gilbert et al., 2004). **Condition-specific Measures:** LDQ (Raistrick et al., 1994); UPPSS-PS (Whiteside & Lynam, 2009).	**Baseline Differences:** Independent samples t-tests and Chi-Square tests. **Effectiveness:** Repeated measures MANOVA for group, time and GroupXTime interactions. Simple planned contrasts used for post-hoc tests for T0 vs. T1 and T0 and T2. **Acceptability:** Participant retention and completion of exercise.	**Attrition:** Minimal drop out. CMT (N=38) vs. RM (N=35). **Overall:** No baseline differences between groups. Significant interaction for prescription analgesic use (between T0-T1) and analgesic dependence (between T0-T1 and T0-T2) Significant interaction for hated self (self-criticism) and self-reassurance (between T0-T1 and T0-T2). Significant effect of group, time, and interaction for impulsivity measured by urgency, perseveration and sensation seeking. Significant group and interaction effects for negative urgency (between T0-T1 and T0-T2). Significant interaction for perseveration (between T0-T1). Significant interaction for sensation seeking increased in both groups (between T0-T3). **CMT:** Prescribed analgesic use reduced and significantly differed compared with RM group at T1. Analgesic dependence and hated self (self-criticism) both reduced and significantly differed compared with RM group at T1 and T2. Negative urgency reduced and significantly differed to RM group at T1. Lack of perseverance decreased and significantly differed with RM group at T1 and T2. Sensation seeking increased and significantly differed with RM group at T3.

3	Hudson et al. (2020) United Kingdom.	To examine attrition and adherence rates of the Compassion Focused Therapy (CFT) based intervention for respective population. To estimate whether the intervention reduced psychological outcomes and increased CPHC-specific quality of life and self-compassion. To investigate whether demographic variables or outcome measures impacted drop out.	**Study Design:** Randomised Controlled Trial: feasibility. **Participants:** Diagnosed skin conditions (N=176) White British – 77.84% (N=137). Female (N=151), Male (25). Mean age: 33.81. **Type of compassion:** Tailored CFT-based self-help and daily practice of mindful soothing rhythm breathing (MSRB) using MP3 vs. Waitlist control. **Type of digital intervention:** Emailed self-help written workbook with MP3 of MSRB. Reminder emails every three days. **Duration of intervention:** Two weeks of daily eight-minute MP3. **Outcome Measure Intervals:** Baseline (T1), one-week into intervention (T2), post-intervention (T3). **Self-Compassion Measure:** Self-Compassion Scale-Short-Form (Raes et al., 2011). Mean total score used. **Psychological Measures:** PSS (Cohen & Williamson, 1988); HADS (Zigmond & Snaith, 1983). **Condition-specific Measure:** Dermatology Life Quality Index (DLQI; Finlay & Khan, 1994).	**Baseline Differences:** Independent samples t-tests and Chi-Square tests. **Differences:** MANOVA for non-completers vs. completers. ANCOVA for difference between intervention and control group at time 3. ANCOVA's repeated for Intention-to-treat analysis with imputation. **Relationships:** Correlations to investigate whether MSRB practice was associated with outcome measures.	**Attrition:** 50.57% did not complete. At time 3, 87 participants remained (Intervention=26; Control=61). No significant differences were identified between completers vs. non-completers, or whilst considering demographic factors. **Adherence:** 19 participants reported total adherence to intervention. 15.79% of these participants used the breathing on 11> days and 78.95% of participants used the breathing on half of the days. Median practice: 9 days. **Overall:** Between-group ANCOVA reported that the intervention had significant moderate effect on levels of stress, anxiety, depression, and self-compassion at T3. Independent t-test showed greater intervention participants had DLQI improvement when groups were compared. ITT reported significant small effect of intervention on levels of stress, anxiety, and depression. Independent t-test showed greater change in self-compassion in intervention than control group. Large, negative correlation between greater practice and anxiety. Medium, negative correlation between greater practice and DLQI score.

4	Sherman et al. (2019) Australia	To assess feasibility of 'MyChanged Body' (MyCB) within skin condition population.	**Study Design:** Cohort analytic. Pre-registered study. **Participants:** Visible skin conditions (N=50). No ethnicity demographics reported. Female (N=35), Male (N=15). Mean Age: 27.13. **Type of compassion:** Tailored structured self-compassion writing vs. Control (unstructured writing). **Type of digital intervention:** Online platform. **Duration of intervention:** One session (30 minutes). **Outcome Measure Intervals:** Baseline and post-intervention. **Self-Compassion Measure:** Self-Compassion Scale-Short-Form (Raes et al., 2011). Mean total score used. **Psychological Measure:** PANAS (Watson et al., 1988). **Condition-specific Measure:** Body Image Disturbance Questionnaire (BIDQ; Cash et., 2004b).	**Baseline Differences:** Chi-square and t-tests. **Differences:** Repeated-measures ANCOVA for each outcome measure at follow-up by condition. ANCOVA identified GroupXTime interactions.	**Attrition:** None. **Overall:** Demographic differences between groups and thus gender, age, education, and perceived symptom severity were included as covariates. Baseline BIDQ was a pre-specified covariate in the analysis. BIDQ scores were high in this current sample. Significant interaction effect in intervention group for self-compassion and negative affect. Therefore, there were significantly greater self-compassion and improved negative affect scores at post-intervention in intervention condition. No significant difference in positive affect from intervention or control.

5	Mifsud et al. (2021) Australia and United Kingdom	To assess feasibility of 'MyChanged Body' (MyCB) within breast cancer survivor population, given the addition of self-compassion meditation. Determine uptake and adherence of MyCB.	**Study Design:** Randomised Controlled Trial: feasibility and pilot. Pre-registered trial. **Participants:** Female breast cancer survivors (N=108). No ethnicity demographics reported. Mean ages between groups: 57.54, 60.88, 57.39. **Type of compassion:** Tailored self-compassion writing (MyCB) vs. self-compassion writing & meditation (MyCB+M) vs. active control (expressive writing). **Type of digital intervention:** Online platform. Daily reminders for MyCB+M group. **Duration of intervention:** 30-minute writing exercise. Five-minute daily meditation included for MyCB+M for three weeks. **Outcome Measure Intervals:** Baseline, post-intervention and one-month follow-up. **Self-Compassion Measures:** Self-Compassion Scale-Short-Form (Raes et al., 2011). Mean total score used; Self-Compassionate Attitude (Przezdziecki & Sherman, 2016). **Psychological Measures:** PANAS (Watson et al., 1988); DASS (Lovibond & Lovibond, 1995). **Condition-specific Measures:** BIS (Hopwood et al., 2001); BAS (Avalos et al., 2005).	**Baseline Differences:** Chi-square and ANOVA. **Differences:** Intention-to-treat for all allocated to a group. Sensitivity analysis for participants who adhered to condition. Analyses identified group, time and GroupXTime interactions. **Feasibility:** Reported as study uptake with baseline questionnaire completed. **Adherence:** Number of steps completed in the intervention. **Acceptability:** Researchers developed measure. **Note:** MyCB and MyCB+M results were combined in post-intervention intention-to-treat analysis.	**Total Uptake:** 70% (N=79) **Total Adherence:** 51%. **Acceptability of MyCB+M:** 79% agreement of activity being appealing, 74% agreement of being comfortable with activity, 79% agreement of the instructions being easy to understand and 67% for being happy to do the activity again. **Overall:** Breast surgery complications, lymphedema status (demographic) and body appreciation scores (BAS outcome measure) were significantly different across conditions at baseline and therefore were covariates. Significant interaction at post-intervention for self-compassionate attitude scores, when comparing MyCB (combined groups) to active control. Significant main effect of time at follow-up for body image distress (BIS outcome measure) and trait self-compassion scores in all conditions. Sensitivity analysis showed significant interaction at post-intervention for self-compassionate attitude and positive affect. Sensitivity analysis showed main effect of body image distress and interactions for trait self-compassion and anxiety at follow-up. Interactions indicated improvements in MyCB+M condition, compared to MyCB.

6	Dowd et al. (2023) (Part 2). Canada.	Assessing feasibility of 'Promotion of Optimal Well-being, Education and Regulation for Coeliac Disease' (POWER-C) programme. Assessing effect of intervention on behavioural and psychological outcomes.	**Study Design:** Randomised Controlled Trial: feasibility. **Participants:** Coeliac disease (N=251). No ethnicity demographics reported. Female: 85%. (Between groups there were N=69, 66 and 67 females). Mean age: 44.26. **Type of compassion:** Tailored self-regulation (SR) vs. SR and self-compassion (SC) vs. waitlist control. **Type of digital intervention:** Online platform with reminders. **Duration of intervention:** Eight weeks of 20-minute sessions. **Outcome measure intervals:** Baseline, post-intervention, and follow-up (six months). **Self-Compassion Measure:** Self-Compassion Scale (Neff, 2003). Mean total score used. **Psychological Measures:** Self-Regulatory Efficacy (SRE; (Strachan & Brawley, 2008); Concurrent Self-Regulatory Efficacy (CSRE; Jung & Brawley, 2013); STAI-T (Spielberger et al., 1970); SRDS-20 (Zung, 1965). **Condition-specific Measures:** Coeliac Dietary Adherence Test (CDAT; Leffler et al., 2009); Coeliac Disease-Specific Quality of Life (CD-QoL; Dorn et al., 2010).	**Differences:** Generalised estimating equations (GEE) for between-group changes and interactions. GEE analysis with covariates (baseline CDAT and Self-compassion). **Feasibility:** Assessed by rate of recruitment, attendance, attrition, and intervention completion.	**Attrition:** 62.5% were lost to follow-up whilst 9.96% dropped out. **Feasibility:** "Somewhat feasible" established by attrition and completion rates. **Overall:** No significant differences between groups for demographics. There were significant differences identified in CDAT and self-compassion scale scores, where analysis was conducted controlling for baseline scores. Significant main effect of time for CDAT, CD-QOL, SRE, CSRE, at post-intervention and follow-up for all participants. Significant main effect of time for anxiety (STAI-T) and depression (SRDS-20), only at post-intervention. Significant interaction for self-compassion. SR+SC group had significant increase in self-compassion between baseline and follow-up timepoint. Significant negative correlations between CDAT with CD-QOL, self-compassion, SRE and CSRE. Significant positive correlations between CDAT with anxiety (STAI-T) and depression (SRDS-20). Significant positive correlations between CD-QOL and self-compassion and CSRE. Significant positive correlations between self-compassion and SRE and CSRE. Significant negative correlations between CD-QOL and anxiety and depression. Significant negative correlations between self-compassion with anxiety and depression.

7	Basque et al. (2021) Canada.	Assessing feasibility of a self-compassion website.	**Study Design:** Cohort study. **Participants:** Chronic Pain (N=26) No ethnicity demographics reported. Female (N=23), Male (N=3). Mean age: 57.5 years. **Type of compassion:** Self-compassion. **Type of digital intervention:** Untailored website programme with self-compassionate writing relating to pain, with reminders. **Duration of intervention:** Six weeks of 30-minute writing task. **Outcome Measure Intervals:** Baseline (T1), post-intervention (T2) and three-month follow-up (T3). **Self-Compassion Measure:** Self-Compassion Scale-Short-Form (Raes et al., 2011). Mean total score used. **Psychological Measures:** GAD-7 (Spitzer et al., 2006); PHQ-9 (Kroenke et al., 2001). **Condition-specific Measures:** PRS (Slepian et al., 2016); CPAQ-8 (Baranoff et al., 2014); NRSPI (Haefeli and Elfering, 2006); PCS (Sullivan et al., 1995); IIRS (Devins, 2010).	**Baseline Differences:** Chi-square tests and t-tests for completers vs. non-completers. **Differences:** Intention-to-treat mixed effect model analysis for comparison across three time points. **Feasibility:** Recruitment, adherence, and attrition. **Acceptability:** Satisfaction.	**Attrition:** 42% of participants dropped out. **Uptake:** 58% of participants completed the post-intervention. 80% of completers completed 4-6 sessions. **Adherence:** 23% of participants adhered to full treatment protocol. No significant differences reported between study completers vs. non-completers. **Acceptability:** High treatment satisfaction – 93%. **Overall:** Significant effect of time for self-compassion between T1 and T2. Significant effect of time on pain resilience (PRS) between T1 and T2 which were maintained at T3. Significant effect of time on chronic pain acceptance (CPAQ-8) between T1 and T3. Significant effect of time in pain over time. Decreased between T1 and T2 and increased between T2 and T3. Significant effect of time in pain catastrophising scale (PCS) with improvements between T1 and T2 and T2 and T3. Significant effect of time on anxiety (GAD-7) and depression (PHQ-9) between T1 and T2, maintained at T3. No significant time effects of illness intrusiveness (IIRS).

8	Ziemer et al. (2017) United States of America.	Determine whether the writing conditions differed in responses and whether this differed based on pain catastrophising. Determine changes in self-compassion within writing conditions and the effect upon psychological and physical outcomes	**Study Design:** Randomised Controlled Trial: pilot. **Participants:** Chronic pain (N=93). White ethnicity – 93.5%. Female: 86%. Mean age: 49.6. **Type of compassion:** Tailored self-compassion vs. self-efficacy writing exercise. **Type of digital intervention:** Emailed link. **Duration of intervention:** 20-minute writing task. Once a week over three weeks. **Outcome Measure Intervals:** Baseline and post-intervention. **Self-Compassion Measure:** Self-Compassion Scale-Short-Form (Raes et al., 2011). Mean total score used. **Psychological Measures:** CESD (Radloff, 1977); SWLS (Diener et al., 1985); PANAS-SF (Kercher, 1992). **Condition-specific Measures:** IIRS (Devins, 2010); PCS (Sullivan et al., 1995); CPSS (Anderson et al., 1995). CPAQ-8 (Baranoff et al., 2014); Self-reported type, duration and location of chronic pain, treatment of pain and pain severity.	**Baseline Differences:** T-test and chi-square tests for group differences. **Differences:** Two-way mixed ANCOVA (with employment status as covariate). Moderated multiple regression to determine differences in outcome measures for pain catastrophising.	**Adherence:** 78.1% in self-compassion condition. 82.7% in self-efficacy condition. **Overall:** Significant difference in baseline employment status between groups. Employment status was a covariate in analyses. Significant interaction established between illness intrusiveness (IIRS) and writing condition. Post-hoc analyses identified that this was an increased trend in the self-efficacy condition. There was a non-significant decrease in illness intrusiveness for the self-compassion condition. Both groups had a significant decrease in average reported pain severity and significant increase in life satisfaction (SWLS) after intervention. Significant main effect for positive affect across the intervention for both groups. Non-significant changes for self-compassion or self-efficacy for either group. A change in self-compassion scores and self-efficacy scores both significantly predicted illness intrusiveness, depression, activity engagement and pain willingness. A change in self-efficacy scores significantly predicted pain severity.

9	Kılıç et al. (2023) United Kingdom	Feasibility and acceptability of online intervention of MSC and ACT for psychological distress.	**Study Design:** Randomised Controlled Trial: feasibility. **Participants:** Type 2 Diabetes Mellitus (N=33). White ethnicity – 84.9% (N=17). Female (N=28), Male (N=5). Mean age: 55.85. **Type of compassion:** Tailored Acceptance, Commitment, and Self-Compassion based treatment in Diabetes (ACSBT-D) programme. (Self-compassion exercises based on ACT and MSC). **Type of digital intervention:** Online portal. **Duration of intervention:** Five weekly 30-minute sessions and optional daily practice. **Outcome Measure Intervals:** Baseline (T1), post-intervention (five-weeks; T2) and follow-up (nine-weeks; T3). **Self-Compassion Measure:** Self-Compassion Scale (Neff, 2003). Mean total score used. **Psychological Measures:** PHQ-8 (Kroenke et al., 2009); GAD-7 (Spitzer et al., 2006); WBQ-12 (Bradley, 1994); AAQ-2 (Bond et al., 2011). **Condition-specific Measures:** PAID (Welch et al., 1997); ADDQoL-19 (Bradley et al., 1999); DSMQ (Schmitt et al., 2013).	**Baseline Differences:** T-test and chi-square tests for group differences. **Size of differences:** Effect sizes reported with Hedges g for within group differences at T1 and T2, T2 and T3 and T1 and T3. **Acceptability:** Qualitative interviews and treatment completion (number of sessions).	**Adherence:** 31.58% completed all treatment sessions. **Overall:** No significant differences between groups in demographic or outcome measures. Medium effects for diabetes distress and self-compassion between T1 to T2. Small effects reported for depression and anxiety, psychological inflexibility, and diabetes wellbeing between T1 and T2. Large improvements between T1 and T3 for self-compassion. Medium improvements between T1 and T3 for diabetes distress. Small improvements for depression, anxiety, and wellbeing between T1 and T3. Wide confidence intervals across both groups.

10	Wolke (2022) United Kingdom	Feasibility and efficacy of Compassionate Mind Training (CMT) intervention.	**Study Design:** Cohort analytic. **Participants:** Multiple conditions (N=21). White British – 52.85% (N=11). Female (N=19), Male (N=2). Mean age: 46.95 years. **Type of compassion:** Untailored CMT (self-compassion focus). **Type of digital intervention:** Online portal with reminders. **Duration of intervention:** Four weeks of 30-minute sessions with materials for practicing over the week. **Outcome Measure Intervals:** Baseline and post-intervention **Self-Compassion Measure:** Self-Compassion Scale-Short-Form (Raes et al., 2011). Total and subscale scores used. **Psychological Measures:** FSCRS (Gilbert et al., 2004); DASS (Lovibond & Lovibond, 1995); EISS (Ferreira et al., 2022); AQoL-6 (Richardson et al., 2013); WHO-5 (Topp et al., 2015).	**Baseline Differences:** Completers vs. non-completers were compared using Mann-Whitney U and Independent t-tests. **Differences:** Wilcoxon-signed rank tests and paired-samples t-tests. **Acceptability:** Satisfaction questions.	**Attrition:** 73.08%. **Adherence:** 100% for those completing sessions, however only 13 participants completed within four-week completion time. Eight participants completed in five or six weeks. **Acceptability:** 90.48% of participants reported satisfaction of the intervention (satisfied and mostly satisfied categories combined). **Overall:** No significant differences reported in completers vs. non-completers in age, demographic characteristics, or outcome measures. Significant increase of self-compassion scores from pre-to-post intervention. This demonstrated large effect sizes for increases in compassionate attitudes and decreases in uncompassionate attitudes. Significant reductions (medium-to-large effect size) in self-criticalness and improvements in self-reassurance. Significant reductions (large effect sizes) in depression, stress, and shame Significant improvement in health-related QOL and wellbeing.

11	Muftin et al. (2022) United Kingdom	Comparison of two self-help interventions to examine outcomes of shame, self-criticism, and quality of life.	**Study Design:** Randomised Controlled Trial: feasibility. **Participants:** Psoriasis (N=130). White (N=110). Female (N=87), Male (N=43). Mean age: Not reported. Greater participants between 26-35 years old. **Type of compassion:** Tailored compassion (CMT) vs Mindfulness-based self-help. **Type of digital intervention:** Emailed self-help book and MP3 access. **Duration of intervention:** Four weeks. **Outcome Measure Interval:** Baseline and post-intervention. **Self-Compassion Measure:** Not measured. **Psychological Measures:** OAS (Allan et al., 1994); FSCRS (Gilbert et al., 2004). **Condition-specific Measures:** Dermatology Life Quality Index (DLQI; Finlay & Khan, 1994).	**Baseline Differences:** Chi-square and MANOVA. **Differences:** Intention-to-treat and completer analysis was conducted using two-way mixed ANOVA for evaluating efficacy of interventions. **Acceptability:** Feedback responses converted to percentages. Chi-square used to explore differences between groups.	**Adherence:** Compassion (N=44; 67%) vs. Mindfulness (N=48; 73%). **Attrition:** Overall attrition was 29%. **Acceptability:** Similar reports for the two interventions. The compassion intervention was easy to follow (Compassion:86% vs. Mindfulness: 96%), helpful (Compassion:74% vs. Mindfulness: 88%) and useful (Compassion: 62% vs. Mindfulness: 60%). **Overall:** No significant differences reported between completers and non-completers or intervention groups on pre-intervention measures, except for prescribed anti-depressants. No significant interaction or main effect of group for two treatment groups in reducing shame. Significant main effect of time for both groups for reduction in shame and hated-self, and improvements in DLQI and reassured-self between T1 and T2.

12	Sherman et al. (2018) Australia.	To assess whether 'MyChangedBody (MyCB) can be combined with usual care (UC) to promote adjustment to bodily changes. To assess whether MyCB+UC reduces psychological distress and improves self-compassion. To assess whether MyCB+UC effects differed based on lymphoedema or increased appearance investment.	**Study Design:** Randomised Controlled Trial. Pre-registered trial. **Participants:** Female breast cancer survivors (N=304). No ethnicity demographics reported. Mean ages between groups: 57.50 and 57.23. **Type of compassion:** Tailored self-compassion writing with usual care (MyCB+UC) vs. expressive writing & usual care (EW+UC). **Type of digital intervention:** Online platform. **Duration of intervention:** Single session (30-minutes). **Outcome Measure Intervals:** Baseline and one-week, one-month, and three-months follow-up. **Self-Compassion Measure:** Self-Compassion Scale-Short-Form (Raes et al., 2011). Mean total score used. **Psychological Measure:** DASS (Lovibond & Lovibond, 1995). **Condition-specific Measures:** BIS (Hopwood et al., 2001); BAS (Avalos et al., 2005); ASI-R (Cash et al., 2004a).	**Baseline Differences:** Chi-square and t-tests. **Differences:** Group, time, and interaction analysis for Intention-to-treat framework. Maximum likelihood models for group, time, interactions, and moderators (lymphoedema status and high appearance investment and age and time since diagnosis). Bootstrapping process for mediation effect of self-compassion.	**Attrition** 9.2%. **Adherence:** 88% of those allocated to MyCB+UC were compliant with all six segments of the single session writing intervention vs. 81% in EW+UC group. **Acceptability:** High adherence and low attrition = support for acceptability. **Overall:** Groups did not significantly differ in demographic characteristics, outcome measures, or attrition rates. However, groups differed in time since breast cancer diagnosis as the MyCB+UC group was significantly higher in this category. Significant interaction for body image (BIS) scores at one-month follow-up. Remained significant for those with lymphedema status and appearance investment. Significant interaction for body appreciation (BAS) score at all follow-up time-points. Significant interaction for self-compassion (at one-week and one-month). No significant interactions for anxiety or depression. Significant interactions for self-compassion, anxiety, and depression with lymphedema status. Appearance investment, age, or time since diagnosis did not moderate outcomes. Mediation analysis reported significant indirect effects for MyCB+UC with BIS and BAS outcomes at one-and three-months when controlling self-compassion at week 1. Overall chi-square analyses demonstrated significance of MyCB+UC at one-week and one-month follow-up.

Note. AAQ-2=Acceptance and Action Questionnaire-2; ADDQoL-19=Audit of Diabetes Dependent Quality of Life-19 questionnaire; AQoL-6= Assessment of Quality of Life–6 Dimension; ASI-R=Appearance Schemas Inventory–Revised; BAS=Body Appreciation Scale; BIS=Body Image Scale; CAACTP=Comprehensive assessment of Acceptance & Commitment Therapy Processes; CESD=Center for Epidemiological Studies Depression; CIRSS=Chronic Illness-related Shame Scale; CFQ-CI=Cognitive Fusion Questionnaire–Chronic Illness; CPAQ-8=Chronic Pain Acceptance Questionnaire-8; CPSS=Chronic Pain Self-Efficacy Scale; DASS=Depression, Anxiety and Stress Scale; DSMQ=Diabetes Self-Management Questionnaire; EISS=External and Internal Shame Scale; FSCRS=Forms of Self-Criticizing & Self-Reassuring Scale; GAD-7= Generalised Anxiety Disorder-7; HADS=Hospital Anxiety and Depression Scale; IIRS=Illness Intrusiveness Rating Scale; LDQ=Leeds Dependence Questionnaire; NRSPI=Numerical Rating Scale of Pain Intensity; OAS=Other as Shamer; PAID=Problem areas in Diabetes questionnaire; PANAS=Positive and Negative Affect Schedule; PANAS-SF=Positive and Negative Affect Schedule-short-form; PCS=Pain Catastrophizing Scale; PHQ-8 Patient Health Questionnaire-8; PHQ-9=Patient Health Questionnaire-9; PRS=Pain Resilience Scale; PSS=Perceived Stress Scale; SWLS=Satisfaction with Life Scale; STAI-T=State-Trait Anxiety Inventory-T scale; SRDS-20=Self-rating depression scale-20; UPPSS-PS=Urgency, Perseverance, Premeditation, Sensation seeking-Positive urgency; WBQ-12=Well-Being Questionnaire-12; WHO-5=World Health Organization Wellbeing Index-5.

Quality Appraisal Outcome

The EPHPP quality appraisal for each study informed the conclusions that were established with respect to the research question (Thomas et al., 2004). Table 5 presents the individual domain and global ratings.

Seven studies had a weak global rating, whilst five studies had a moderate global rating. No studies achieved a strong overall global rating. Four studies that were moderate used a RCT design. Interestingly, two studies received a score of 10 (Kılıç et al., 2023; Ziemer et al., 2017) and two studies received a score of 11 (Hudson et al., 2020; Sherman et al., 2019), however they varied with weak and moderate global ratings. This indicated that whilst the EPHPP tool was useful in providing a global rating for comparison, there were specific domains which may have inflated or reduced the global ratings. Therefore, a summary has been provided below to contextualise how individual domains contributed to the global scores.

All studies apart from Mifsud et al. (2021), had a weak selection bias reflecting the recruitment methods used. The study designs had an impact upon the ratings achieved as studies which were categorised as RCTs (n=9) achieved a strong design rating, whilst remaining cohort analytic and cohort study designs achieved moderate ratings (n=3). Apart from Muftin et al. (2022), studies achieved a strong (n=6) or moderate (n=5) domain rating for confounders. However, only three strong ratings were received in relation to successful blinding of researchers and participants. It was recognised that all studies had a strong data collection strategy which was evidenced by significant and non-significant results that were reported. There was greatest disparity in withdrawals and drop-outs across the studies, and only four studies achieved this strong domain rating. These studies were typically shorter in duration, had a chronic pain (n=2) or breast cancer survivor (n=2) sample, and they had at least a post-intervention measure.

Table 5

Overall and Global EPHPP Ratings

Study	Selection Bias	Study Design	Confounders	Blinding	Data Collection	Withdrawals and Drop-Outs	Global Rating
1	Weak	Strong	Strong	Weak	Strong	Weak	**WEAK – 12**
2	Weak	Strong	Strong	Moderate	Strong	Strong	**MODERATE - 9**
3	Weak	Strong	Strong	Moderate	Strong	Weak	**WEAK - 11**
4	Weak	Moderate	Moderate	Moderate	Strong	Strong	**MODERATE – 11**
5	Moderate	Strong	Moderate	Strong	Strong	Moderate	**MODERATE – 9**
6	Weak	Strong	Moderate	Moderate	Strong	Weak	**WEAK – 12**
7	Weak	Moderate	Strong	Moderate	Strong	Weak	**WEAK – 12**
8	Weak	Strong	Moderate	Moderate	Strong	Strong	**MODERATE - 10**
9	Weak	Strong	Strong	Strong	Strong	Weak	**WEAK – 10**
10	Weak	Moderate	Strong	Moderate	Strong	Weak	**WEAK - 12**
11	Weak	Strong	Weak	Moderate	Strong	Weak	**WEAK – 13**
12	Weak	Strong	Moderate	Strong	Strong	Strong	**MODERATE - 9**

Overview of Digital, Self-Compassion Interventions

Intervention Type

Studies varied in the type of self-compassion intervention offered to participants. Ten studies tailored the intervention to CPHCs, whilst two studies used generic interventions. Studies that achieved an overall moderate quality rating used tailored interventions. Majority of studies utilised online portals (n=8), followed by combined email and audio recording (n=2), websites (n=1), and email links (n=1). Of these, seven interventions utilised reminders.

Most studies used self-compassion writing exercises (n=5; Basque et al., 2021; Mifsud et al., 2021; Sherman et al., 2018; Sherman et al., 2019; Ziemer et al., 2017). Three of these five studies used variations of the same intervention (MyChangedBody). Remaining studies used Compassionate Mind Training (CMT; n=3; Dhokia et al., 2020; Muftin et al., 2022; Wolke, 2022), CFT (n=2; Carvalho et al., 2022; Hudson et al., 2020), or combined self-compassion interventions with other models (n=2; Dowd et al., 2023; Kılıç et al., 2023).

Intervention Duration

The intervention duration ranged between a singular session (Sherman et al., 2018; Sherman et al., 2019) and eight-weeks (Dowd et al., 2023). Interventions typically lasted four-weeks (n=3; Carvalho et al., 2022; Muftin et al., 2022; Wolke, 2022), followed by a three-week duration (n=2; Mifsud et al., 2021; Ziemer et al., 2017). Remaining studies had a duration of two-weeks (Hudson et al., 2020), five-weeks (Kılıç et al., 2023), six-weeks (Basque et al., 2021) and 20 days (Dhokia et al., 2020). Interventions that had multiple sessions varied in the weekly time commitment, ranging between a minimum of eight minutes (n=1) and thirty minutes (n=5). All studies included baseline and post-intervention measures. Seven studies included follow-up measures, ranging between intervals of one-week (Dhokia et al., 2020; Sherman et al., 2018) and six-months (Carvalho et al., 2022; Dowd et al., 2023).

General Intervention Outcomes

Three of six studies comparing self-compassion interventions to an active control demonstrated that there was no difference between interventions. Both CFT and Acceptance and Commitment Therapy (ACT) in non-specific CPHCs were similar in outcomes (Carvalho et al., 2022). There were also no differences between the effectiveness of CMT and mindfulness for individuals with psoriasis (Muftin et al., 2022), and minimal differences between self-compassionate versus self-efficacy writing exercises for those with chronic pain (Ziemer et al., 2017).

In contrast, Dhokia et al. (2020) demonstrated that there were significant differences between 20-day CMT and relaxation music intervention outcomes for chronic pain participants, and Dowd et al. (2022) reported that there were improvements identified at follow-up in the coeliac disease population, when combined self-regulation and self-compassion (SR+SC) was offered (Dowd et al., 2022). Breast cancer survivors also had greater improvements in the self-compassion writing intervention compared to expressive writing, at one-week and one-month follow-up (Sherman et al., 2018).

The use of digital, self-compassion writing exercises indicated improvements, albeit at different timepoints across people with skin conditions (Sherman et al., 2019), chronic pain (Basque et al., 2017) and breast cancer survivors (Mifsud et al., 2021; Sherman et al., 2018). The combination of self-help and audio recordings was deemed to have a small effect for individuals with skin conditions (Hudson et al., 2020). A tailored and combined intervention using ACT and MSC (termed ACSBT-D, for Acceptance, Commitment, and Self-Compassion based treatment in Diabetes) appeared to demonstrate initial improvements for people with T2DM (Kılıç et al., 2023), whilst a general CMT intervention reported psychosocial improvements for a range of CPHCs (Wolke, 2022).

Effectiveness of Digital, Self-Compassion Interventions

Self-Compassion Outcomes

Ten studies measured self-compassion. The most common measure used amongst studies was the Self-Compassion Scale Short-Form (SCS-SF; Raes et al., 2011; n=7), followed by the Self-Compassion Scale (SCS; Neff, 2003; n=3). Mifsud et al. (2022) additionally used the Self-Compassionate Attitude scale (SCA; Przezdziecki & Sherman, 2016). Nine studies demonstrated significant differences on scores of self-compassion measures at post-intervention. Seven studies, including three of a moderate quality, reported that self-compassion improvements were maintained at follow-up.

At the six-month follow-up, SCS scores indicated a significant reduction in uncompassionate responding for both the CFT and ACT interventions (Carvalho et al., 2022). This was similarly reported for those who received the combined SR+SC intervention, where improved self-compassion was identified at six-month follow-up amongst coeliac disease participants (Dowd et al., 2022). The ACSBT-D intervention also demonstrated medium improvements for self-compassion at post-intervention, and large improvements at nine-week follow-up for people with T2DM (Kılıç et al., 2023).

Individuals with skin conditions demonstrated an improved self-compassion score using the SCS-SF, when comparing the intervention and control groups at follow-up (Hudson et al., 2020). This was replicated by Sherman et al. (2019), who had immediate improvements in SCS-SF scores when compared to the active control. Basque et al's. (2017) study of chronic pain participants demonstrated similar improvements in SCS-SF scores at post-intervention. In a breast cancer survivor population, Mifsud et al's. (2021) intervention demonstrated sustained increases in self-compassion at post-intervention and one-month follow-up, and Sherman et al. (2018) reported improvements at one-week and one-month follow-up. In a four-week CMT intervention for a range of CPHCs, there was a significant

increase in compassionate attitudes and decrease in uncompassionate attitudes (Wolke, 2022). However, there was no significant change for SCS-SF scores in Ziemer et al's. (2017) three-week writing intervention.

Psychological Outcomes

All studies used a psychological measure which assessed variables such as: stress, anxiety, depression, wellbeing, positive and negative affect or QOL. Three studies (Dhokia et al., 2021; Muftin et al., 2022; Wolke, 2022) used psychological measures related to compassion such as the Forms of Self-Criticizing & Self-Reassuring Scale (Gilbert, 2004), Other as Shamer (Allan et al., 1994) and External and Internal Shame Scale (Ferreira et al., 2022).

Using a SR+SC intervention, individuals with coeliac disease were observed to have a significant improvement in anxiety and depression at post-intervention (Dowd et al., 2023). This was replicated by Basque et al's. (2017) eight-week self-compassion writing intervention through a significant reduction in anxiety and depression at post-intervention, which was also maintained at follow-up. A self-compassion writing exercise demonstrated a significant change of positive affect in participants with chronic pain, and changes in self-compassion scores predicted significant decreases in depression (Ziemer et al., 2017). However, this varied to Sherman et al's. (2019) self-compassion writing exercise which reported an immediate improvement in negative affect, but not positive affect, in individuals who had visible skin conditions. Breast cancer survivors with lymphedema experienced improved anxiety at one-week follow-up, and improvements in anxiety and depression at one-month follow-up, after a single-session writing intervention (Sherman et al., 2018).

In a T2DM population, the ACSBT-D intervention demonstrated small effects for improved depression and anxiety at post-intervention and follow-up, whilst psychological inflexibility only improved at post-intervention (Kılıç et al's., 2023). In a range of CPHCs,

participants had a significant reduction in self-criticism, depression, stress, and shame, with significant improvements in QOL, wellbeing and self-reassurance (Wolke, 2022). When considering illness-related shame, Carvahlo et al's. (2022) interventions both demonstrated significant reductions at post-intervention which were maintained at study end, in the mixed CPHC population. Similarly, shame and hated-self, was significantly reduced from baseline to post-intervention for individuals with psoriasis (Muftin et al., 2022), and individuals with chronic pain in the CMT group had a reduction in hated-self scores (Dhokia et al., 2020).

Condition-specific Outcomes

Quantitative changes in self-reported outcome measures related to the CPHC were reported by nine studies. These have been summarised below to consider the effectiveness of self-compassion interventions through condition-specific outcomes.

T2DM

Although there was only one study with a T2DM population and it achieved a weak global rating, there were some identified benefits. The combined ACSBT-D intervention demonstrated small effects for improved diabetes wellbeing at post-intervention and follow-up, with a medium improvement of diabetes-related distress at follow-up (Kılıç et al., 2023).

Skin Conditions

Muftin et al. (2022) reported that there was a significant improvement in the Dermatology Life Quality Index (DLQI) scores for individuals with psoriasis from baseline to post-intervention, using a CMT intervention. The same measure was used by Hudson et al. (2020) who demonstrated that there were greater improvements in DLQI scores of visible skin condition participants when comparing the intervention and control group at follow-up, and a medium negative correlation between the increased practice of mindful soothing rhythm breathing exercises with scores on the DLQI. Despite promising improvements, both studies were of a weak quality.

Chronic Pain

Benefits have been considered from the variety of outcomes used to assess pain with respect to the moderate (n=2) and weak (n=1) study qualities. Dhokia et al. (2020) demonstrated that in a chronic pain population who used prescribed analgesic medication, CMT could be effective given the decreased analgesic use and dependence at post-intervention, and the reduction in scores for impulsivity and negative urgency. In addition, a self-compassion writing exercise was able to significantly reduce pain severity and increase life satisfaction (Ziemer et al., 2017). The same intervention demonstrated that changes in self-compassion scores significantly predicted decreased illness intrusiveness and increased activity engagement and pain willingness (Ziemer et al., 2017). Albeit with a weak quality rating, Basque et al. (2021) demonstrated similar findings with a self-compassion writing intervention improving pain, pain resilience, pain acceptance and pain catastrophising at post-intervention. These improvements were maintained at follow-up, with the exception of reported pain increasing (Basque et al., 2021).

Breast Cancer Survivors

The samples of breast cancer survivors were all female, adopted variations of the same writing intervention, and achieved moderate global quality ratings. A tailored self-compassion writing intervention had a significant improvement on body image at follow-up (Mifsud et al., 2021). Whilst there was no significant improvement on body appreciation, this was associated with adherence to the writing exercise. Similarly, combining a self-compassion writing exercise with usual care demonstrated significant improvements on body image at one-month follow-up for all breast cancer survivors, including those with lymphedema and higher appearance investment (Sherman et al., 2018). Though, in this sample, there was a significant improvement of body appreciation at all follow-up timepoints,

and a mediation analysis also revealed that self-compassion scores mediated the improvement in body image and body appreciation scores (Sherman et al., 2018).

Coeliac Disease

Dowd et al's. (2022) combined intervention indicated that there were negative correlations between the Coeliac Dietary Adherence Test (CDAT) with Coeliac Disease Quality of Life (CD-QOL), self-compassion, Self-Regulatory Efficacy (SRE) and Concurrent Self-Regulatory Efficacy (CSRE), positive correlations between CD-QOL with self-compassion and CSRE, and positive correlations between self-compassion and SRE and CSRE. However, these correlational findings must be considered within the weak study quality.

Acceptability of Digital, Self-Compassion Intervention

Attrition and Adherence

Nine studies explicitly reported data on attrition. Whilst recognising the differences in self-compassion interventions and durations, the attrition rates ranged between 0-73.08% (Sherman et al., 2019; Wolke, 2022).

An intervention that offered a single session with immediate follow-up, demonstrated that attrition was minimised (Sherman et al., 2018). However, it was unclear whether sample characteristics, shorter interventions or type of digital intervention contributed to variation of attrition as Dhokia et al's. (2020) 20-day intervention reported minimal attrition rates, whilst Hudson et al's. (2020) two-week intervention had a 50% attrition rate. In a four-week intervention, there was 73.08% attrition (Wolke, 2022), whilst an eight-week intervention reported a 42% drop-out rate (Basque et al., 2021). At six-month follow-up, 50% (Carvalho et al., 2022) and 62.5% attrition rates were reported (Dowd et al., 2022).

Comparatively, seven studies explicitly reported their adherence. For CMT intervention completers, there was a 100% session adherence reported, despite some

participants taking longer to complete the intervention than expected (Wolke, 2022). In two studies that compared interventions, the self-compassion intervention had a slightly reduced adherence rate (Muftin et al., 2022; Ziemer et al., 2017). However, this was inversely reported by Sherman et al. (2018) who found a higher adherence rate (88%) within the self-compassion intervention, when compared to expressive writing (81%). Use of self-compassionate writing interventions varied widely in adherence rates of 23% (Basque et al., 2021), 51% (Mifsud et al., 2021) and 78.1% (Ziemer et al., 2017). A CMT intervention for psoriasis achieved a 67% adherent sample (Muftin et al., 2022), whilst Kılıç et al's. (2023) combined five-week intervention had a 31.58% adherence.

Acceptability Measures

Ten studies reported the acceptability of interventions. It was recognised that acceptability was defined differently across the included studies, with some using measures of attrition as an indicator, others utilising satisfaction questions or calculating the percentage adherence to denote acceptability. The differences observed for acceptability rates could be due to the self-compassion intervention methodology or CPHC.

An online programme utilising self-compassion writing established a high satisfaction from chronic pain participants (93%; Basque et al., 2021). When CFT was compared to ACT in a sample of individuals with multiple CPHCs, there was a 75% acceptability of the four-week intervention duration and a 62.5% acceptability for the individual session duration (Carvalho et al., 2022). Acceptability was reported to be higher when a four-week CMT intervention was used in a sample of multiple CPHCs (90.48%; Wolke, 2022). Whilst Muftin et al. (2022) had a specific population, the comparison of two interventions (CMT vs. mindfulness) demonstrated similar levels of acceptability (60-90%) and Mifsud et al. (2021) reported intervention acceptability to achieve a minimal rate of 67%.

Utility of the single-session intervention was assessed through the significant results that were presented in Sherman et al's. (2019) visible skin condition participants, rather than specific questions on acceptability. Dhokia et al. (2020) and Sherman et al. (2018) reported that high rates of completion and minimal attrition was indicative of the acceptability of CMT and single-session intervention. Dowd et al's. (2023) combined intervention was reported to be "somewhat feasible" for the population based on the attrition and completion rates (p. 217). Although Kılıç et al. (2023) used qualitative methods to assess the acceptability of the ACSBT-D intervention, it was concluded that this could be "poor" given the low retention rate (p. 6).

Summary

The studies included within this systematic review indicate that individuals with CPHCs could benefit from digital, self-compassion interventions. Whilst the findings indicate promising improvements relating to self-compassion, psychological and condition-specific outcomes, and intervention adherence and satisfaction, it is imperative to consider the effectiveness and acceptability with the wider context of the quality ratings that were established and the limited CPHCs that were recruited.

Discussion

This review aimed to assess the effectiveness and acceptability of digital, self-compassion interventions for people with CPHCs. The findings suggest that there were preliminary benefits, however this varied depending on factors such as: the sample of CPHCs, duration of intervention, digital methodology, outcome and satisfaction measures, and the self-compassion intervention.

All studies contributed to the understanding of effectiveness based on self-compassion, psychological or condition-specific outcome measures, although there were less clear conclusions for acceptability of digital, self-compassion interventions within this review. However, promising outcomes were proposed in chronic pain and breast cancer survivor populations, with a trend towards effectiveness and acceptability of digital, self-compassion interventions. Given the heterogeneity of study methodology, characteristics, and quality, this systematic review considers that further exploration would be necessary to reliably and validly suggest the effectiveness and acceptability of digital, self-compassion interventions across CPHCs.

Strengths and Limitations

The systematic review included five heterogenous CPHCs and two mixed CPHC samples, which included 1314 adults. The strengths of this systematic review include the replicated findings of previous reviews indicating that individuals with CPHCs could experience improvements through self-compassion interventions (Austin et al., 2021b; Kılıç et al., 2021), and the emerging evidence for these interventions to be delivered digitally. Furthermore, this systematic review included unpublished literature to minimise publication bias and it utilised PICOS criteria, which both generated literature in an inclusive manner.

The methodological criteria which only included English language studies was a limitation. Additionally, it was acknowledged that included studies did not recruit

populations that were representative of all CPHCs. Whilst this reflects the limited research applying digital, self-compassion interventions across heterogenous CPHCs, there is limited generalisability of findings towards other CPHCs such as T1DM, cystic fibrosis, chronic obstructive pulmonary disease, or epilepsy, to name a few. Establishing whether digital, self-compassion interventions are effective and acceptable for broader CPHCs should be a priority for equitable access. Studies that were included had limited diversity, with most samples including White and female participants. Although literature suggests that females have less self-compassion (Yarnell et al., 2015), this systematic review was unable to assess the impact of digital, self-compassion interventions for males with CPHCs. Previously, it had been suggested that the duration of interventions could affect the outcome of self-compassion (Kılıç et al., 2021). This remains a preliminary outcome to be supported as the current systematic review was limited in the conclusions that could be drawn from the varying durations and interventions, across a heterogenous sample of CPHCs.

A further drawback of this systematic review includes the narrative interpretation of outcome measures, given the heterogeneity of measures and analysis within diverse CPHC samples. Whilst the total scores of the SCS and SCS-SF (Neff, 2003; Raes et al., 2011) can be useful when establishing the effectiveness of an intervention, to understand the mechanisms of interventions, research would be required to analyse the sub-scales (Neff, 2023). Therefore, only tentative suggestions could be made relating to improvements of self-compassion in CPHC populations. However, this could not be hypothesised for interventions that had elements of self-compassion, without a subsequent self-compassion measure (Dhokia et al., 2020; Muftin et al., 2022). As reported in Hughes et al. (2021), this review noticed inconsistences between theoretical interventions and outcome measures as three studies (Carvalho et al., 2022; Hudson et al., 2020; Wolke, 2022) used the SCS or SCS-SF

(Neff, 2003; Raes et al., 2011), despite adopting interventions from Gilbert's (2017b) model of CFT.

Reviewing digital, self-compassion interventions through qualitative interviews or group-based designs was not in the scope of this systematic review. However, these designs could have a position in broadening the understanding of self-compassion interventions for people with CPHCs. Within a qualitative meta-synthesis of self-compassion interventions, participants reported key themes which included CPHC acceptance, emotion-regulation, and social isolation, and these were rarely accounted for in quantitative outcome measures (Austin et al., 2021b). This suggests that a gap exists for qualitative analysis of self-compassion interventions. Perhaps qualitative analysis could explore the demands that newly diagnosed and longstanding CPHC individuals experience when self-managing their condition and engaging in therapeutic approaches, to better understand the effectiveness and acceptability of interventions. Groups have been somewhat successful in CPHC populations (Brown et al., 2022; Moran et al., 2023) and they may offer an understanding for the process of what cultivates self-compassion. Therefore, future research may be necessary to consider whether connection to others with similar experiences is moderating this (Snodgrass et al., 2022).

The context of the Coronavirus pandemic could be considered as a limitation for conclusions that can be drawn from this systematic review. During a time where virtual contact was a substitute for face-to-face connection with healthcare professionals and personal relationships, studies may have experienced recruitment and engagement challenges. However, this could also be an unintentional strength of the systematic review which offers insight into the acceptability of digital interventions when face-to-face psychological support is not an option, which could be the case for individuals depending on socioeconomic circumstances or work commitments, in addition to self-managing a CPHC.

Conducting a quality assessment was a strength of this systematic review, however this process was subject to researcher bias, which should be considered given the adaptation made to EPHPP criteria in this review (Thomas et al., 2004). Whilst the tool was useful at providing a unified risk of bias assessment across all included study designs, it highlighted that there were weaknesses in the selection bias and blinding of studies, which has similarly been observed in compassion intervention literature (Kirby et al., 2017; Maner et al., 2023). Although most studies had strong research designs, it should be recognised that they were mostly feasibility or pilot studies, which was reflected in the selection bias ratings when recruiting participants. While the weak quality ratings could be expected in the context of novel research, stronger quality research will be required to support the evidence-base and generalisability of digital, self-compassion interventions for individuals with CPHCs (Beets et al., 2020) as the current quality appraisals indicate that findings should be interpreted cautiously.

Theoretical Implications

The effectiveness of interventions indicated through this systematic review could be understood through the aforementioned SRRM or SMSR (Baumeister & Heatherton, 1996; Sirois, 2015). Both theories proposed mechanisms by which self-compassion may impact and maintain wellbeing in individuals with CPHCs, though they should be considered alongside underpinnings of respective compassion models. CFT-based interventions emphasise the emotion regulation system (Kirby, 2016), which could suggest that digital interventions activated the soothing system and subsequently improved self-compassion through strategies that targeted CPHC-specific threats, possibly instigating the SRRM or SMSR. Self-compassion can also be viewed as a bipolar construct when considered from an alternative definition (Neff, 2023), which informed some of the interventions in this review. As such,

compassionate responding could instigate the SRRM or SMSR, when uncompassionate responding decreases, after individuals engage in digital, self-compassion interventions.

Research Implications

Similar to meta-analyses of mental health populations (Millard et al., 2023; Wilson et al., 2019), the current systematic review found several studies reporting that self-compassion interventions did not differ from the active control. Further research is required to strengthen the evidence-base for offering a self-compassion intervention to people with CPHCs, and to assess the similarities or differences between psychological interventions given the overlapping literature comparing self-compassion, mindfulness (Muftin et al., 2022; Shapiro & Fitch, 2023) and self-efficacy interventions (Liao et al., 2021; Ziemer et al., 2017). Ongoing research should make use of mediation and moderation analysis, as seen in Sherman et al. (2018), which could help understand the mechanisms and strengths of relationships between self-compassion interventions and respective self-compassion, psychological and condition-specific outcomes (Cha et al., 2022, 2023; Kirby et al., 2017). One proposition is to consider measuring motivation (Cha et al., 2023), as digital, self-compassion interventions could be reliant on individuals who are motivated and ready to access the support. This could also be important to discuss in clinical consultations prior to offering digital interventions (Narasimhan et al., 2023). As research develops, conducting meta-analyses would enable conclusions to be established, such as the digital technology effectiveness or the optimal compassion approach respective to a CPHC. These suggestions should be considered within early stages of research and be transparently recorded within databases which pre-register studies (Kirby, 2016; van den Akker et al., 2023).

There have been changes to the delivery of healthcare following the Coronavirus pandemic. As such, there could be scope to compare digital and face-to-face methods for self-compassion interventions in specific CPHCs. For instance, Kılıç et al's. (2023) ACSBT-D

intervention was deemed to have “poor” acceptability despite the self-reported improvements within the T2DM group, whilst Friis et al’s. (2016) MSC intervention was found to improve mood and objective diabetes health, with no indication of acceptability. Although the two studies used different delivery methods (face-to-face versus digital interventions), they both recruited participants with T2DM, and it remains unclear which self-compassion intervention could be the most effective and acceptable for this population. Furthermore, it would be useful to understand the differences in digital and non-digital mechanisms of self-administered interventions, considering the significant outcomes with digital (Sherman et al., 2018) and paper-based letter writing exercises (Przezdziecki & Sherman, 2016) in breast cancer survivors.

It was suggested that the number of self-compassion interventions that have been developed could be sufficient, and effort should be re-focussed on understanding the mechanisms of change that these interventions contribute to (Mistretta & Davis, 2021). As this systematic review included two untailored interventions, it would be beneficial to understand the extent of generalisable findings, which could inform whether tailored interventions are required. Although this would be reliant on sufficient recruitment, well-powered findings, high-quality RCTs and adequate follow-up time periods (Kirby et al., 2017), limited healthcare funding could mean that a general, rather than specific digital, self-compassion intervention is more plausible to offer to individuals with CPHCs.

Consistent with the suggestion from a systematic review and meta-analysis (Wakelin et al., 2022), further research is required with gender, age, socioeconomic, cultural, and ethnic diversity, which could consequently improve generalisability of digital, self-compassion interventions across diverse populations with CPHCs. In the United Kingdom, there is a disparity in the diagnoses of CPHCs within minority ethnic backgrounds (Raleigh, 2023), such as increased incidence of T2DM in non-White populations (Goff, 2019; Mathur

et al., 2020). A meta-analysis has shown that compassionate interventions are effective in Asian populations (Kariyawasam et al., 2023). Therefore, it is imperative that further research accurately reflects the diversity of those with CPHCs, particularly given the prevalence of shame, self-criticism, and barriers to help-seeking within non-White communities, which could potentially be targeted through digital interventions (Kariyawasam et al., 2023).

Going forward, consideration should be paid to the wider debates between definitions of self-compassion and subsequent measurement within research and clinical services to make an informed choice about appropriate self-compassion measures prior to interventions (Hughes et al., 2021; Muris & Petrocchi, 2017). Matching outcome measures with the approach of compassion, perhaps may be one avenue to pursue. For example, those using CFT or CMT may utilise the Compassionate Engagement and Action Scales (CEAS), which reflects Gilbert's definition of compassion and the therapeutic approach (Gilbert al., 2017; Kariyawasam et al., 2023; Lindsey et al., 2022). Irrespective of the chosen measure, it is imperative to report the sub-scale scores for meaningful interpretations (Wakelin et al., 2022). As literature reports that improving self-compassion reduces self-criticism and shame (Gilbert, 2017b), emphasis should be placed on measuring these related concepts to ensure the validity of self-compassion interventions within CPHC samples. The incorporation of objective measures also remains vital for researchers to consider, particularly in the realm of demonstrating physiological and self-compassion mechanisms within CPHCs (Kirby, 2016; Slivjak et al., 2023).

Clinical Implications

It remains important for the effectiveness and acceptability of therapeutic interventions to be considered by professionals (Kirby, 2016), as individuals with CPHCs may not benefit from effective interventions if they are not deemed to be acceptable. Preliminary evidence has been suggested for the use of digital, self-compassion interventions

in youths (Finlay-Jones et al., 2023b) and adults with CPHCs in this review, yet less is known about the use of such interventions with older adults. In this systematic review, a mixed trend was observed towards acceptability of digital, self-compassion interventions. Therefore, where a range of therapeutic approaches are available in clinical services, there could be an initial discussion to ensure that the preferred therapeutic approach and delivery method is offered to service users, to support the acceptability of therapeutic interventions. Moreover, it is important to consider whether carers and healthcare professionals would also benefit from compassionate interventions which could impact the giving and receiving of compassion, that has been associated with the development of self-compassion (Finlay-Jones et al., 2023a).

CBT is initially delivered via guided self-help to people with CPHCs in IAPT (Improving Access to Psychological Therapies) services (NICE, 2009), but this systematic review suggested that digital, self-compassion interventions could also improve mental wellbeing, alongside self-compassion in some populations. As literature suggests that CPHC populations had modest changes when using computerised CBT (McCombie et al., 2015), and CPHC services begin to implement compassion-focused groups (Brown et al., 2022), perhaps the next step in clinical services would be to implement, offer and evaluate digital, self-compassion interventions.

Within this review, all digital, self-compassion interventions were self-administered with minimal monitoring. Most interventions were tailored to CPHCs, though two were untailored. This proposes an opportunity for CPHC and IAPT services to consider how self-compassion interventions could be offered to service users. For example, services could opt for generalised interventions that would be available for a range of transdiagnostic presentations amongst CPHC populations, or they could offer the developed condition-specific self-compassion interventions. These options could be evaluated in practice through

utilising outcome measures relating to compassion to distinguish the effectiveness and acceptability of the self-help interventions.

Conclusion

This systematic review of 12 studies assessed the effectiveness and acceptability of digital, self-compassion interventions for people with CPHCs. To the best of the authors knowledge, this systematic review was the first to review this question. The findings generate preliminary benefits and contributions to consider for ongoing digital, self-compassion interventions that may support individuals with CPHCs to improve self-compassion, psychological and condition-specific health outcomes.

Registration:

This protocol was registered on https://www.crd.york.ac.uk/prospero/ to prevent replication (Reference: CRD42023426299). Changes to the review were approved, which reflected change in review design, explicitly identifying data that would be extracted, and amending the terminology for the review title.

Conflicts of Interest:

The author had no conflicts of interest for this systematic review.

Sources of Financing:

There were no financial implications for this systematic review.

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Appendix A: PRISMA Checklist and SWiM extension

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HETASHI BAWA

Section B:

An initial evaluation of an online, compassionate intervention for adults with Type 1 and Type 2 Diabetes Mellitus.

Word Count: 7949 (304)/8000

For submission to Internet Interventions.

A thesis submitted in partial fulfilment of the requirements of
Canterbury Christ Church University for the degree of
Doctor of Clinical Psychology

APRIL 2024

SALOMONS INSTITUTE
CANTERBURY CHRIST CHURCH UNIVERSITY

Abstract

Purpose: Following evidence for the beneficial impact of self-compassion, research exploring self-compassion interventions for adults with Chronic Physical Health Conditions has increased. Given the recognition of self-criticism and shame in people with Type 1 and Type 2 Diabetes Mellitus, the current study aimed to evaluate an online, brief, self-help, Compassionate Mind Training intervention for this population.

Methods: A randomised controlled trial was conducted whereby 157 participants completed baseline outcome measures and were randomly allocated to a four-week, self-compassion intervention or waitlist control group. The self-selecting sample were recruited through charities and social media. All participants were invited to complete post-intervention (at four weeks) and follow-up (at eight weeks) outcome measures. These assessed self-reported diabetes-related distress, shame, self-criticism, self-reassurance, wellbeing, and fears of self-compassion. A self-reported physiological measure of glycaemic control was also assessed at follow-up.

Results: At the post-intervention timepoint, the intervention group demonstrated improvements with significantly different change scores of diabetes-related distress and internal shame, compared to the waitlist control group. Diabetes-related distress change scores also significantly differed to the waitlist control group at follow-up. All other self-reported psychological and physiological outcome measures were non-significantly different to the waitlist control group at respective timepoints. Despite the increased levels of attrition in the intervention group, the intervention was reported to be helpful.

Conclusion: Brief, self-help Compassionate Mind Training could be a promising online intervention for people with Type 1 and Type 2 Diabetes Mellitus given the initial changes in diabetes-related distress and internal shame. However, replication is required with a larger sample, alongside improvements being made to the intervention and research methodology.

Keywords: Compassion, Type 1 Diabetes Mellitus, Type 2 Diabetes Mellitus, self-help, diabetes-related distress.

Introduction

Diabetes and Wellbeing

Statistics indicate that there has been an increase in diabetes diagnoses within the United Kingdom (Diabetes UK, 2023a). Among those diagnosed, eight percent of adults live with Type 1 Diabetes Mellitus (T1DM) and ninety percent of adults live with Type 2 Diabetes Mellitus (T2DM), with the remaining two percent consisting of several rarer diabetes conditions (Diabetes UK, 2023a). Prevalence data indicates that males have somewhat higher rates of T1DM (56.4%) and T2DM (55.6%; Public Health Profiles, 2024). Both T1DM and T2DM are known to effect blood glucose, requiring daily self-management and routine input from healthcare professionals for condition monitoring (Carpenter et al., 2019; McCarthy & Grey, 2018). The conditions are differentiated by T1DM being characterised by insulin deficiency (DiMeglio et al., 2018) and T2DM being characterised by insulin resistance (Chatterjee et al., 2017). Yet, both diagnoses can contribute to further physical health conditions (Harding et al., 2019), termed micro-and-macrovascular symptoms, which can impact psychological wellbeing (Chatterjee et al., 2017; Hendrieckx et al., 2020; McCarthy et al., 2015).

Psychological Impact of Diabetes

Diabetes-related Distress

Diabetes-related distress is prevalent and refers to the ongoing emotional distress and demands associated with having a diabetes diagnosis (deMolitor et al., 2020; Fisher et al., 2014). Research highlights that diabetes-related distress impacts the self-management of T1DM and T2DM and the optimal achievement of glycaemic control (Glycated Haemoglobin A1c, referred to as HbA1c), which can contribute to poorer health outcomes (Fisher et al., 2010; Hendrieckx et al., 2020; Todd et al., 2018). Irrespective of having T1DM or T2DM, qualitative analysis has revealed that people with diabetes-related distress similarly

experience misconceptions about self-managing their condition and perceptions of reduced control relating to glucose levels, whilst valuing social support networks (Orben et al., 2022).

Literature has been limited to cross-sectional explanations of how diabetes-related distress develops (Schmitt et al., 2021; Skinner et al., 2020). In a population of individuals with T1DM, an indirect pathway has been proposed to demonstrate that poor emotional regulation, which included reduced self-compassion, mindfulness, and self-empathy, contributed to diabetes-related distress, subsequently impacting poorer condition management and HbA1c (Fisher et al., 2018). Within a T2DM population, increased diabetes-related distress was associated with higher HbA1c levels (Co et al., 2015), which could be influenced by infrequent diabetes self-care activities or medication non-adherence (Asuzu et al., 2017).

Self-Criticism and Shame

Diabetes healthcare professionals are encouraged to remain aware of shame and self-criticism that may emerge in clinical and non-clinical environments (Hendrieckx et al., 2020; Lloyd et al., 2018; NHS England, 2018). Self-criticism can be considered as negative self-evaluation, arising through challenges with diabetes self-management (Friis et al., 2015a; Wakelin et al., 2022). Researchers have demonstrated that self-criticism was associated with diabetes-related distress in T1DM and T2DM populations, via negative judgements of glucose level management, presence of physical symptoms and experiences of maladaptive perfectionism (Hinds, 2023; Kane et al., 2018; Sandham & Deacon, 2023).

Shame, conceptualised as the devalued experience of self, arising from internal and external factors, can contribute to challenges with self-managing diabetes diagnoses (Cooper et al., 2018; Gilbert, 2017; Matos-Pina et al., 2022). Within T1DM and T2DM literature, feelings of shame have been considered to arise through experiences of diabetes stigma (Browne et al., 2013, 2014; Embick et al., 2024; Holmes-Truscott et al., 2020). Although

little is known about the impact of shame across genders, women with T1DM reported experiencing shame based on another's perceptions of the condition (Liu et al., 2017) and women with T2DM experienced shame, which was associated with diabetes-related distress and reduced psychological wellbeing (Inagaki et al., 2022).

Psychological Interventions for Diabetes

Within the National Health Service (NHS), the stepped-care model of psychological support focuses on the improvement of anxiety and depression for people with Chronic Physical Health Conditions (CPHCs; National Collaborating Centre for Mental Health, 2018). In the first instance, self-help interventions are offered within Improving Access to Psychological Therapies (IAPT) services, prior to a psychological intervention such as Cognitive Behavioural Therapy (CBT) with a trained professional (National Collaborating Centre for Mental Health, 2018; Naylor et al., 2016; NICE, 2009; Panchal et al., 2020). However, a recent report recognises that offering broader psychological interventions that consider the connection between physical and psychological wellbeing, or creating links between people with CPHCs for emotional support may be useful (National Voices, 2021). This would be important to explore for the current population given the disparity in embedding psychological professionals within diabetes services (Bateman, 2018).

Self-Help

A systematic review and meta-analysis of digital and non-digital self-help interventions including CBT, bibliotherapy, problem-solving therapy and psychoeducation, indicated preliminary, short-term improvements for diabetes-related distress, depression, anxiety and HbA1c for people with T1DM and T2DM (Wicaksana et al., 2024). When the same populations were offered self-help for fatigue and distress through unguided, app-based support, participants provided positive feedback indicating feasibility of the app content, though effectiveness remains to be established (Muijs et al., 2021). For people with T2DM, a

guided, self-help intervention from an Acceptance and Commitment Therapy (ACT) approach demonstrated improvements in diabetes-related distress and anxiety (NHS Grampian, 2015). These findings suggest that varying psychological approaches and formats of delivering interventions can be considered for people with T1DM and T2DM (Snoek et al., 2024).

CBT and Third-Wave Interventions

In a systematic review of mindfulness-based interventions with T1DM and T2DM populations, improvements of psychological distress, anxiety and depression were observed, whilst variation of intervention types and durations contributed to mixed HbA1c improvements (Noordali et al., 2017). In the same population, a systematic review and meta-analysis of randomised controlled trials (RCTs) indicated that psychological interventions (CBT, mindfulness-based, motivational and problem-solving therapies) improved diabetes-related distress, with decreased HbA1c occurring in tailored diabetes interventions (Schmidt et al., 2018). When comparing the effectiveness of RCTs offered to individuals with diabetes-related distress in a systematic review and meta-analysis, CBT significantly reduced diabetes-related distress and depression, while third-wave CBT interventions (ACT and mindfulness-based) significantly reduced anxiety (Jenkinson et al., 2022). Though, authors recognised methodological and analytical limitations which may have contributed to deviations from the previous trends of improved HbA1c (Jenkinson et al., 2022). Overall, these reviews highlight that effective psychological interventions for individuals with T1DM or T2DM tend to include CBT as per the evidence-base (Naylor et al., 2016; Snoek et al., 2024), or related third-wave CBT therapies, however minimal research considers third-wave compassion approaches.

Self-Compassion Interventions for Diabetes

Cross-sectional research measuring self-compassion in T1DM and T2DM populations has demonstrated associations with improved behavioural, physiological, and psychological outcomes (Ferrari et al., 2017; Ventura et al., 2019). Self-compassion has also moderated the relationship between high HbA1c and high diabetes-related distress (Friis et al., 2015b). Further research in individuals with T2DM indicates that higher levels of self-compassion were associated with reduced depression and diabetes-related distress (Gunn et al., 2022; Morrison et al., 2021). These associations may occur through indirect pathways whereby being self-compassionate contributes to improved diabetes self-care and thus health outcomes, or through direct pathways in the nervous system where self-compassion improves physiological biomarkers of stress (Friis et al., 2015a; Slivjak et al., 2023). The literature connecting self-compassion and diabetes outcomes is promising, though it would benefit from further understanding of intervention modalities that can develop self-compassion in this population (Morgan et al., 2020; Sandham & Deacon, 2023).

CPHC populations have been offered self-compassion interventions with varied therapeutic modalities, delivery formats, and definitions of self-compassion (Austin et al., 2021; Bawa, 2024; Kılıç et al., 2021; Strauss et al., 2016; Wolke, 2022). Typically, self-compassion interventions using Compassion Focused Therapy (CFT) or Compassionate Mind Training (CMT) adhere to Gilbert's (2014) definition of compassion, through the notion of developing a sensitivity and alleviation of suffering for oneself and others, whilst Mindful Self-Compassion (MSC) interventions adopt Neff's (2023) definition of responding, understanding and attending to suffering, conceptualised to occur either in an uncompassionate and compassionate manner.

Certain individual studies that include people with diabetes indicate the psychological and physiological benefits of self-compassion interventions, despite inconclusive meta-

analyses of HbA1c outcomes. An example includes an untailored, face-to-face MSC group intervention, whereby individuals with T1DM and T2DM had significantly maintained improvements of self-compassion, depression and diabetes-related distress at follow-up, with clinical improvements in HbA1c (Friis et al., 2016). Two further studies offering self-compassion strategies were identified for adults with T2DM. A recent online intervention combined ACT and MSC, which was tailored to individuals with T2DM (Kılıç et al., 2023). Notwithstanding challenges with attrition, feasibility and acceptability, outcomes were suggestive of improvements for diabetes-related distress, self-compassion, psychological inflexibility, depression, anxiety and diabetes wellbeing (Kılıç et al., 2023). Additionally, an eight-week group of self-compassion training for adults with T2DM revealed changes in blood glucose at follow-up, despite no measurement of psychological outcomes (Karami et al., 2018). Therefore, preliminary research suggests that self-compassion interventions could be beneficial for this population in a group or online format.

Compassionate Mind Training

CFT is an integrated psychological therapy rooted in a number of different sciences, including evolutionary and attachment theory, social and developmental psychology, and neurophysiology, with an established evidence-base to support individuals experiencing high levels of shame and self-criticism (Gilbert, 2009, 2014; Kirby, 2016). This therapeutic approach shares psychoeducational knowledge about the evolution of emotion regulation systems and the nature of tricky brains, offering a blame-free understanding of responses to difficulties that can be shaped by genes, environments or experiences, which are rarely of our choosing (Gilbert, 2014, 2022a).

Whilst CMT forms part of CFT, it can be offered as a separate intervention (Irons & Heriot-Maitland, 2021; Janes et al., 2024). In CMT, individuals develop an understanding of the three emotion regulation systems (soothe, drive and threat) and cultivate self-compassion

through physiological and psychological exercises such as imagery, writing or breathing techniques, which reduce threat activation and stimulate the soothing system (Gilbert, 2009; Irons & Heriot-Maitland, 2021; Janes et al., 2024). Literature has demonstrated that CMT has improved self-compassion, self-criticism, self-reassurance, shame, fears of compassion and positive emotions, in clinical and non-clinical populations, with varying intervention formats (Irons & Heriot-Maitland, 2021; Matos et al., 2017; Northover et al., 2021; Wolke, 2022). Given the established findings of diabetes-related distress, self-criticism, and shame in people with T1DM and T2DM, CMT could be a useful intervention for this population.

Aims and Hypotheses

The feasibility of an online, brief, self-help CMT intervention has been assessed with the general public (Northover et al., 2021) and wide-ranging CPHCs (Wolke, 2022), which collectively identified changes in self-compassion, self-criticism, depression, wellbeing and shame. The intervention has not yet been offered to a specific CPHC with identified psychological impacts, such as those with T1DM and T2DM. Therefore, the current RCT evaluated the brief, self-help, CMT intervention for people with T1DM and T2DM. In line with the NHS improving lives value, the primary aim assessed whether the online intervention could change diabetes-related distress. Secondary aims included a) assessing whether psychological outcomes of shame, self-criticism, fears of self-compassion, self-reassurance, wellbeing, and self-compassion could change following the intervention, b) whether HbA1c would change at follow-up, c) whether changes in diabetes-related distress and psychological outcomes would be maintained at follow-up. With respect to the intervention group, it was hypothesised that:

1. There would be reduced diabetes-related distress at post-intervention.
2. There would be reduced shame, self-criticism, and fears of self-compassion and increased self-reassurance, wellbeing, and self-compassion at post-intervention.

3. There would be an improved HbA1c at follow-up.
4. The improvement of diabetes-related distress and psychological measures would be maintained at follow-up.

Methods

Design

An experimental, RCT design with a parallel intervention and waitlist control (WLC) group was used for this research project. The project was pre-registered on www.clinicaltrials.gov (NCT05749029; Appendix A). Following the guidance of reporting RCTs, a checklist was completed (Appendix B; Schulz et al., 2010).

Service User Consultation

Service user consultation was sought for the project proposal from the Salomons Advisory Group of Experts by Experience (SAGE). Feedback from SAGE regarding the explanation of research and psychological language was incorporated to ensure accessibility for all potential and participating individuals.

Ethics

The project was approved by the Canterbury Christ Church University ethics committee in November 2022, with a summary of results shared in March 2024 (Appendix C). Participants signed a consent form before being enrolled onto the study (Appendix D). As the project was self-guided, without routine contact from the researcher, support information was provided within the participant information sheet and presented after screening questions if individuals were not eligible to participate (Appendix E). Eligible participants were provided with a random identification number to anonymously match responses at the post-intervention and follow-up timepoints. Participants provided email addresses for automated email reminders respective to each timepoint, for a prize draw incentive for participating and to receive a summary of findings. If participants wished to withdraw, they were able to contact the researcher through the email provided.

Participants

Based on an a priori G*Power calculation (Faul et al., 2007) with a significance value of .05, a power of .80, and a medium effect size of .30, the estimated sample size was projected as 68 participants (34 per group). This was calculated for the primary outcome entering two groups (intervention and WLC) and two intervals of measurement (baseline and post-intervention).

Recruitment was facilitated through social media, charities, and diabetes groups for six months (May–October 2023; Appendix F). The self-selected sample volunteered to participate. Eligibility was assessed through individuals who were residing in the United Kingdom, had clinician diagnosed T1DM or T2DM over a year ago, and were self-managing the condition. Exclusion criteria meant that individuals with gestational diabetes or pre-diabetes were unable to participate. Individuals with current severe mental health conditions, current self-harming or suicidal ideation, and current engagement in psychological therapy were also excluded. Demographic characteristics of eligible participants were collated at baseline through categorical responses (Appendix G).

Primary Measure (Appendix H)

The Diabetes Distress Scale (DDS) has 17-items measuring problems and hassles related to diabetes (Polonsky et al., 2005). Participants rated how much the experiences bothered them in the last month on a Likert scale of one (not a problem) to six (a very serious problem), for example “feeling that I am often failing with my diabetes routine”. Cronbach’s alpha was excellent in the sample (α =.93). The four sub-scales also had acceptable ratings for: emotional burden, relating to the emotional demands of diabetes (α =.82), physician distress, relating to healthcare distress (α= .76), regimen distress, relating to management of diabetes (α =.73) and interpersonal distress, relating to insufficient support from family and

friends (α =.71; Fisher et al., 2019). Total and sub-scale mean scores were interpreted as <2=little to no distress, 2.0-2.9=moderate distress and ≥3=high distress (Fisher et al., 2012).

Secondary Measures (Appendix I-M)

Shame

Shame was measured using the External and Internal Shame Scale (EISS; Ferreira et al., 2022). This is an eight-item scale informed by the evolutionary, biopsychosocial model measuring external (α =.81) and internal (α =.84) dimensions of shame with good Cronbach's alpha's in this sample (Ferreira et al., 2022). Participants responded to the items such as "I am an unworthy person" using a zero (never) to four (always) Likert scale, with higher scores indicating greater internal and external shame. Literature has identified that individuals with CPHCs report higher levels of internal and external shame (Matos-Pina et al., 2022).

Fears of Self-compassion

A 15-item sub-scale within the Fears of Compassion Scale (FCS) was used to measure fears of self-compassion (Gilbert et al., 2011). Participants rated statements such as "I fear that if I am too compassionate towards myself, bad things will happen", on a Likert scale of zero (don't agree at all) to four (completely agree), and the sub-scale had an excellent internal consistency (α =.93). Higher scores indicated greater fears of self-compassion. Within a meta-analysis, this sub-scale has demonstrated associations with shame, self-criticism and psychological wellbeing (Kirby et al., 2019).

Self-Compassion

A 13-item sub-scale within the Compassionate Engagement and Action Scale (CEAS; Gilbert et al., 2017) was used to measure self-compassion. Participants rated statements such as "I do not tolerate being distressed" on a scale of zero (never) to 10 (always), with higher scores indicating greater levels of self-compassion. Reverse-scored items were not analysed. The scale has been validated to measure self-compassion through engagement (α =.74), by

assessing engagement with sensitivity, sympathy, non-judgement, empathy, distress tolerance and caring, and self-compassion through action (α =.90), by balanced reasoning, focusing attention on helpful contexts, actions that alleviate distress and cultivating inner support to alleviate distress (Gilbert et al., 2017; Lindsey et al., 2022).

Self-criticism and Self-reassuring

The Forms of Self-Criticising and Self-Reassuring Scale (FSCRS; Gilbert et al., 2004) has 22-items with statements measuring inadequate self (α =.93), hated self (α =.81) and reassured self (α = .88). Participants rated items on a Likert scale of zero (not at all like me) to four (extremely like me), for example "I am easily disappointed with myself". The scale has established reliability within clinical and non-clinical populations (Baião et al., 2015; Halamová et al., 2018), with higher scores indicating greater self-criticism (inadequate self and hated self) and self-reassurance. The three-factor model has been reported to be suitable for clinical and non-clinical populations (Baião et al., 2015; Castilho et al., 2015).

Wellbeing

Wellbeing was assessed using the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS; Tennant et al., 2007). The 14-item measure has a Likert scale of one (none of the time) to five (all of the time), recording participant responses for statements such as "I've been feeling good about myself" over the last two weeks. The Cronbach's alpha was excellent (α =.93). The scale has an established content validity, with higher scores indicating greater wellbeing (Tennant et al., 2007).

Other Measures

To assess glycaemic control at baseline and at follow-up, participants were asked to self-report a HbA1c level in mmol/mol units taken by a healthcare provider three-to-six months ago (NICE, 2015a, 2015b), as collected in previous research (Ferrari et al., 2017; Ventura et al., 2019). Intervention acceptability was assessed through four items at post-

intervention and three items at follow-up (Table 1; Appendix N), informed by prior research (Matos et al., 2017). Attrition was measured through number and percentage of participants remaining at post-intervention and follow-up.

Table 1

Acceptability Measures

Post-Intervention Questions	**Follow-Up Questions**
Q1. How many of the compassionate interventions did you complete?	Q1. Have you continued to practise self-compassion exercises after completing the intervention?
Q2. Did you manage to complete the compassion intervention within four weeks?	Q2. How often have you continued to practice the self-compassion exercises that you learnt per week?
Q3. How often were you able to practice self-compassion exercises that you learnt per week?	Q3. How helpful were the compassion exercises?
Q4. How helpful were the compassion exercises?	

Intervention

The four-week CMT programme was delivered virtually through the Balanced Minds website which was developed by Dr Chris Irons (Consultant to this project; Appendix O). There was one self-guided session to complete for each of the four weeks, followed by a final summary (Table 2). The content was not tailored to T1DM or T2DM. Instead, content provided generic CMT, which is applicable to a range of difficulties. Individuals watched the 30-minute session, followed by completion of a guided audio self-compassion strategy. Participants were also given instructions to set a compassionate intention for the rest of the week and a short, written summary of the session. Content became available through sequential completion of each section, though there were no restrictions preventing participants from accessing content sooner than one session per week.

Table 2

Intervention Content (adapted from Northover et al., 2021)

Session Number and Title	Session Content and Exercises
1. The foundations of self-compassion	Introduction to self-compassion through the threat, drive and soothe emotion regulation systems (Gilbert, 2009). Audio exercise of soothing rhythm breathing to activate the parasympathetic nervous system known to reduce threat and activate soothing (Matos et al., 2017; Petrocchi et al., 2022).
2. Developing your compassionate self	Understanding and developing qualities of caring, wisdom and strength, associated with improvement of compassionate self (Gilbert, 2009; Matos et al., 2017). Audio exercise of compassionate self imagery, known to reduce shame and activate the soothing system (Maner et al., 2023; Naismith et al., 2019).
3. Deepening the compassionate relationship with yourself	Continuing to develop self-compassion abilities by switching from threat to self-compassion through strategies (Gilbert & Irons, 2004). Audio exercise of compassionate friend imagery, known to reduce shame and activate the soothing system (Maner et al., 2023; Naismith et al., 2019).
4. Self-compassion in everyday life.	Applying self-compassion to everyday life with compassionate letter writing (Gilbert, 2005, 2022b). Audio exercise of moving from threat to compassion.
Summary	End of session summary and resources.

Procedure

Participants were directed to Qualtrics to read the participant information sheet, sign the consent form, and complete eligibility questions. If participants were eligible, they completed the six baseline questionnaires. Following this, individuals were randomly allocated using the Qualtrics Randomiser function, with even chances of being allocated to the intervention or WLC group (Table 3).

The intervention group were immediately given instructions on how to redirect themselves to access the self-compassion intervention on Balanced Minds. Automated weekly emails were sent to those in the intervention group as a reminder to move onto the next session. Emails were automatically sent at post-intervention and follow-up timepoints to complete outcome measures on Qualtrics, with a reminder being sent one-week later. The

WLC group were requested to complete the post-intervention and follow-up measures when the automated emails arrived. Completion of the follow-up questionnaire for participants in the WLC group subsequently provided access to the self-compassion intervention on Balanced Minds.

Due to the intervention being on an external website, it was not possible to analyse whether participants accessed the self-compassion intervention without completing outcome measures or the extent to which the intervention was completed. Therefore, automated reminder emails for outcome measure completion were sent to all participants from Qualtrics. This was irrespective of an incomplete post-intervention measure response or whether the intervention had been accessed by those in the intervention group.

Table 3

Stages of Intervention

<table>
<tr><td>Week 1</td><td colspan="2">Random allocation to Intervention or Waitlist Control Group.
Completion of Time 0 outcome measures (baseline).</td></tr>
<tr><td rowspan="3">Week 2
Week 3
Week 4</td><td>Intervention Group
Completing four-week intervention with weekly reminder emails.</td><td>Waitlist Control Group
No input.</td></tr>
<tr><td>Intervention Group
Emailed to complete Time 1 outcome measures (post-intervention) with reminder one-week later.</td><td>Waitlist Control Group
Emailed to complete Time 1 outcome measures (post-intervention) with reminder one-week later.</td></tr>
<tr><td>Week 5-8</td><td colspan="2">Intervention and Waitlist Control Group
No input.</td></tr>
<tr><td>Week 8</td><td>Intervention Group
Emailed to complete Time 2 outcome measures (follow-up) with reminder one-week later.</td><td>Waitlist Control Group
Emailed to complete Time 2 outcome measures (follow-up) with reminder one-week later. Completion provided access to intervention.</td></tr>
<tr><td colspan="3">End of Study</td></tr>
</table>

Analysis

Participant data was exported from Qualtrics to IBM SPSS Statistics (Version 29). There were no missing responses of demographics or outcome measures as Qualtrics questions were designed with forced responses. Frequencies and chi-square tests were conducted for categorical demographic variables to establish baseline differences between the intervention and WLC group.

Normal distribution was assessed for all outcome measures across timepoints by group (intervention vs. WLC), assessing skewness, kurtosis, and Shapiro-Wilk significance levels. Outliers were visually inspected through boxplots and remained based on meaningful data variation across participants. Violations of normality occurred in some outcome measures (Appendix P). Therefore, to avoid type one error, non-parametric tests were used for all analyses (Nahm, 2016).

An intention-to-treat approach was used to report descriptive statistics (mean, standard deviation, median and interquartile range) for outcome measures at each timepoint, irrespective of post-intervention or follow-up questionnaire completion. To assess baseline differences of outcome measures and randomisation success between the intervention and WLC group, Mann-Whitney U tests were conducted. The intention-to-treat approach was used to also report HbA1c levels at baseline and follow-up. Participants who provided a HbA1c level beyond the specified timepoint at baseline (n=31) and follow-up (n=13) or indicated that they were unaware of HbA1c levels at baseline (n=38) and follow-up (n=14), were excluded.

The primary outcome at the pre-registration stage was change in total DDS score between baseline and post-intervention. Change scores were calculated by subtracting baseline scores from post-intervention scores, therefore primary analysis was based on complete cases. A Mann-Whitney U test explored whether change was significantly different

between the intervention and WLC group. Where a significant difference was established, Wilcoxon-Signed Ranks tests were conducted to analyse whether the difference occurred within the intervention or WLC group. Effect sizes were calculated by $r = \frac{z}{\sqrt{n}}$ and interpreted using Cohen's (1988) criteria of small (*r* =.10), medium (*r* =.30) and large effects (*r* =.50) (Pallant, 2020). For Mann-Whitney U tests, *n* was equal to the number of cases and in the Wilcoxon-Signed Rank test, *n* was equal to the number of observations (Pallant, 2020). There is debate in the literature regarding adjusting for multiple comparisons (Althouse, 2016; Feise, 2002). Bonferroni corrections were not applied to this analysis given the a priori identification of the primary outcome and increased possibility of type two error occurring (Streiner, 2015; Streiner & Norman, 2011). To further explore the changes in total DDS at post-intervention, between-group comparisons were conducted for the four sub-scales using Mann-Whitney U tests. Given that the sub-scales were not identified as the primary outcome, these comparisons were reported with and without Bonferroni corrections (*p*=.05/4=.0125).

Change in total DDS between baseline and follow-up was a secondary outcome. This was calculated by subtracting baseline scores from follow-up scores. Therefore, complete case analysis included the aforementioned Mann-Whitney U test for between-group differences, and Wilcoxon-Signed Rank tests for within-group differences. Results were reported with and without Bonferroni corrections to account for prior between-group DDS analysis (*p*=.05/2=.025) and the within-group comparison (*p*=.05/2=.025). Between-group comparisons were also explored for the four sub-scales at follow-up and reported with and without Bonferroni corrections (*p*=.05/4=.0125).

All other secondary outcome measures were analysed for change at post-intervention and follow-up, by subtracting baseline scores from respective timepoints, resulting in complete case analysis. Results were reported indicating significance values with and without Bonferroni corrections given the multiple comparisons that were completed at each timepoint

(p=.05/9=.0056). Significant between-group differences established from Mann-Whitney U tests that withstood Bonferroni corrections were explored using Wilcoxon-Signed Ranks tests to establish whether differences were within the intervention or WLC group. Within-group differences were also presented with and without Bonferroni corrections (p=.05/2=.025).

Change in HbA1c was only analysed at follow-up, as per pre-registration. Only complete data (n=28) was included when analysing between-group change in HbA1c (subtracting baseline from follow-up) using a Mann-Whitney U test.

Given that attrition contributed to missing data at post-intervention and follow-up timepoints, multiple imputation was not recommended for primary and secondary analysis (Jakobsen et al., 2017). Instead, completers at time one (all participants who completed post-intervention measures) and completers at time two (all participants who completed follow-up measures) were compared to non-completers using Chi-Square tests for demographic differences and Mann-Whitney U tests for baseline outcome measures. Post-intervention study non-completers in the intervention and WLC group were also compared using the same analyses. These findings are presented after the main analyses to consider biases that may have impacted attrition and non-completion between groups.

Post-hoc exploratory Spearman's rank correlation was conducted to assess associations of baseline outcome measures and self-compassion practice at post-intervention, enabling comparison to prior research (Wolke, 2022).

Results

Participants

A total of 157 participants were randomised and allocated to the intervention or WLC group. The flow-diagram (Figure 1) indicates the number of participants per group who completed outcome measures at the post-intervention and follow-up timepoints. Four participants withdrew from the intervention group before the post-intervention timepoint.

Demographics

Demographic comparisons of randomised participants are summarised in Table 4 for the intervention and WLC group. The groups were not significantly different in demographic characteristics, apart from diabetes type, which revealed that the intervention group had a larger proportion of individuals with T2DM (p = .030). Both groups consisted of more participants who had lived with diabetes for more than 21 years, who were taking insulin, with similar age ranges between groups. There was a greater proportion of females in both groups and participants were predominately from a White background. Both groups had similar proportions of individuals who had other medical conditions. More participants in the control group identified as having a disability, though this was not significantly different. Median HbA1c at baseline was 53 mmol/mol (n=46) for the intervention group and 54.50 mmol/mol (n=42) for the WLC group, with no significant baseline differences (U =957.50, z =-0.071, p =.943, r =.007).

Baseline Comparisons

There were no significant baseline differences between the intervention and WLC group for diabetes-related distress, shame, self-criticism, self-reassurance, self-compassion, fears of self-compassion or wellbeing (p >.05; Table 5), indicating that randomisation was effective. Both groups indicated high distress for total DDS and three sub-scales (emotional burden, physician distress and interpersonal distress).

Figure 1

CONSORT flow-diagram (Eldridge et al., 2016)

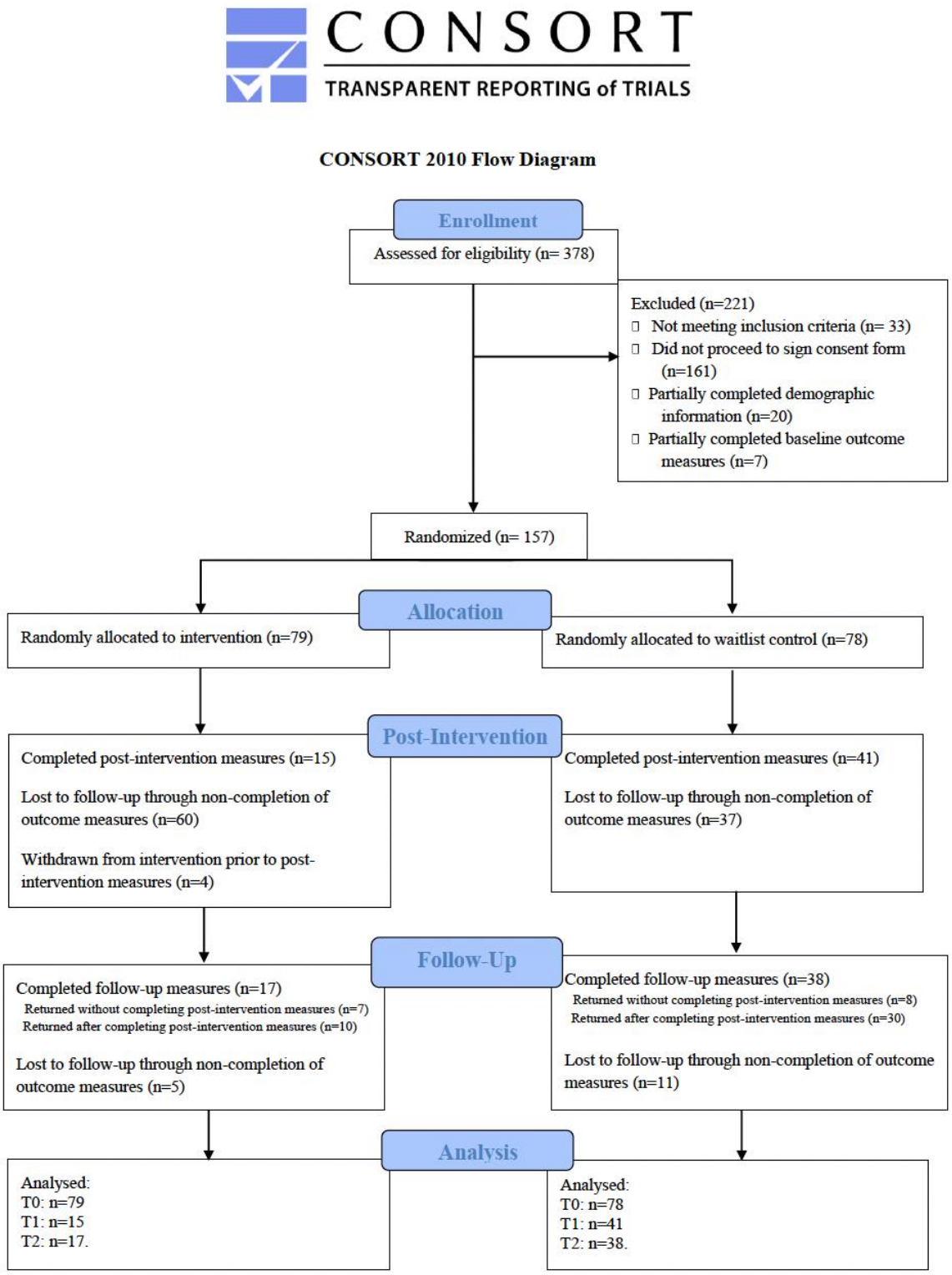


Table 4

Demographic Frequencies

	Intervention (N=79)	Waitlist Control Group (N=78)	Between-Group Comparison
Diabetes Type			$\chi^2 = 4.691$, $p = .030$*
Type 1	58	68	
Type 2	21	10	
Diabetes Duration			$\chi^2 = 1.227$, $p = .874$
1-5 years	14	19	
6-10 years	8	6	
11-15 years	8	7	
16-20 years	11	11	
21+ years	38	35	
Age			$\chi^2 = 1.395$, $p = .925$
18-24	4	6	
25-34	20	19	
35-44	19	19	
45-54	16	18	
55-64	13	12	
65+	7	4	
Gender			$\chi^2 = 3.034$, $p = .552$
Female	62	61	
Male	16	15	
Non-Binary	0	1	
Transgender	1	0	
Other	0	1	
Ethnicity			$\chi^2 = 6.059$, $p = .195$
White	71	68	
Asian/Asian British	4	4	
Black/Black	2	2	
British/Caribbean/African			
Mixed or multiple ethnic groups	0	4	
Other	2	0	
Disability Status			$\chi^2 = 1.840$, $p = .175$
Yes	35	43	
No	44	35	
Diabetes Medication			$\chi^2 = 1.582$, $p = .453$
Insulin	66	70	
Tablets	11	6	
Not taking medication	2	2	
Other Medical Conditions			$\chi^2 = 0.318$, $p = .573$
Yes	40	43	
No	39	35	

*p <.05

Table 5

Descriptive Statistics of Primary and Secondary Outcome Measures (Intention-to-Treat Analysis)

	Baseline (Time 0)				Post-Intervention (Time 1)				Follow-Up (Time 2)				
	Intervention (N=79)		Waitlist Control (N=78)		Intervention (N=15)		Waitlist Control (N=41)		Intervention (N=17)		Waitlist Control (N=38)		
	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	Between-Group Comparison at Baseline (Time 0)
DDS Total	3.16 (1.03)	3.18 (1.59)	3.20 (1.05)	3.21 (1.60)	2.66 (1.18)	2.29 (1.94)	3.17 (1.21)	3.06 (1.97)	2.44 (1.04)	2.18 (2.03)	3.12 (1.25)	3.21 (2.06)	U = 3032.00, z = -0.172, p = .863
Emotional Burden	3.08 (1.16)	3.00 (1.80)	3.24 (1.18)	3.40 (1.65)	2.77 (1.42)	2.20 (2.20)	3.21 (1.24)	3.20 (1.90)	2.36 (1.08)	2.00 (2.20)	3.23 (1.32)	3.30 (2.20)	U = 2824.00, z = -0.904, p = .366
Physician Distress	3.34 (1.20)	3.25 (2.00)	3.27 (1.17)	3.35 (1.75)	2.90 (1.31)	2.50 (2.50)	3.31 (1.33)	3.25 (2.00)	2.57 (1.18)	2.00 (1.88)	3.22 (1.37)	3.38 (2.38)	U = 2994.50, z = -0.304, p = .761
Regimen Distress	2.90 (1.04)	2.80 (1.40)	2.93 (1.09)	3.00 (1.60)	2.19 (1.05)	1.80 (1.20)	2.96 (1.17)	2.80 (1.90)	2.27 (0.85)	2.00 (1.00)	2.88 (1.28)	2.70 (2.05)	U = 3019.50, z = -0.216, p = .829
Interpersonal Distress	3.51 (1.27)	3.33 (1.67)	3.47 (1.21)	3.50 (2.08)	2.93 (1.53)	2.33 (2.67)	3.29 (1.44)	3.67 (2.33)	2.65 (1.40)	2.00 (2.50)	3.19 (1.34)	3.33 (2.00)	U = 2921.00, z = -0.352, p = .725
EISS													
External Shame	7.84 (3.30)	8.00 (4.00)	7.78 (3.49)	8.00 (4.00)	6.33 (3.43)	7.00 (6.00)	7.63 (3.54)	8.00 (5.00)	6.06 (2.99)	8.00 (4.50)	7.79 (3.81)	8.00 (4.50)	U = 3018.00, z = -0.222, p = .824
Internal Shame	8.43 (3.88)	9.00 (5.00)	8.18 (3.91)	9.00 (6.00)	6.20 (4.09)	7.00 (6.00)	7.87 (4.18)	8.00 (8.00)	6.76 (3.98)	6.00 (5.50)	7.74 (4.04)	8.00 (5.00)	U = 2969.50, z = -0.393, p = .695
Fear of Self-Compassion	22.63 (14.11)	22.00 (18.00)	24.69 (13.83)	25.00 (21.50)	15.27 (14.81)	9.00 (27.00)	23.05 (15.51)	21.00 (23.50)	10.88 (10.29)	7.00 (17.50)	23.31 (15.94)	25.50 (29.75)	U = 2767.00, z = -1.103, p = .270
CEAS													
Engagement	31.96 (9.73)	31.00 (12.00)	31.83 (8.87)	32.50 (14.25)	35.00 (9.96)	36.00 (12.00)	34.68 (9.20)	36.00 (11.50)	36.82 (7.60)	36.00 (9.00)	33.95 (9.51)	33.50 (13.75)	U = 3036.50, z = -0.156, p = .876
Action	20.68 (8.38)	20.00 (13.00)	20.00 (8.06)	19.50 (11.25)	24.60 (7.50)	24.00 (12.00)	22.24 (8.50)	23.00 (14.50)	24.59 (8.46)	24.00 (12.00)	22.13 (8.57)	20.50 (13.25)	U = 2957.50, z = -0.434, p = .664
FSCRS													
Hated Self	6.52 (5.14)	6.00 (8.00)	7.00 (4.89)	6.50 (7.25)	4.33 (5.10)	2.00 (4.00)	6.90 (5.19)	7.00 (9.00)	4.06 (4.22)	3.00 (7.50)	7.00 (5.33)	7.50 (9.25)	U = 2884.00, z = -0.692, p = .489
Reassured Self	14.51 (6.82)	14.00 (8.00)	14.09 (5.89)	14.00 (8.00)	16.67 (6.77)	15.00 (8.00)	15.73 (7.62)	15.00 (7.50)	18.65 (6.89)	17.00 (11.50)	15.58 (7.33)	14.00 (8.25)	U = 3042.00, z = -0.135, p = .892
Inadequate Self	23.47 (9.40)	27.00 (14.00)	23.78 (8.84)	26.00 (15.00)	18.80 (8.91)	22.00 (18.00)	21.95 (9.13)	24.00 (15.00)	15.82 (9.05)	17.00 (14.00)	21.76 (9.94)	24.00 (17.25)	U = 3044.00, z = -0.128, p = .898
WEMWBS	40.59 (10.83)	40.00 (16.00)	41.53 (8.88)	40.00 (12.50)	47.33 (9.66)	48.00 (11.00)	41.17 (9.12)	42.00 (13.00)	48.88 (8.70)	48.00 (13.50)	41.81 (9.89)	40.50 (17.00)	U = 2837.50, z = -0.855, p = .392

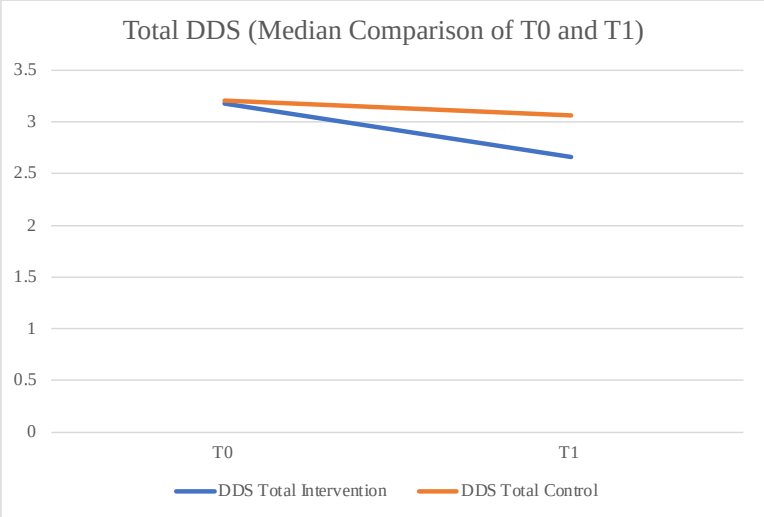
Note. DDS=Diabetes Distress Scale; EISS=External and Internal Shame Scale; CEAS=Compassionate Engagement and Action Scale; FSCRS=Forms of Self-Criticising and Self-Reassuring Scale; WEMWBS=Warwick-Edinburgh Mental Wellbeing Scale.

Primary Outcome

Between-group comparison of the intervention and WLC group revealed a small, significant difference for change in total DDS scores between the post-intervention and baseline timepoint (U =191.50, z =-2.148, p =.032, r =-.29). As hypothesised and shown in Table 5, this emerged through a significant improvement, denoted by decreased total DDS median scores, within the intervention group at post-intervention (Z =-2.170, p =.030, r =-.40), whilst there was a non-significant difference in scores within the WLC group (Z =-0.049, p =.961, r =-.005; Figure 2).

Figure 2

Comparison of Total DDS Medians at Post-Intervention



To further understand the between-group difference, the DDS sub-scale scores were analysed for change between the post-intervention and baseline timepoint (Table 6). Analyses revealed medium, significant differences of physician distress and regimen distress scores, with median scores decreasing at post-intervention, though these did not remain significant after a Bonferroni adjustment. Interpersonal distress and emotional burden change scores were not significantly different to the WLC group.

Table 6

Between-Group Comparison of Change Scores (Post-Intervention minus Baseline) in DDS Sub-Scales

Outcome Measure (N=56)	Between-Group Comparison	Effect Size
Emotional Burden	U = 262.50, z = -0.836, p = .403	r = -.11
Physician Distress	U = 189.00, z = -2.208, p = .027*	r = -.30
Regimen Distress	U = 134.50, z = -3.225, p = .027*	r = -.43
Interpersonal Distress	U = 247.50, z = -1.125, p = .261	r = -.15

*p <.05.

Secondary Outcomes

Post-Intervention

Contrary to hypotheses, most secondary outcome measure change scores were not significantly different between the post-intervention and baseline timepoint when between-group comparisons were conducted for the intervention and WLC group (Table 7). This suggested that there were non-significant differences for self-criticism, self-reassurance, fears of self-compassion, self-compassion relating to action, and external shame between the two groups.

Whilst significant between-group differences in change scores were established for internal shame, self-compassion relating to engagement and wellbeing, which could be understood by the improved median scores seen in Table 5, only internal shame scores retained a significant, between-group difference after a Bonferroni correction for multiple comparisons. Within-group comparisons of internal shame scores revealed significantly reduced median scores at post-intervention for the intervention group (Z =-3.019, p =.003, r =.50), but not the WLC group (Z =-0.982, p =.326, r =.10; Figure 3). The change in internal shame scores remained significantly different in the intervention group after a Bonferroni adjustment for multiple comparisons (p <.025).

Table 7

Between-Group Comparison of Change Scores (Post-Intervention minus Baseline) in Secondary Outcomes

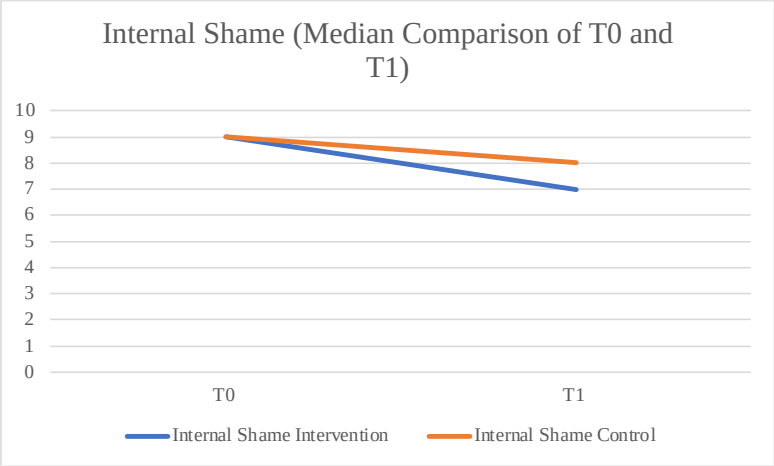
	Baseline and Post-Intervention (N=56)	
Outcome Measure	Between-Group Comparison	Effect Size
EISS		
External Shame	U = 221.00, z = -1.62, p = .105	r = -.22
Internal Shame	U = 156.50, z = -2.823, p = .005**	r = -.37
Fear of Self-Compassion	U = 217.50, z = -1.667, p = .096	r = -.22
CEAS		
Engagement	U = 180.50, z = -2.355, p = .019*	r = -.31
Action	U = 221.50, z = -1.597, p = .110	r = -.21
FSCRS		
Hated Self	U = 242.50, z = -1.214, p = .225	r = -.16
Reassured Self	U = 280.00, z = -0.511, p = .610	r = -.07
Inadequate Self	U = 306.00, z = -0.028, p = .978	r = -.004
WEMWBS	U = 179.00, z = -2.382, p = .017*	r = -.32

Note. EISS=External and Internal Shame Scale; CEAS=Compassionate Engagement and Action Scale; FSCRS=Forms of Self-Criticising and Self-Reassuring Scale; WEMWBS=Warwick-Edinburgh Mental Wellbeing Scale.

*p <.05. **p <.0056 (Bonferroni correction).

Figure 3

Comparison of Internal Shame Medians

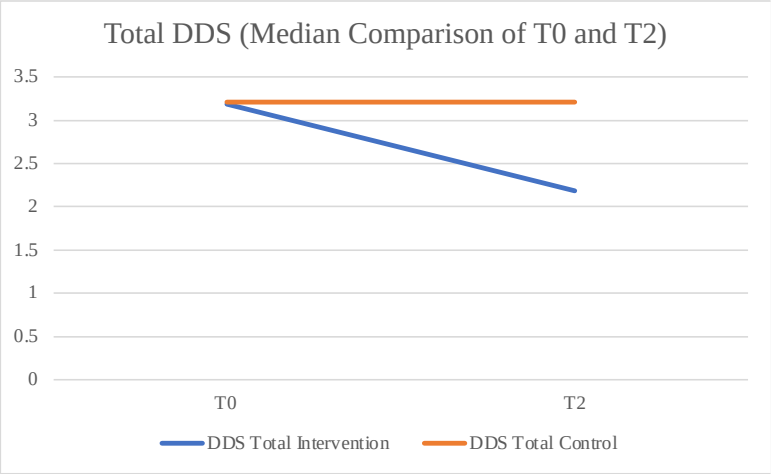


Follow-Up

Change in total DDS scores between the follow-up and baseline timepoint significantly differed in the between-group comparison of the intervention and WLC group, with a medium effect size (U =197.50, z =2.288, p =.022, r =-.31). This withstood a Bonferroni adjustment (p <.025). As hypothesised, the decreased median scores, which suggest an improvement in total DDS, were significantly different for the intervention group (Z =-2.606, p =.009, r =-.45), but not the WLC group (Z =-0.611, p =.541, r =-.07; Figure 4). This improvement remained significant with a Bonferroni adjustment for multiple comparisons (p <.025).

Figure 4

Comparison of Total DDS Medians at Follow-Up



As explored for the primary outcome, sub-scales were analysed to understand the between-group change in DDS score (Table 8). Whilst regimen distress change scores decreased, and significantly differed between-groups from follow-up and baseline, this did not remain significant when a Bonferroni correction was applied. Interpersonal distress, emotional burden, and physician distress change scores were not significantly different between the intervention and WLC group.

Table 8

Between-Group Comparison of Change Scores (Follow-Up minus Baseline) in DDS Sub-scales

	Baseline and Follow-Up (N=55)	
Outcome Measure	Between-Group comparison	Effect Size
Emotional Burden	U = 217.50, z = -1.932, p = .053	r = -.26
Physician Distress	U = 235.50, z = -1.602, p = .109	r = -.22
Regimen Distress	U = 194.50, z = -2.354, p = .019*	r = -.32
Interpersonal Distress	U = 249.00, z = -1.378, p = .168	r = -.18

*p <.05.

Between-group comparison of the intervention and WLC group revealed that several secondary outcomes were not significantly different in change scores between the follow-up and baseline timepoint, which was contradictory to hypotheses (Table 9). Fears of self-compassion and wellbeing median scores were significantly different in the between-group comparisons, indicating improvement with small to medium effect sizes, though these did not remain significant with a Bonferroni correction for multiple comparisons.

Between-group comparison of change in HbA1c levels (n=28) revealed no significant differences between follow-up and baseline measurements when the intervention and WLC group were compared (U =81.50, z =-0.418, p =.676, r =-.08; Table 10).

Table 9

Between-Group Comparison of Change Scores (Follow-Up minus Baseline) in Secondary Outcomes

	Baseline and Follow-Up (N=55)	
Outcome Measure	Between-Group comparison	Effect Size
EISS		
External Shame	U = 228.50, z = -1.738, p = .082	r = -.23
Internal Shame	U = 314.00, z = -0.166, p = .868	r = -.02
Fear of Self-Compassion	U = 190.00, z = -2.424, p = .015*	r = -.33
CEAS		
Engagement	U = 231.50, z = -1.669, p = .095	r = -.23
Action	U = 287.00, z = -0.659, p = .510	r = -.09
FSCRS		
Hated Self	U = 295.00, z = -0.521, p = .603	r = -.07
Reassured Self	U = 319.50, z = -0.064, p = .949	r = -.008
Inadequate Self	U = 279.00, z = -0.804, p = .421	r = -.11
WEMWBS	U = 209.00, z = -2.08, p = .037*	r = -.28

Note. EISS=External and Internal Shame Scale; CEAS=Compassionate Engagement and Action Scale; FSCRS=Forms of Self-Criticising and Self-Reassuring Scale; WEMWBS=Warwick-Edinburgh Mental Wellbeing Scale.

*p <.05.

Table 10

HbA1c Levels (Intention-to-Treat Analysis)

	Baseline				Follow-Up			
	Intervention (N=46)		Waitlist Control (N=42)		Intervention (N=10)		Waitlist Control (N=18)	
	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)
HbA1c	59.57 (22.42)	53.00 (30.00)	55.60 (12.39)	54.50 (15.00)	57.10 (19.52)	52.50 (15.25)	51.61 (12.34)	51.00 (14.00)

Attrition

The intervention group had a small withdrawal rate (5%) and a high post-intervention attrition rate (76%), compared to the WLC group (47.4%). At follow-up, the intervention group retained a greater attrition rate (78%) than the WLC group (51.2%). As there were higher rates of attrition within the intervention group, study non-completers at post-intervention were analysed for between-group differences in demographics and baseline outcome measures (Tables 11-13; Appendix Q includes descriptive statistics). There were no significant differences between study non-completers, suggesting no biases for attrition from measured demographics or variables between the groups. Completers at post-intervention and completers at follow-up were also compared to non-completers (Tables 11-13; Appendix Q). There were no significant differences between completers and non-completers at either timepoint for demographics or baseline outcome measures.

Table 11

Demographic Comparison for Completers vs. Non-Completers and Study Non-Completers

	Time 1 Completers vs. Non-Completers[a]			**Time 2 Completers vs. Non-Completers[a]**			**Intervention vs. Waitlist Control Study Non-Completers at Post-Intervention**		
	Completers (N=56)	Non-Completers (N=101)	Between-Group Comparison	Completers (N=55)	Non-Completers (N=102)	Between-Group Comparison	Intervention Non-Completers (N=64)	Waitlist Control Non-Completers (N=37)	Between-Group Comparison
Diabetes Type		$\chi^2 = 0.001$, $p = .981$			$\chi^2 = 0.230$, $p = .632$			$\chi^2 = 2.972$, $p = .085$	
Type 1	45	81		43	83		48	33	
Type 2	11	20		12	19		16	4	
Diabetes Duration		$\chi^2 = 5.685$, $p = .224$			$\chi^2 = 5.737$, $p = .220$			$\chi^2 = 0.698$, $p = .952$	
1-5 years	15	18		11	22		12	6	
6-10 years	6	8		4	10		6	2	
11-15 years	2	13		3	12		8	5	
16-20 years	6	16		5	17		10	6	
21+ years	27	46		32	41		28	18	
Age		$\chi^2 = 4.353$, $p = .500$			$\chi^2 = 7.185$, $p = .207$			$\chi^2 = 8.404$, $p = .135$	
18-24	3	7		2	8		3	4	
25-34	12	27		9	30		18	9	
35-44	12	26		14	24		14	12	
45-54	11	23		12	22		13	10	
55-64	13	12		13	12		10	2	
65+	5	6		5	6		6	0	
Gender		$\chi^2 = 5.629$, $p = .299$			$\chi^2 = 2.309$, $p = .679$			$\chi^2 = 5.957$, $p = .202$	
Female	40	83		42	81		51	32	
Male	16	15		13	18		12	3	
Non-Binary	0	1		0	1		0	1	
Transgender	0	1		0	1		1	0	
Other	0	1		0	1		0	1	
Ethnicity		$\chi^2 = 3.164$, $p = .531$			$\chi^2 = 6.040$, $p = .196$			$\chi^2 = 2.939$, $p = .568$	
White	48	91		47	92		57	34	
Asian/Asian British	3	5		4	4		4	1	

Black/Black British/Caribbean/African	1	3	0	4	2	1
Mixed or multiple ethnic groups	3	1	3	1	0	1
Other	1	1	1	1	1	0
Disability Status		$\chi^2 = 0.075$, $p = .784$		$\chi^2 = 0.314$, $p = .575$		$\chi^2 = 1.877$, $p = .171$
Yes	27	51	29	49	29	22
No	29	50	26	53	35	15
Diabetes Medication		$\chi^2 = 0.367$, $p = .832$		$\chi^2 = 0.763$, $p = .683$		$\chi^2 = 0.598$, $p =. 742$
Insulin	48	88	46	90	55	33
Tablets	6	11	7	10	8	3
Not taking medication	2	2	2	2	1	1
Other Medical Conditions		$\chi^2 = 0.287$, $p = .592$		$\chi^2 = 2.723$, $p = .099$		$\chi^2 = 0.590$, $p =. 443$
Yes	28	55	34	49	33	22
No	28	46	21	53	31	15

[a] Analysis collapsed between groups to include intervention and waitlist control group participants.

Table 12

HbA1c Comparison for Completers vs. Non-Completers and Study Non-Completers

	Time 1 Completers vs. Non-Completers[a]	**Time 2 Completers vs. Non-Completers[a]**	**Intervention vs. Waitlist Control Study Non-Completers at Post-Intervention**
	Between-Group Comparison of Completers (N=29) and Non-Completers (N=59)	Between-Group Comparison of Completers (N=34) and Non-Completers (N=54)	Between-Group Comparison of Intervention (N=39) and Waitlist Control (N=20)
HbA1c	$U = 716.00$, $z = -1.240$, $p = .215$	$U = 873.00$, $z = -0.368$, $p =.700$	$U = 350.00$, $z = -0.641$, $p = .521$

[a] Analysis collapsed between groups to include intervention and waitlist control group participants.

Table 13

Baseline Outcome Measure Comparison for Completers vs. Non-Completers and Study Non-Completers

	Time 1 Completers vs. Non-Completers[a]	**Time 2 Completers vs. Non-Completers[a]**	**Intervention vs. Waitlist Control Study Non-Completers at Post-Intervention**
	Between-group comparison of Completer (N=56) vs. Non-Completers (N=101)	Between-group comparison of Completer (N=55) and Non-Completers (N=102)	Between-group comparison of Intervention (N=64) vs. Waitlist Control (N=37)
DDS	*U* = 2766.00, *z* = -0.227, *p* = .820	*U* = 2543.50, *z* = -0.962, *p* = .336	*U* = 1146.00, *z* = -0.268, *p* = .789
Emotional Burden	*U* = 2798.50, *z* = -0.108, *p* = .914	*U* = 2775.50, *z* = -0.109, *p* = .913	*U* = 1090.50, *z* = -0.660, *p* = .509
Physician Distress	*U* = 2796.00, *z* = -0.118, *p* = .906	*U* = 2579.50, *z* = -0.832, *p* = .406	*U* = 1154.50, *z* = -0.209, *p* = .835
Regimen Distress	*U* = 2814.50, *z* = -0.050, *p* = .960	*U*= 2499.50, *z* = -1.126, *p* = .260	*U* = 1154.50, *z* = -0.209, *p* = .835
Interpersonal Distress	*U* = 2851.00, *z* = -0.908, *p* = .364	*U*= 2368.50, *z* = -1.612, *p* = .107	*U* = 1164.50, *z*= - 0.138, *p* = .890
EISS			
External Shame	*U* = 2797.00, *z* = -0.114, *p* = .909	*U* = 2757.50, *z* = -0.176, *p* = .861	*U* = 1130.50, *z* = -0.380, *p* = .704
Internal Shame	*U* = 2722.00, *z* = -0.390, *p* = .697	*U* = 2779.50, *z*= -0.094, *p* = .925	*U* = 1128.00, *z* = -0.396, *p* = .692
Fear of Self-Compassion	*U* = 2815.50, *z* = -0.046, *p* = .963	*U* = 2747.00, *z* = -0.213, *p* = .831	*U* = 1071.00, *z* = -0.797, *p* = .426
CEAS			
Engagement	*U* = 2803.00, *z* = -0.092, *p* = .927	*U* = 2433.00, *z* = -1.370, *p* = .171	*U* = 1056.00, *z* = -0.903, *p* = .366
Action	*U* = 2781.00, *z* = -0.172, *p* = .863	*U* = 2505.00, *z* =-1.050, *p* = .269	*U* = 1023.00, *z* = -1.136, *p* = .256
FSCRS			
Hated Self	*U* = 2600.00, *z* = -0.838, *p* = .927	*U* = 2528.00, *z* = -1.022, *p* = .307	*U* = 1101.50, *z* = -0.583, *p* =.560
Reassured Self	*U* = 2776.50, *z* = -0.189, *p* = .850	*U* = 2552.50, *z* = -1.041, *p* = .298	*U* = 1154.50, *z* = -0.208, *p* =.835
Inadequate Self	*U* = 2475.50, *z* = -1.295, *p* = .195	*U* = 2536.50, *z* = -0.989, *p* = .323	*U* = 1184.00, *z* = 0.000, *p* = 1.000
WEMWBS	*U* = 2796.00, *z* = -0.117, *p* = .907	*U*= 2503.50, *z* = -1.110, *p* = .267	*U* = 1089.00, *z*= -0.670, *p* = .503

Note. DDS=Diabetes Distress Scale; EISS=External and Internal Shame Scale; CEAS=Compassionate Engagement and Action Scale; FSCRS=Forms of Self-Criticising and Self-Reassuring Scale; WEMWBS=Warwick-Edinburgh Mental Wellbeing Scale.

[a] Analysis collapsed between groups to include intervention and waitlist control group participants.

Intervention Acceptability

Intervention group participants who completed the post-intervention questionnaire were asked to self-report how many sessions of the self-compassion intervention they completed. All four sessions (including the summary session) were completed by 86.7% (n=13) of participants, whilst two participants only completed the first session. 80% (n=12) managed to complete the intervention within four-weeks. Table 14 reports how many of the participants practiced the self-compassion exercises at post-intervention and follow-up. Whilst 80% (n=12) of the participants practiced the exercises throughout the intervention, 20% (n=3) did not practice at all. At follow-up, 70% (n=12) continued to practice the strategies learnt in the intervention. There were no significant associations established for post-intervention session practice and baseline outcome measure scores, $p > .05$ (Appendix R).

Table 14

Session Practice

	Not at all	1-2 times a week	3-4 times a week	5-6 times a week
Practice (Time 1)	3	7	4	1
Practice (Time 2)	5	11	1	0

Table 15 indicates that most of the participants found the intervention 'very helpful' at post-intervention. Two participants reported that the intervention was 'not at all helpful'. At follow-up, helpfulness was mostly categorised as 'somewhat' and 'very helpful'.

Table 15

Helpfulness

	Not at all Helpful	Neither Helpful nor Unhelpful	Somewhat Helpful	Very Helpful
Helpfulness (Time 1)	2	1	4	8
Helpfulness (Time 2)	1	4	6	6

Discussion

Summary

This study aimed to evaluate an online, brief, self-help CMT intervention for people with T1DM and T2DM, which was primarily assessed through change in diabetes-related distress at post-intervention. The RCT demonstrated preliminary, significant differences of total DDS change scores between the intervention and WLC group at post-intervention and follow-up. Scores were in the direction of significant improvement within the intervention group, reducing from high to moderate distress. There were mixed findings for sub-scales of the DDS, secondary outcome measures and HbA1c change scores which were either non-significantly different between-groups at post-intervention and follow-up, or did not remain significantly different when adjustments were made for multiple comparisons. The exception however was the change in internal shame scores. Between-group comparison at post-intervention withstood the adjusted multiple comparison significance level, and further within-group comparison indicated that internal shame scores were only in the direction of significant improvement within the intervention group. Although these initial findings are promising and indicative of improvement for diabetes-related distress and internal shame, paired with encouraging indications of acceptability from most intervention completers, the findings should be considered tentatively until replicated given the small sample sizes at post-intervention and follow-up.

Strengths

The RCT was pre-registered with an a priori primary outcome for the post-intervention timepoint. Thus, a strength includes the cautious analysis of secondary outcomes and presentation of findings with and without Bonferroni adjustments (Li et al., 2017; Streiner, 2015). This offers readers the opportunity to interpret the findings with respect to

study quality and the wider debate of meaningful conclusions relative to type one and two errors (Ranganathan et al., 2016).

Previous research reported that unguided, self-help interventions did not significantly reduce diabetes-related distress (Wicaksana et al., 2024). However, the current study lends weight to the effectiveness of an online, unguided CMT intervention in this population by indicating the improvement of diabetes-related distress, as seen in Kılıç et al's. (2023) intervention, and internal shame. It was not unnoticed that without Bonferroni adjustments, changes in wellbeing, fears of self-compassion, and engagement with self-compassion scores significantly differed between groups, replicating prior research using the same intervention (Northover et al., 2021; Wolke, 2022). Therefore, the conservative nature of this study could support the replication of a well-powered trial to understand whether the findings of secondary outcomes were minimised due to type two errors from multiple comparison adjustments.

As recruitment methods were successful in generating initial participant uptake, analysis to understand attrition strengthened the study. Given that there were no significant differences in baseline demographics or outcome measures between completers versus non-completers at post-intervention and follow-up, nor post-intervention study non-completers between the intervention and WLC group, the current sample could be considered appropriately randomised and unbiased. In Northover et al's. (2022) comparable research of the same CMT, self-help intervention, completer versus non-completer analysis indicated significant baseline differences of wellbeing, reassured self, depression, and shame, without baseline demographic differences in a general public sample. This study had a similar trend to the CPHC sample who used the same intervention, where no significant differences for completers versus non-completers were established (Wolke, 2022). Nonetheless, it is

reasonable to consider that there were unmeasured differences within this and Wolke's (2022) study.

As recommended by previous literature (Wakelin et al., 2022), this RCT reported the sub-scale scores using intention-to-treat descriptive statistics, which could be included in future meta-analyses for self-compassion interventions within this population. Furthermore, the study used the CEAS which is the corresponding self-compassion measure for the theoretical model of this intervention (Gilbert et al., 2017; Hughes et al., 2021; Wolke, 2022). Despite not remaining significant after a multiple comparison adjustment, the intervention demonstrated a change in self-compassion through the engagement sub-scale.

Acceptability questions that were completed at post-intervention and follow-up provided insight into participant experiences. In general, there were trends for intervention helpfulness and practice of the strategies, with most participants completing the intervention within the allocated four-weeks. Although findings replicated Wolke (2022) by suggesting that there were no underlying associations between the amount of self-compassion practise and baseline outcome measures, this may be a type two error from the underpowered sample.

Limitations

Whilst there were indications of improvement, findings should be cautiously interpreted based on the non-parametric tests that were conducted due to non-normal distributions of some variables. Another important limitation of the RCT includes the high attrition rates with the underpowered sample sizes at post-intervention and follow-up, particularly within the intervention group. Whilst attrition is common in unguided self-help RCTs (Karyotaki et al., 2015), it could be suggested that individuals in the WLC group returned given the incentive of receiving a self-compassion intervention at the final timepoint. Although it remains uncertain how many participants in the intervention group completed the intervention without completing the outcome measures, it is possible that

attrition could be due to participants finding the untailored intervention to be unhelpful or irrelevant (Jardine et al., 2024). As acceptability data highlighted that practice of strategies decreased at follow-up, perhaps this could indicate that non-completers had challenges protecting time for the intervention.

Studies have opted for drop-out questionnaires and interviews, though these have not been well completed by this population (Kılıç et al., 2023). However, the 76% attrition rate in this study was near to the 0-69.9% range of attrition reported in a meta-analysis (Ferrari et al., 2019) and 0-73.08% range of attrition reported in the authors systematic review of digital, self-compassion interventions for CPHCs. Comparison to research using the same intervention also revealed attrition similarities for this diabetes population, CPHCs and the general public (Northover et al., 2021; Wolke, 2022). As Friis et al's. (2016) MSC group intervention had a low drop-out rate with untailored diabetes content, perhaps the trends indicate a challenge associated with digital interventions.

The analysis of attrition highlighted that some participants returned to complete follow-up outcome measures, without returning at the post-intervention timepoint. This may suggest challenges related to longitudinal research and participant retention. It could be possible that the final timepoint had an increased number of participants based on a longer duration to complete the intervention, which may have been due to accessibility of technology, self-managing their condition, or external factors. As such, a limitation of this research included the lack of qualitative responses from participants that could determine reasons for adherence and attrition.

The current study had a limited understanding of the connection between participant demographics, research enrolment and intervention completion. Obtaining socioeconomic information could have demonstrated whether the online intervention contributed to enrolment and completion from those that were socioeconomically advantaged to access

digital interventions (Krukowski et al., 2024). In addition, asking participants to report religious or spiritual beliefs would have provided insight into who considered a self-compassion intervention to be acceptable, given that CMT emphasises evolutionary theory, which differs to other beliefs (Kolts et al., 2016). Given that these characteristics were unmeasured within the current study, they may have contributed to the attrition and patterns of non-completion.

There was a higher proportion of individuals with T1DM recruited to this study, who were mostly female, with a White British ethnicity. Although these demographic characteristics are similar to other self-compassion interventions (Kılıç et al., 2023; Northover et al., 2021; Wakelin et al., 2022; Wolke, 2022) and online diabetes interventions (Muijs et al., 2021), the results from this study may not be generalisable to men, those from other backgrounds, or people with diabetes that are referred for emotional support.

It was previously proposed that online interventions may be more appropriate to Asian populations who may experience stigma, shame and self-criticism when seeking support (Kariyawasam et al., 2023), though people with T2DM who are often non-White, were not representative in the current sample (Goff, 2019; Mathur et al., 2020). As the intervention was only available in English, this could have contributed to a language barrier and influenced who enrolled in the research. Furthermore, this sample did not have many participants above the age of 65 and it could be considered that this was not an acceptable intervention for the age group or recruitment methods did not adequately target this age group. Barriers of an online, self-help CMT intervention should be considered, perhaps through qualitative methods, to improve healthcare access and reduce inequalities.

The project attempted to assess changes in self-reported HbA1c as recommended by Kirby (2016). Few participants provided baseline and follow-up HbA1c data, with no indication of change at follow-up, unlike Friis et al's. (2016) improvement which informed

the hypothesis of this study. As discussed in a prior review with mixed HbA1c changes (Schmidt et al., 2018), intervention duration could be one factor to consider, as the self-help CMT intervention was significantly shorter (two hours total) than Friis et al's. (2016) intervention (20 hours total). As HbA1c in both groups of this study was near to clinical recommendations (NICE, 2015a, 2015b; Phillips & Hine, 2021), it could be harder to detect physiological change with a short intervention duration and minimal follow-up timepoint. Whilst this could be a purely non-significant change in HbA1c, given the low reporting rate, it may have been influenced by the self-reported nature which relied on individuals remembering or knowing where to access HbA1c levels, or perhaps be connected to individuals who missed diabetes appointments and HbA1c measurements due to stigma (Diabetes UK, 2023b; Schabert et al., 2013).

Implications

Based on the strengths and limitations, theoretical, research, and clinical implications have been proposed.

Theoretical Implications

As described by Gilbert (2014), the emotion regulation system infers that "threats of shame" (p.32) arise with threats of self-criticism, and down-regulation of this threat can be promoted using CMT strategies, which activate soothing (Gilbert, 2009). Within this research project, there were no significant changes in self-criticism, but diabetes-related distress and internal shame were revealed to improve at post-intervention. Engagement with self-compassion also improved when compared to the WLC at post-intervention, despite not withstanding multiple comparison corrections. The current findings are consistent with the idea that diabetes-related distress could be representative of a type of threat to individuals, as well as a trigger for self-criticism, as recognised in prior research with T1DM (Hinds, 2023) and T2DM populations (Kane et al., 2018). As pathways involving diabetes-related distress

were not assessed in this study, research with larger samples could help to identify which mechanisms contributed to the current findings and whether further significant differences are established, presenting possible emotion regulation pathways that occur in people with T1DM and T2DM (Hughes et al., 2021).

Literature has proposed differing associations for age at diagnosis and duration of diagnosis with levels of self-compassion for people with T1DM and T2DM (Barker et al., 2023; Charzyńska et al., 2020). In the current study, both groups were similar in baseline outcome measures scores and were predominately reporting longer durations of diagnoses, similar medication management, and presence of other medical conditions. The only significant difference was an under-representation of individuals with T2DM in the WLC group. Therefore, it would be useful to improve the understanding of individual factors that may contribute towards developing self-compassion via an intervention, in the two distinct conditions.

Research has recognised the interplay of condition self-management with diabetes-related distress and self-compassion (Sandham & Deacon, 2023; Semenchuk et al., 2022; Skinner et al., 2020). This study had a non-significant change in HbA1c, but the Diabetes Self-Management Questionnaire was not utilised (Schmitt et al., 2013). This may have offered insight into behaviours that possibly impact changes in HbA1c (Semenchuk et al., 2022). Therefore, developing the understanding of theoretical pathways for behavioural, physiological, and psychological improvements following self-compassion interventions, would be beneficial for this population.

Research Implications

There could be scope for a future RCT to compare a WLC group and an active control group using the current unguided intervention, with a CMT intervention that has been tailored to diabetes type or specific diabetes-related challenge (Baumeister et al., 2022; Schmidt et al.,

2018). This could indicate intervention effectiveness through changes in outcomes, intervention acceptability and participant retention, indicating improvements that may be needed to the current intervention.

To explore participant experiences and their intervention usage, larger trials could opt for mixed methods designs to contextualise research findings (Skivington et al., 2021). A separate researcher interviewed participants from the brief, self-help CMT intervention, highlighting that the general public sample experienced some challenges developing self-compassion (Deacon et al., 2021). Therefore, research would benefit from exploring whether a guided intervention for diabetes populations improves outcomes.

Future research should carefully consider which self-reported measures would be useful to include. Although wellbeing was assessed, specific mental health presentations were unmeasured in the current study and may have contributed to unknown biases, given the presence of depression and diabetes-related distress in this population (Fisher et al., 2010). The flows and fears of compassion to and from others were also unmeasured. If all sub-scales of the CEAS and FCS were used, perhaps it would have offered insight into the theoretical underpinnings of compassion fears and development for this population, as care receiving and giving contribute to the development of self-compassion (Kirby et al., 2019). Additionally, it could be of relevance to assess whether the primary outcome remains significant with an alternative or briefer measure of diabetes-related distress.

Literature has suggested that mediation and moderation analyses are necessary to consider mechanisms of change (Kirby, 2016). Though this analysis was not pre-registered for the current study, it should be considered within future research proposals, given the changes in scores observed at post-intervention and follow-up, irrespective of Bonferroni corrections in this study. It would also be beneficial to stratify analysis by T1DM and T2DM

if samples were large enough, to present the pathways that contribute towards effectiveness and acceptability of an online, self-help CMT intervention, respective to each condition.

People with diabetes are recommended to attend structured education courses for managing their condition (NICE, 2015a, 2015b). The courses have promising psychological and condition management outcomes and are increasingly being tailored to diverse populations diagnosed with T2DM (Goff et al., 2021; Hadjiconstantinou et al., 2021). To continue improving physical and psychological wellbeing, researchers should evaluate how self-compassion interventions can be culturally adapted and embedded into condition-specific structured education (Sachar et al., 2023).

Clinical Practice Implications

As CPHC pathways continue to develop within the NHS, next steps would be to understand the real-world application of the brief, self-help CMT intervention within physical or mental health services that support people with diabetes (Diabetes UK, 2019). One proposition involves assessing whether the digital, self-help intervention can be routinely offered, or completed whilst on a waitlist for emotional support. This could be informed by diabetes or IAPT services auditing routine outcome measures of diabetes-related distress, alongside measures of self-criticism and shame, based on the prevalence within this population (Sachar et al., 2023).

The current study had participants with T1DM and T2DM from the general public, rather than clinical services. Therefore, diabetes services could assess the generalisability of the intervention with specific populations, for instance those with low self-compassion, high diabetes-related distress, high HbA1c or increased diabetes complications. The outcomes and feedback from service users could inform how Clinical Psychologists tailor the intervention content. This could include creating a separate intervention for people with T1DM and T2DM, or designing interventions with specific diabetes topics, such as improving self-

compassion in relation to diabetes self-management behaviours. In each of these opportunities to tailor the intervention, CMT content should use diabetes-specific examples, which may improve engagement and change psychological and physiological outcomes within clinical services. Alternatively, if the current intervention was used with guided adaptations, a healthcare professional could implement weekly phone calls to assess progress, and offer physical or psychological support (Williams & Martinez, 2008; Winkley et al., 2020), possibly improving adherence of strategies developed from the online intervention. Finally, given the familiarity that this population has with structured education programmes that are group-based, Clinical Psychologists should consider assessing the acceptability and effectiveness of a possible digital or face-to-face CMT group. This may simultaneously offer individuals psychological knowledge and peer support (Snoek et al., 2024), whilst improving accessibility of interventions that improve self-compassion for this population.

Conclusion

The current RCT demonstrated initial findings supporting the use of an online, brief, self-help CMT intervention for people with T1DM and T2DM. This was indicated by the observed changes in diabetes-related distress and internal shame, and intervention acceptability. The strengths and limitations of conducting a RCT for an online, self-help, CMT intervention were acknowledged, informing suggestions for self-compassion interventions that may be offered as future research or clinical interventions to T1DM and T2DM populations.

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Section C: Appendix of Supporting Material for MRP

Appendix A: Clinical Trials Registration

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Appendix B: RCT Checklist

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Appendix C: Ethical Approval and Summary of Findings for Ethics and Participants

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Appendix D: Participant Information Sheet and Consent Form

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Appendix E: Screening Questions and Non-Eligibility Message with Support Information

Canterbury Christ Church University

Thank you for your interest in taking part in this research project. Please take a moment to carefully answer the following questions to make sure the research project is right for you.

This research project is for people who have either Type 1 or Type 2 Diabetes Mellitus. Please select one of the following options:

- ◯ I have Type 1 Diabetes Mellitus
- ◯ I have Type 2 Diabetes Mellitus
- ◯ I do not have Type 1 or 2 Diabetes Mellitus

How long have you been diagnosed with either Type 1 Diabetes Mellitus or Type 2 Diabetes Mellitus?

- ◯ <1 year
- ◯ 1-5 years
- ◯ 6-10 years
- ◯ 11-15 years
- ◯ 16-20 years
- ◯ 21+ years

Please indicate whether you will be able to access the internet to complete the weekly programme and questionnaires over the next twelve weeks.

- ◯ Yes, I have a computer/laptop/smartphone that I can use
- ◯ No, I do not have a computer/laptop/smartphone that I can use

This research project is for people who live in the UK. Please select where you are located:

- ◯ I live in the UK
- ◯ I do not live in the UK

This research project is only available in English. Please select one of the below options:

- ◯ I am able to read and understand English
- ◯ I am unable to read and understand English

This research project is unable to include people who are currently accessing psychological therapy. Please select one of the following options relating to your experience of psychological therapy or input:

- ◯ I am currently accessing psychological therapy
- ◯ I have previously accessed psychological therapy to manage my physical health and/or mental health wellbeing in the past
- ◯ I have never accessed psychological therapy

Please select one of the following options relating to whether you feel at risk of deliberately self-harming or ending your life:

- ◯ I feel at risk of deliberately self-harming or ending my life
- ◯ I do not feel at risk of deliberately self-harming or ending my life

Please select one of the following options relating to whether you are currently experiencing a mental health crisis:

- ◯ I am currently experiencing a mental health crisis
- ◯ I am not currently experiencing a mental health crisis

Canterbury Christ Church University

Thank you for taking the time to complete the screening questionnaire.

This project is offering support for people who have Type 1 Diabetes Mellitus or Type 2 Diabetes Mellitus. Unfortunately, one or more of your answers to the previous screening questions indicated that you were ineligible to participate in this project due to not meeting the criteria, as outlined in the Information Sheet.

Should you need further support, the following organisations are recommendations to reach out to:

- Your GP.
- Your diabetes team.
  - Diabetes UK (Charity)
  - Website: https://www.diabetes.org.uk/
  - Helpline: 0345 123 2399
  - Email: helpline@diabetes.org.uk
- Hub of Hope (Mental Health Database)
  - Website: https://hubofhope.co.uk/
- NHS 111 Service (Get Medical Help)
  - Website: https://111.nhs.uk/
  - Telephone = 111
- NHS Find a Mental Health Service (Mental Health Services)
  - Website: https://www.nhs.uk/nhs-services/mental-health-services/
- Samaritans (Charity)
  - Website: https://www.samaritans.org/?nation=wales
  - Telephone: 116 123
- Crisisline and Shout (Charity)
  - Website: https://giveusashout.org/get-help/
  - Website: https://www.crisistextline.org/
  - Text: 85258

Appendix F: Recruitment Posters/Web-Pages

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Appendix G: Demographic Questions

Please take a moment to complete the below questions which are used to gather anonymised information about you.

What is your age?

- ○ 18-24
- ○ 25-34
- ○ 35-44
- ○ 45-54
- ○ 55-64
- ○ 65+

What is your gender?

- ○ Male
- ○ Female
- ○ Non-binary
- ○ Transgender
- ○ Other

What is your ethnicity?

- ○ Asian or Asian British
- ○ Black or Black British, Caribbean or African
- ○ Mixed or multiple ethnic groups
- ○ White
- ○ Other - please specify:

Do you identify as having a disability? Under the Equality Act (2010), the term disability is defined as having "a physical or mental impairment" which "has a substantial and long-term adverse effect on your ability to carry out normal day-to-day activities"

- ○ Yes
- ○ No

Please indicate what you currently take to manage your Type 1 or Type 2 Diabetes Mellitus:

- ○ Insulin
- ○ Tablets e.g. Metformin
- ○ I do not currently take medication

Please select the month that your HbA1c was last taken.

Please select the year that your HbA1c was last taken.

Please indicate your most recent HbA1c in mmol/mol.

Note: Your HbA1c is an average glucose reading that is taken by a medical professional every three to six months.

If you are unsure of you last HbA1c, please enter 0.

Do you identify as having another medical condition alongside Type 1 or Type 2 Diabetes Mellitus?

- ◯ Yes
- ◯ No

Thank you for completing questions about you. On the following pages, you will be asked to complete six questionnaires in full. These should take you a minimum of 20 minutes to complete. If you require a break, please pause when needed.

Appendix H: Diabetes Distress Scale

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Appendix I: External and Internal Shame Scale

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Appendix J: Fears of Compassion Scale

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Appendix K: Compassionate Engagement and Action Scale

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Appendix L: Forms of Self-Criticising and Self-Reassuring Scale

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Appendix M: Warwick Edinburgh Mental Wellbeing Scale

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Appendix N: Acceptability Questions

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Appendix O: Balanced Minds Intervention

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Appendix P: Normal Distribution of Intervention & Control Variables

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	GroupRecoded	Statistic	df	Sig.	Statistic	df	Sig.
DDSTotal_T0	Intervention	.071	79	.200*	.981	79	.283
	Control	.065	78	.200*	.980	78	.249
DDSEmotionalBurden_T0	Intervention	.114	79	.012	.960	79	.014
	Control	.108	78	.025	.968	78	.045
DDSPhysicianDistress_T0	Intervention	.118	79	.008	.955	79	.007
	Control	.079	78	.200*	.972	78	.084
DDSRegimenDistress_T0	Intervention	.107	79	.026	.963	79	.022
	Control	.082	78	.200*	.970	78	.064
DDSInterpersonalDistress_T0	Intervention	.082	79	.200*	.970	79	.057
	Control	.130	78	.002	.959	78	.014
EISSExternalShame_T0	Intervention	.109	79	.022	.965	79	.031
	Control	.104	78	.037	.978	78	.209
EISSInternalShame_T0	Intervention	.113	79	.014	.967	79	.039
	Control	.097	78	.066	.973	78	.093
FCS_T0	Intervention	.084	79	.200*	.968	79	.045
	Control	.057	78	.200*	.975	78	.127
FSCRSInadequateSelf_T0	Intervention	.166	79	<.001	.915	79	<.001
	Control	.138	78	<.001	.938	78	<.001
FSCRSReassuredSelf_T0	Intervention	.099	79	.052	.961	79	.016
	Control	.105	78	.032	.984	78	.455
FSCRSHatedSelf_T0	Intervention	.106	79	.029	.941	79	.001
	Control	.128	78	.003	.956	78	.009
CEASEngagementT0	Intervention	.076	79	.200*	.983	79	.357
	Control	.079	78	.200*	.982	78	.341
CEASAction_T0	Intervention	.086	79	.200*	.966	79	.035
	Control	.088	78	.200*	.974	78	.108
WEMWBSTotal_T0	Intervention	.058	79	.200*	.978	79	.193
	Control	.094	78	.082	.976	78	.144

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	GroupRecoded	Statistic	df	Sig.	Statistic	df	Sig.
HbA1cBaseline	Intervention	.194	46	<.001	.777	46	<.001
	Control	.106	42	.200*	.965	42	.218

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Descriptive Statistics

GroupRecoded		N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Skewness Std. Error	Kurtosis Statistic	Kurtosis Std. Error
Intervention	DDSTotal_T0	79	1.18	5.53	3.1638	1.03487	.176	.271	-.756	.535
	DDSEmotionalBurden_T0	79	1.00	5.60	3.0759	1.16412	.390	.271	-.749	.535
	DDSPhysicianDistress_T0	79	1.25	5.75	3.3418	1.19707	.408	.271	-.650	.535
	DDSRegimenDistress_T0	79	1.20	5.60	2.8987	1.03966	.556	.271	-.218	.535
	DDSInterpersonalDistress_T0	79	1.00	6.00	3.5148	1.26851	-.109	.271	-.884	.535
	EISSExternalShame_T0	79	.00	15.00	7.8354	3.29502	-.416	.271	.330	.535
	EISSInternalShame_T0	79	.00	15.00	8.4304	3.87855	-.261	.271	-.720	.535
	FCS_T0	79	.00	54.00	22.6329	14.10781	.366	.271	-.606	.535
	FSCRSInadequateSelf_T0	79	.00	36.00	23.4684	9.39836	-.769	.271	-.441	.535
	FSCRSReassuredSelf_T0	79	1.00	32.00	14.5063	6.81979	.617	.271	.415	.535
	FSCRSHatedSelf_T0	79	.00	20.00	6.5190	5.13625	.461	.271	-.613	.535
	CEASEngagementT0	79	6.00	57.00	31.9620	9.73422	.304	.271	.457	.535
	CEASAction_T0	79	6.00	40.00	20.6835	8.37509	.365	.271	-.672	.535
	WEMWBSTotal_T0	79	14.00	70.00	40.5949	10.83030	.418	.271	.304	.535
	Valid N (listwise)	79								
Control	DDSTotal_T0	78	1.24	5.94	3.1976	1.05325	.187	.272	-.577	.538
	DDSEmotionalBurden_T0	78	1.20	6.00	3.2436	1.18416	.260	.272	-.810	.538
	DDSPhysicianDistress_T0	78	1.25	6.00	3.2692	1.17106	.252	.272	-.648	.538
	DDSRegimenDistress_T0	78	1.00	5.80	2.9333	1.09291	.417	.272	-.285	.538
	DDSInterpersonalDistress_T0	78	1.33	6.00	3.4658	1.21361	.099	.272	-1.026	.538
	EISSExternalShame_T0	78	.00	16.00	7.7821	3.49265	-.149	.272	-.185	.538
	EISSInternalShame_T0	78	.00	16.00	8.1795	3.90718	-.285	.272	-.561	.538
	FCS_T0	78	.00	60.00	24.6923	13.82573	.013	.272	-.644	.538
	FSCRSInadequateSelf_T0	78	.00	36.00	23.7821	8.83565	-.550	.272	-.563	.538
	FSCRSReassuredSelf_T0	78	1.00	30.00	14.0897	5.89119	.326	.272	.070	.538
	FSCRSHatedSelf_T0	78	.00	19.00	7.0000	4.88571	.422	.272	-.613	.538
	CEASEngagementT0	78	10.00	55.00	31.8333	8.87345	.034	.272	-.190	.538
	CEASAction_T0	78	4.00	39.00	20.0000	8.05823	.434	.272	-.316	.538
	WEMWBSTotal_T0	78	17.00	61.00	41.5385	8.87970	-.064	.272	.227	.538
	Valid N (listwise)	78								

Descriptive Statistics

GroupRecoded		N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Skewness Std. Error	Kurtosis Statistic	Kurtosis Std. Error
Intervention	HbA1cBaseline	46	37	162	59.57	22.423	2.454	.350	8.863	.688
	Valid N (listwise)	46								
Control	HbA1cBaseline	42	32	88	55.60	12.394	.627	.365	.472	.717
	Valid N (listwise)	42								

Tests of Normality

	GroupRecoded	Kolmogorov-Smirnov[a] Statistic	df	Sig.	Shapiro-Wilk Statistic	df	Sig.
DDSTotal_T1	Intervention	.162	15	.200*	.923	15	.217
	Control	.090	41	.200*	.963	41	.202
DDSEmotionalBurden_T1	Intervention	.190	15	.149	.910	15	.135
	Control	.133	41	.066	.935	41	.021
DDSPhysicianDistress_T1	Intervention	.157	15	.200*	.918	15	.179
	Control	.093	41	.200*	.960	41	.159
DDSRegimenDistress_T1	Intervention	.243	15	.017	.795	15	.003
	Control	.107	41	.200*	.960	41	.163
DDSInterpersonalDistress_T1	Intervention	.196	15	.126	.889	15	.065
	Control	.181	41	.002	.933	41	.018
EISSExternalShame_T1	Intervention	.167	15	.200*	.957	15	.635
	Control	.127	41	.097	.979	41	.652
EISSInternalShame_T1	Intervention	.116	15	.200*	.959	15	.677
	Control	.138	41	.048	.925	41	.010
FCS_T1	Intervention	.197	15	.120	.866	15	.029
	Control	.137	41	.050	.943	41	.039
FSCRSInadequateSelf_T1	Intervention	.190	15	.148	.887	15	.060
	Control	.150	41	.021	.933	41	.018
FSCRSReassuredSelf_T1	Intervention	.214	15	.064	.929	15	.260
	Control	.141	41	.039	.957	41	.125
FSCRSHatedSelf_T1	Intervention	.248	15	.014	.760	15	.001
	Control	.106	41	.200*	.941	41	.035
CEASEngagementT1	Intervention	.174	15	.200*	.957	15	.649
	Control	.109	41	.200*	.977	41	.578
CEASAction_T1	Intervention	.212	15	.068	.915	15	.163
	Control	.078	41	.200*	.966	41	.246
WEMWBSTotal_T1	Intervention	.165	15	.200*	.947	15	.486
	Control	.056	41	.200*	.974	41	.463

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Descriptive Statistics

GroupRecoded		N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Skewness Std. Error	Kurtosis Statistic	Kurtosis Std. Error
Intervention	DDSTotal_T1	15	1.18	5.24	2.6588	1.17714	.632	.580	-.299	1.121
	DDSEmotionalBurden_T1	15	1.00	5.20	2.7733	1.41999	.504	.580	-1.164	1.121
	DDSPhysicianDistress_T1	15	1.25	5.25	2.9000	1.31203	.408	.580	-1.238	1.121
	DDSRegimenDistress_T1	15	1.20	5.20	2.1867	1.05415	1.887	.580	4.019	1.121
	DDSInterpersonalDistress_T1	15	1.33	6.00	2.9333	1.52856	.748	.580	-.644	1.121
	EISSExternalShame_T1	15	.00	13.00	6.3333	3.43650	.002	.580	-.294	1.121
	EISSInternalShame_T1	15	.00	13.00	6.2000	4.09180	-.014	.580	-.981	1.121
	FCS_T1	15	.00	42.00	15.2667	14.80573	.789	.580	-.791	1.121
	FSCRSInadequateSelf_T1	15	5.00	30.00	18.8000	8.91387	-.318	.580	-1.630	1.121
	FSCRSReassuredSelf_T1	15	7.00	32.00	16.6667	6.76827	.898	.580	.874	1.121
	FSCRSHatedSelf_T1	15	.00	15.00	4.3333	5.10835	1.331	.580	.359	1.121
	CEASEngagementT1	15	15.00	52.00	35.0000	9.95705	-.405	.580	.330	1.121
	CEASAction_T1	15	15.00	39.00	24.6000	7.50048	.609	.580	-.510	1.121
	WEMWBSTotal_T1	15	25.00	64.00	47.3333	9.66338	-.318	.580	1.321	1.121
	Valid N (listwise)	15								
Control	DDSTotal_T1	41	1.12	5.59	3.1736	1.20817	.253	.369	-.885	.724
	DDSEmotionalBurden_T1	41	1.00	5.20	3.2098	1.24415	.247	.369	-1.062	.724
	DDSPhysicianDistress_T1	41	1.25	6.00	3.3110	1.33203	.167	.369	-.939	.724
	DDSRegimenDistress_T1	41	1.20	6.00	2.9561	1.17772	.521	.369	-.246	.724
	DDSInterpersonalDistress_T1	41	1.00	6.00	3.2927	1.43990	.111	.369	-1.188	.724
	EISSExternalShame_T1	41	.00	15.00	7.6341	3.54088	-.179	.369	-.184	.724
	EISSInternalShame_T1	41	.00	15.00	7.8780	4.18447	-.420	.369	-1.046	.724
	FCS_T1	41	.00	51.00	23.0488	15.50637	.163	.369	-1.148	.724
	FSCRSInadequateSelf_T1	41	3.00	35.00	21.9512	9.12949	-.505	.369	-.913	.724
	FSCRSReassuredSelf_T1	41	.00	32.00	15.7317	7.61585	.454	.369	.027	.724
	FSCRSHatedSelf_T1	41	.00	18.00	6.9024	5.19040	.413	.369	-.724	.724
	CEASEngagementT1	41	18.00	56.00	34.6829	9.20174	.310	.369	-.263	.724
	CEASAction_T1	41	6.00	36.00	22.2439	8.54921	-.104	.369	-.956	.724
	WEMWBSTotal_T1	41	17.00	56.00	41.1707	9.12388	-.309	.369	-.238	.724
	Valid N (listwise)	41								

Tests of Normality

	GroupRecoded	Kolmogorov-Smirnov[a] Statistic	df	Sig.	Shapiro-Wilk Statistic	df	Sig.
DDSTotal_T2	Intervention	.170	17	.200*	.902	17	.072
	Control	.129	38	.111	.940	38	.043
DDSEmotionalBurden_T2	Intervention	.193	17	.093	.873	17	.024
	Control	.128	38	.116	.939	38	.038
DDSPhysicianDistress_T2	Intervention	.215	17	.036	.911	17	.103
	Control	.156	38	.021	.942	38	.048
DDSRegimenDistress_T2	Intervention	.173	17	.188	.918	17	.136
	Control	.150	38	.030	.938	38	.036
DDSInterpersonalDistress_T2	Intervention	.207	17	.051	.906	17	.086
	Control	.108	38	.200*	.956	38	.144
EISSExternalShame_T2	Intervention	.154	17	.200*	.952	17	.486
	Control	.155	38	.022	.953	38	.115
EISSInternalShame_T2	Intervention	.182	17	.136	.926	17	.185
	Control	.138	38	.065	.935	38	.029
FCS_T2	Intervention	.199	17	.074	.866	17	.019
	Control	.112	38	.200*	.946	38	.067
FSCRSInadequateSelf_T2	Intervention	.130	17	.200*	.941	17	.330
	Control	.175	38	.005	.913	38	.006
FSCRSReassuredSelf_T2	Intervention	.124	17	.200*	.952	17	.485
	Control	.161	38	.014	.931	38	.022
FSCRSHatedSelf_T2	Intervention	.187	17	.115	.873	17	.025
	Control	.116	38	.200*	.931	38	.021
CEASEngagementT2	Intervention	.144	17	.200*	.923	17	.165
	Control	.082	38	.200*	.980	38	.722
CEASAction_T2	Intervention	.116	17	.200*	.967	17	.763
	Control	.098	38	.200*	.970	38	.396
WEMWBSTotal_T2	Intervention	.111	17	.200*	.977	17	.929
	Control	.090	38	.200*	.969	38	.376

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Tests of Normality

	GroupRecoded	Kolmogorov-Smirnov[a] Statistic	df	Sig.	Shapiro-Wilk Statistic	df	Sig.
HbA1cFollowup	Intervention	.283	10	.022	.746	10	.003
	Control	.160	18	.200*	.929	18	.184

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Descriptive Statistics

GroupRecoded		N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Skewness Std. Error	Kurtosis Statistic	Kurtosis Std. Error
Intervention	DDSTotal_T2	17	1.06	4.35	2.4360	1.03863	.605	.550	-1.015	1.063
	DDSEmotionalBurden_T2	17	1.00	4.20	2.3647	1.08221	.622	.550	-1.183	1.063
	DDSPhysicianDistress_T2	17	1.00	4.75	2.5735	1.18837	.659	.550	-.674	1.063
	DDSRegimenDistress_T2	17	1.20	4.00	2.2706	.85130	.731	.550	-.223	1.063
	DDSInterpersonalDistress_T2	17	1.00	5.67	2.6471	1.40174	.772	.550	-.428	1.063
	EISSExternalShame_T2	17	1.00	11.00	6.0588	2.98895	-.192	.550	-1.041	1.063
	EISSInternalShame_T2	17	1.00	16.00	6.7647	3.97696	.913	.550	.396	1.063
	FCS_T2	17	.00	30.00	10.8824	10.28884	.796	.550	-.766	1.063
	FSCRSInadequateSelf_T2	17	3.00	33.00	15.8235	9.05011	.264	.550	-.336	1.063
	FSCRSReassuredSelf_T2	17	9.00	31.00	18.6471	6.89149	.369	.550	-.912	1.063
	FSCRSHatedSelf_T2	17	.00	13.00	4.0588	4.22005	.796	.550	-.419	1.063
	CEASEngagementT2	17	24.00	50.00	36.8235	7.60128	.559	.550	-.176	1.063
	CEASAction_T2	17	4.00	39.00	24.5882	8.46359	-.484	.550	.937	1.063
	WEMWBSTotal_T2	17	32.00	67.00	48.8824	8.70260	.075	.550	-.055	1.063
	Valid N (listwise)	17								
Control	DDSTotal_T2	38	1.29	5.41	3.1192	1.24720	.124	.383	-1.176	.750
	DDSEmotionalBurden_T2	38	1.20	5.60	3.2263	1.32434	.189	.383	-1.238	.750
	DDSPhysicianDistress_T2	38	1.25	5.75	3.2237	1.37151	.141	.383	-1.184	.750
	DDSRegimenDistress_T2	38	1.20	5.60	2.8842	1.28411	.431	.383	-.900	.750
	DDSInterpersonalDistress_T2	38	1.00	5.67	3.1930	1.33925	.139	.383	-.993	.750
	EISSExternalShame_T2	38	.00	15.00	7.7895	3.81433	-.449	.383	-.342	.750
	EISSInternalShame_T2	38	.00	15.00	7.7368	4.03822	-.533	.383	-.459	.750
	FCS_T2	38	.00	53.00	23.3158	15.93925	.079	.383	-1.114	.750
	FSCRSInadequateSelf_T2	38	1.00	36.00	21.7632	9.93882	-.631	.383	-.807	.750
	FSCRSReassuredSelf_T2	38	3.00	32.00	15.5789	7.33238	.782	.383	.065	.750
	FSCRSHatedSelf_T2	38	.00	17.00	7.0000	5.33221	.186	.383	-1.098	.750
	CEASEngagementT2	38	17.00	56.00	33.9474	9.50660	.288	.383	-.339	.750
	CEASAction_T2	38	7.00	40.00	22.1316	8.56508	.321	.383	-.628	.750
	WEMWBSTotal_T2	38	23.00	66.00	41.8158	9.89091	.439	.383	-.392	.750
	Valid N (listwise)	38								

Descriptive Statistics

GroupRecoded		N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic	Skewness Std. Error	Kurtosis Statistic	Kurtosis Std. Error
Intervention	HbA1cFollowup	10	38.00	108.00	57.1000	19.52463	2.253	.687	6.036	1.334
	Valid N (listwise)	10								
Control	HbA1cFollowup	18	34.00	83.00	52.0556	12.42612	.948	.536	.831	1.038
	Valid N (listwise)	18								

Appendix Q: Completer vs Non-Completer & Study Non-Completer Descriptive Statistics

	Time 1 Completers vs. Non-Completers[a]				**Time 2 Completers vs. Non-Completers[a]**				**Intervention vs. Waitlist Control Study Non-Completers**			
	Completers (N=56)		Non-Completers (N=101)		Completers (N=55)		Non-Completers (N=102)		Intervention Non-Completers (N=64)		Waitlist Control Non-Completers (N=37)	
	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)
DDS	3.15 (1.04)	3.12 (1.75)	3.20 (1.04)	3.24 (1.53)	3.07 (1.11)	3.12 (1.82)	3.24 (1.01)	3.21 (1.50)	3.18 (1.05)	3.18 (1.57)	3.23 (1.05)	3.24 (1.53)
Emotional Burden	3.16 (1.05)	3.24 (1.53)	3.16 (1.19)	3.00 (1.90)	3.15 (1.23)	3.00 (2.00)	3.16 (1.15)	3.00 (1.80)	3.10 (1.19)	2.90 (1.80)	3.25 (1.19)	3.40 (1.90)
Physician Distress	3.30 (1.21)	3.25 (1.88)	3.31 (1.17)	3.25 (1.75)	3.19 (1.24)	3.25 (1.75)	3.37 (1.24)	3.25 (1.75)	3.34 (1.20)	3.25 (2.00)	3.25 (1.13)	3.25 (1.75)
Regimen Distress	2.89 (1.05)	3.00 (1.60)	2.93 (1.07)	2.80 (1.50)	2.80 (1.13)	2.60 (1.80)	2.98 (1.02)	2.80 (1.40)	2.90 (1.05)	2.60 (1.40)	2.98 (1.12)	2.80 (1.60)
Interpersonal Distress	3.37 (1.27)	3.33 (2.25)	3.56 (1.22)	3.33 (2.00)	3.27 (1.26)	3.33 (2.00)	3.61 (1.21)	3.67 (2.00)	3.53 (1.24)	3.33 (1.92)	3.60 (1.20)	3.67 (2.00)
EISS												
External Shame	7.79 (3.69)	8.00 (5.75)	7.82 (3.22)	8.00 (4.00)	7.75 (3.52)	8.00 (6.00)	7.84 (3.33)	8.00 (4.00)	7.88 (3.30)	8.00 (4.00)	7.73 (3.11)	8.00 (3.50)
Internal Shame	8.39 (4.10)	9.00 (6.75)	8.26 (3.78)	8.00 (5.00)	8.33 (3.86)	9.00 (6.00)	8.29 (3.91)	8.00 (5.00)	8.31 (3.96)	9.00 (6.50)	8.16 (3.50)	8.00 (3.50)
Fears of Self-Compassion	23.39 (13.47)	23.00 (19.25)	23.80 (14.29)	23.00 (20.50)	23.11 (13.58)	24.00 (19.00)	23.95 (14.22)	23.00 (20.50)	23.03 (14.79)	23.00 (22.50)	25.16 (13.48)	23.00 (18.00)
CEAS												
Engagement	31.98 (8.95)	32.00 (13.75)	31.85 (9.51)	32.00 (12.50)	33.07 (8.82)	34.00 (11.00)	31.26 (9.51)	30.50 (12.50)	32.73 (9.86)	32.50 (12.75)	30.32 (8.80)	31.00 (15.00)
Action	20.63 (8.21)	20.00 (11.75)	20.19 (8.23)	20.00 (12.00)	21.62 (9.10)	21.00 (15.00)	19.66 (7.36)	20.00 (10.25)	20.91 (8.52)	21.50 (14.75)	18.95 (7.66)	19.00 (9.50)
FSCRS												
Hated Self	6.27 (4.68)	6.00 (6.75)	7.03 (5.18)	7.00 (9.00)	6.18 (4.93)	5.00 (8.00)	7.07 (5.04)	7.00 (7.25)	6.86 (5.38)	7.00 (9.00)	7.32 (4.86)	7.00 (7.50)
Reassured Self	14.23 (6.40)	13.00 (7.00)	14.33 (6.37)	14.00 (8.00)	15.24 (7.27)	14.00 (9.00)	13.79 (5.78)	14.00 (7.00)	14.52 (7.10)	14.00 (8.00)	14.00 (4.92)	14.00 (5.50)
Inadequate Self	22.23 (9.60)	24.00 (15.00)	24.40 (8.76)	27.00 (13.00)	22.16 (10.49)	26.00 (18.00)	24.41 (8.20)	27.00 (13.25)	24.19 (9.24)	28.00 (13.75)	24.76 (7.96)	27.00 (12.50)
WEMWBS	41.57 (9.41)	39.00 (14.00)	40.78 (10.18)	40.00 (14.00)	42.62 (9.92)	41.00 (15.00)	40.22 (9.82)	40.00 (13.25)	40.50 (11.15)	40.00 (17.00)	41.27 (8.37)	42.00 (11.50)

Note. DDS=Diabetes Distress Scale; EISS=External and Internal Shame Scale; CEAS=Compassionate Engagement and Action Scale; FSCRS=Forms of Self-Criticising and Self-Reassuring Scale; WEMWBS=Warwick-Edinburgh Mental Wellbeing Scale.

[a] Analysis collapsed between groups to include intervention and waitlist control group participants.

	Time 1 Completers vs. Non-Completers[a]				**Time 2 Completers vs. Non-Completers[a]**				**Intervention vs. Waitlist Control Study Non-Completers at Post-Intervention**			
	Completers (N=29)		Non-Completers (N=59)		Completers (N=34)		Non-Completers (N=54)		Completers (N=39)		Non-Completers (N=20)	
	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)
HbA1c	59.90 (16.77)	56.00 (22.00)	56.57 (19.11)	53.00 (15.00)	56.24 (15.60)	53.00 (20.25)	58.57 (19.97)	54.00 (16.25)	59.90 (16.77)	56.00 (22.00)	56.58 (19.11)	53.00 (15.00)

[a] Analysis collapsed between groups to include intervention and waitlist control group participants.

Appendix R: Spearmans Correlation

Correlations

			EXERCISE PRACTISE	DDSTotal_T0	DDSEmotionalBurden_T0	DDSPhysicianDistress_T0	DDSRegimenDistress_T0	DDSInterpersonalDistress_T0
Spearman's rho	EXERCISE PRACTISE	Correlation Coefficient	1.000	-.006	-.014	-.023	-.235	.400
		Sig. (2-tailed)	.	.984	.959	.935	.398	.140
		N	15	15	15	15	15	15

Correlations

			EISSExternalShame_T0	EISSInternalShame_T0	FSCRSInadequateSelf_T0	FSCRSReassuredSelf_T0	FSCRSHatedSelf_T0	CEASEngagementT0	WEMWBSTotal_T0	FCS_T0
Spearman's rho	EXERCISE PRACTISE	Correlation Coefficient	-.315	-.393	-.219	-.004	-.207	.244	.147	-.402
		Sig. (2-tailed)	.253	.147	.433	.989	.458	.380	.600	.137
		N	15	15	15	15	15	15	15	15

Appendix S: Author Guidelines for Publication

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