VNIVERSITAT DE VALÈNCIA

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ATTACHMENT-BASED COMPASSION THERAPY:

EFFICACY OF AN ONLINE SELF-APPLIED INTERVENTION FOR IMPROVING QUALITY OF LIFE AND WELLBEING IN A CHRONIC MEDICAL ILLNESS POPULATION

TESIS DOCTORAL

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“It’s easy to love
the nice things about ourselves
but true self-love is
embracing the difficult parts
that live in all of us.”

-Rupi Kaur

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1. Introducció

Les malalties mèdiques cròniques (MMCs) es consideren alteracions físiques no transmissibles i de llarga durada que requereixen un tractament continuat o causen diverses alteracions en la vida quotidiana dels pacients. Aquestes malalties poden tenir conseqüències greus com l'hospitalització, la discapacitat de llarga durada o una disminució de la qualitat de vida (Buttorf, et al., 2017; Centers for Disease Control & Prevention, 2002; WHO, 2013)

S'ha estimat un gran augment de la prevalença d'aquestes condicions a causa de canvis significatius en la demografia i l'estil de vida (per exemple, l'augment de la població envellida) i altres factors socials i ambientals (Maresova et al., 2019; WHO, 2011). Es calcula que el 30% de les persones viuen amb una o més malalties físiques cròniques (Hajat & Stein, 2018). A Espanya s'estima que un 59,1% de les dones i un 49,3% dels homes de 15 i més anys presenten alguna malaltia crònica o problema de salut percebut, i aquests percentatges augmenten amb l'edat sent més elevada en dones per a tots els grups d'edat.

Aquestes taxes d'alta prevalença es podrien traduir en costos socials, personals i individuals. S'estima que una mitjana del 70% dels adults a tot el món moren per malalties somàtiques cròniques i les seues complicacions (Forouzanfar et al., 2016) i, a més, patir MMC durant llargs períodes de temps suposa un important augment de les despeses sanitàries el que suposa una gran càrrega en termes socioeconòmics i de pressupost sanitari (Centers for Disease Control & Prevention, 2009; WHO, 2019).

A més, aquestes malalties també presenten altes taxes de comorbiditat amb problemes de salut mental i afeccions mèdiques cròniques (Barnett et al., 2012; Salisbury, 2012).

En aquest sentit, diferents estudis han demostrat que persones amb malalties cròniques solen experimentar depressió o ansietat (Breivik et al. ., 2006; De Ornelas et al., 2012; Viganò et al., 2018) i obtenen resultats negatius de salut com baixa satisfacció amb la vida (Strine et al., 2008) o disminució de la qualitat de vida (Tóthová et al., 2014). Aquesta comorbiditat reflecteix una interacció recíproca, en la qual les conseqüències negatives de la malaltia no només depenen de l'evolució i la gravetat de la malaltia, sinó també d'altres processos psicològics. Per exemple, el procés d'adaptació psicològica a la malaltia, les estratègies d'afrontament per afrontar l'estrés associat a la malaltia i la gestió de la malaltia del pacient tenen una influència directa en la salut física, incloses la morbiditat, la mortalitat i les complicacions de la malaltia (Evers et al., 2014; Figueiras & Neto,2019; Tuccero et al., 2016; Vancampfort et al., 2017). Així mateix, diferents processos psicològics perjudicials com la vergonya relacionada amb la malaltia, l'autocrítica o la rumia, suposen una barrera per implementar comportaments d'autocura implicats en una gestió adaptativa de la malaltia, el que podria augmentar encara més l'angoixa, empitjorar el pronòstic i perjudicar la qualitat de vida (Callebaut et al., 2017; Dammers, 2020; Soo et al., 2009). Com a conseqüència, tant les conductes d'autocura incloses en la gestió de la malaltia com els processos psicològics perjudicials s'han convertit en objectiu de diferents intervencions psicològiques destinades a promoure la qualitat de vida de la població amb MMC (Carvalho et al., 2022).

Donat l'important paper que tenen els factors psicològics en aquestes malalties, les intervencions destinades a millorar la salut mental es consideren crucials per millorar la salut física general. Com a conseqüència, les guies clíniques coincideixen a recomanar enfocaments multidisciplinaris que segueixen un model biopsicosocial (inclosos aspectes mèdics, psicològics i socials) per al tractament de les MMC (Bierman et al., 2021; Legido-Quigley et al., 2013).

Les investigacions sobre l'eficàcia de les intervencions psicològiques per al tractament d'individus amb MMC han anat creixent durant l'última dècada i s'han centrat principalment en millorar l'adaptació a la malaltia i promoure un enfocament més actiu de la gestió diària de les conseqüències de la malaltia sobre la reducció de la simptomatologia fisiològica i en donar suport als pacients resistents al tractament per fer front a la intervenció mèdica (Anderson & Ozakinci, 2018; Petrie & Revenson, 2005). Amb aquest propòsit, la majoria de les intervencions psicològiques investigades per a persones amb afeccions mèdiques cròniques es basen en l'enfocament de la teràpia cognitiva conductual (TCC) i els programes d'autogestió de la malaltia (Audulv et al., 2012; Hoffman et al., 2012).

No obstant, limitacions d’aquestes intervencions com els problemes amb la disseminació i el no tenir en compte la variabilitat i comorbiditat entre les malalties han fet que siga necessari ampliar la recerca a nous enfocament que tinguen en compte els aspectes comuns entre les diferents malalties cròniques i que incorporen l’ús de les tecnologies de la informació i comunicació (TIC), ja que aquets enfocaments faciliten el tractament de les persones amb comorbiditat, redueixen els costos associats a la formació de professionals mentals i faciliten la difusió (Barlow et al., 2016; Brown et al., 2001; Osma et al., 2021).

En aquest sentit, es necessari continuar treballant cap a la innovació dels tractaments psicològics en el context de les malalties cròniques, on un enfocament bassat en la pràctica de la compassió i l'ús d'Internet com a eina innovadora s’han desenvolupat per intentar cobrir limitacions d’altres intervencions i millorar la difusió de tractaments basats en l'evidència.

Les intervencions basades en la compassió (IBC) fan referència a les intervencions psicològiques destinades a potenciar les respostes compassives i autocompassives que impliquen el reconeixement del sofriment i la inclinació a alleujar-lo amb un acte de bondat en lloc de criticar-se o culpar-se (Gilbert, 2009). La compassió i l'autocompassió poden ser un enfocament útil per a la gestió de la malaltia, ja que impliquen acceptar el patiment com una condició humana inevitable i faciliten el desenvolupament d’una actitud més amable i compassiva davant les dificultats (Neff, 2003).

Diversos estudis han demostrat que les IBC poden ser especialment beneficioses per millorar la qualitat de vida de les persones amb malalties cròniques (Friis et al., 2016; Lathren et al., 2018; Penlington, 2019). Dues revisions sistemàtiques recents han conclòs que les IBC són efectives en poblacions amb afeccions mèdiques cròniques, ja que els seus resultats van mostrar millores en diferents aspectes físics i psicològics com la depressió, l'ansietat, l'autocompassió i la qualitat de vida relacionada amb la salut (Austin et al., 2021; Kiliç et al., 2021). En resum, ser capaç d'abordar les dificultats amb una actitud compassiva ajuda a les persones a sentir-se empoderades amb noves estratègies de gestió i promou una sensació de calma i agència per proporcionar-se confort, la qual cosa facilita la implementació de comportaments d'autocura i gestió adaptativa de la malaltia (Morgan et al., 2020; Sirois et al., 2015).

Una de les IBC que ha demostrat la seua eficàcia tant en població sana com en pacients amb afeccions mèdiques cròniques és la Teràpia de Compassió Basada en l’Aferrament (TCBA) (García-Campayo et al., 2016). Aquesta teràpia es basa en la teoria de l’aferrament (Fearon & Roisman, 2017), que proporciona un marc per entendre els vincles entre les relacions properes i la psicopatologia i inclou pràctiques específiques per identificar i desenvolupar un estil d'aferrament segur per promoure la compassió cap a un mateix i els altres (García-Campayo et al., 2016). Concretament, la TCBA ha demostrat la seua eficàcia i aplicabilitat per al tractament de la fibromiàlgia mostrant millores tant en aspectes psicològics com l'estat funcional (Montero-Marín et al., 2018) i en aspectes biològics (Montero-Marín et al., 2019).

Hi ha barreres específiques de lliurament que podrien interferir amb l'eficàcia de les IBC en persones amb malalties cròniques, com ara limitacions d'accés, mobilitat o transport. Per fer front a aquestes limitacions i respondre a la creixent necessitat dels sistemes sanitaris d'escalabilitat i sostenibilitat, les intervencions basades en l'evidència es poden beneficiar d'adaptar el seu format de lliurament a través de les tecnologies de la informació i les comunicacions (TIC) (Jerant et al., 2005; Karekla et al. al., 2019). De fet, investigacions anteriors donen suport a la idea que aspectes psicològics de les persones que viuen amb malalties cròniques es poden millorar amb una intervenció *online* autoadministrada (per exemple, Elbert et al., 2014; McGeary et al., 2012), i l'evidència incipient mostra valor potencial de lliurar IBC online en el context de malalties cròniques (Finlay-Jones et al., 2020; Prentice et al., 2021). A més, altres resultats mostren que l'adaptació de les IBC a un format *online* pot millorar l'adherència i facilitar la implicació dels pacients crònics en una millor gestió de la seua malaltia (Karekla et al., 2019). Pel que fa a l'enfocament TCBA, s'ha desenvolupat una versió *online* (iTCBA) per ser totalment autoaplicada a través d'Internet per als hispanoparlants.

En conclusió, tot i que les IBC a través d'Internet semblen ser una solució útil i eficient, la investigació incipient està explorant la viabilitat i acceptabilitat de la iTCBA en una població general espanyola (Campos et al., 2020) i es necessita més investigació sobre el seu eficàcia en un context de malalties mediques cròniques.

2. Objectius

Atés que les IBC a través d’Internet han començat a acumular evidència empírica per al tractament de malalties mèdiques cròniques, és necessari realitzar més estudis per demostrar la seua eficàcia en població espanyola.

L'estudi actual pretén explorar l'eficàcia de la iTCBA (Campos et al., 2020) per millorar la qualitat de vida i el benestar en una població amb malaltia mèdica crònica, en comparació amb la llista d'espera (LE) com a condició de control.

Els objectius concrets d’aquest estudi són:

1. Analitzar l'eficàcia del programa iTCBA en l'augment de la qualitat de vida i el benestar als 3 mesos després de la línia de base en comparació amb el grup LE;
2. Analitzar l'eficàcia de la intervenció de la IABCT en la millora d’altres resultats secundaris com l’(auto)compassió, comportaments d'autocura, autocrítica, simptomatologia, estils d'aferrament i suport social.
3. Analitzar les dades sobre el manteniment de les millores en el grup d'intervenció i analitzar l'eficàcia de la iTCBA per al grup LE en un seguiment als 6 mesos.
4. Analitzar l'acceptabilitat del programa iTCBA en termes d'expectatives, satisfacció, usabilitat i opinió dels participants.
5. Analitzar si l'autocrítica i l’(auto)compassió mitjancen l'efecte de la condició en la millora de la qualitat de vida i el benestar al seguiment dels 3 mesos.
6. Identificar possibles facilitadors i barreres a l'ús d'aquest tipus de protocols (per exemple, lògica de tractament, durada, format, usabilitat) tenint en compte la

perspectiva del participant a través d'una entrevista qualitativa semiestructurada.

En concret, les hipòtesis d'aquest estudi són:

1. Els participants de la condició iTCBA mostraran un augment significatiu de la qualitat de vida i el benestar en el seguiment dels 3 mesos en comparació amb el grup LE.
2. Els participants del grup iTCBA mostraran augments significatius en l'(auto)compassió, comportaments d'autocura, estil segur d'aferrament i suport social; i reduccions significatives en l'autocrítica, simptomatologia i els estils d'aferrament preocupat, temorós i de menyspreu en el seguiment dels 3 mesos en comparació amb els participants de la condició LE.
3. Els augments aconseguits després de rebre la intervenció es mantindran en el seguiment dels 6 mesos per a la condició iTCBA.
4. Els participants en el grup LE mostraran una major qualitat de vida i benestar i millores en altres variables secundàries en el seguiment dels 6 mesos, una vegada que reben la iTCBA.
5. La iTCBA serà ben acceptada en termes d'expectatives, satisfacció, usabilitat i opinió per part dels participants.
6. Els canvis en l'autocrítica i l'(auto)compassió apareixeran com a mediadors dels majors canvis en la qualitat de vida i el benestar

3. Metodologia

Disseny

Es va dur a terme un assaig controlat aleatoritzat (ECA) on els participants van ser assignats aleatòriament a una de les dues condicions: a) grup d'intervenció (iTCBA), i b) grup de control (LE) i van completar diferents mesures en diferents punts d'avaluació: temps de línia de base (preavaluació), i seguiment als 3 i 6 mesos. Els participants del grup LE van rebre accés a la intervenció després de complir l'avaluació dels 3 mesos.

Població i criteris d’egilibilitat

La mostra va consistir en un mínim de 68 adults espanyols, d'entre 18 i 70 anys, que informaren d’un diagnòstic actual de malaltia mèdica crònica (per exemple, diabetis, fibromiàlgia, malaltia inflamatòria intestinal, migranyes, dolor crònic i altres malalties). Els criteris d’exclusió van ser: la presència d'una malaltia terminal; la presència de trastorns psiquiàtrics greus (esquizofrènia, dependència de substàncies, trastorn bipolar, malaltia psicòtica) o malalties neurològiques o mèdiques greus; i estar rebent tractament psicològic o formació en Mindfulness en el moment del reclutament.

La grandària de la mostra es va estimar utilitzant el programa GPower 3.1.9.7 per a Windows (Faul et al., 2007) i es va calcular una mostra de 68 participants com a mínim. Aquesta grandària es va decidir basant-se en magnituds d'efectes mitjans (d= 0.4), potència estadística de .80 i α = .05, indicant una mostra necessària de 52 participants (Brysbaert et al., 2019). Tenint en compte que la taxa d'abandonament en les intervencions basades en Internet per a les condicions mèdiques cròniques sol ser del voltant del 30%, es va establir un objectiu de 34 persones per grup com a mínim (Angeles et al., 2011; Cuijpers et al., 2008; Trompetter et al., 2015).

Procediment

Els participants van ser reclutats per diversos mitjans, incloent-hi la web de l'estudi i informació publicada a les plataformes de xarxes socials (per exemple, Facebook, Instagram, LinkedIn), les referències dels metges i a través d'associacions de pacients amb malalties cròniques. Els participants interessats contactaren amb l'equip de recerca i reberen un enllaç d'accés per omplir el consentiment informat per escrit juntament amb el qüestionari d'inici a través de la plataforma LimeSurvey (https://www.limesurvey.org/es/).

Després de donar el consentiment informat per participar en l'estudi i completar l'avaluació d'elegibilitat online, els participants que complien els criteris van ser distribuïts aleatòriament al grup iTCBA o al grup de control LE i es van registrar a la plataforma web de Psicologia i Tecnologia (https://psicologiaytecnologia.labpsitec.es/) per completar les mesures d'avaluació en diferents moments: preavaluació i seguiments de 3 i 6 mesos. Els participants en el grup d'intervenció tingueren accés al programa després d'acabar la preavaluació, mentre que els participants en el grup de control LE van haver d'esperar 3 mesos per tenir accés a la intervenció.

Un esquema d'assignació va ser creat per un investigador extern cec a l'estudi utilitzant un generador aleatori informatitzat (programari d'assignació aleatòria 2.0) a una relació 1:1. L'aleatorització es va estratificar per tipus de condició mèdica crònica (diabetis, fibromiàlgia, malaltia inflamatòria intestinal, migranes, dolor crònic de baix cost i altres malalties). No va ser possible la ceguesa per al tractament, ja que els participants i l'investigador van ser informats sobre la condició assignada.

Intervencions

Grup experimental: Teràpia online de compassió basada en l'aferrament (iTCBA).

La iTCBA és una versió *online* i autoaplicada de la Teràpia de Compassió basada en l'aferrament (TCBA) que s'ha adaptat i optimitzat per ser lliurada a través d'Internet (Campos et al., 2020). Aquesta teràpia està basada en la teoria de l'aferrament i utilitza pràctiques formes i informals de meditacions per treballar diferents aspectes relacionats amb augmentar consciència sobre el mateix estil d'aferrament així com practicar compassió per millorar relacions interpersonal i benestar en general. Aquest programa es compon de 8 mòduls que s'han formulat per ser completament autoaplicats i amb una durada estimada de 60 o 90 minuts. El contingut dels mòduls inclou textos, imatges, il·lustracions, vídeos, meditacions guiades per àudio, exercicis interactius i tasques diàries. Es va estimar que tota la intervenció es completaria en vuit setmanes.

Grup control. Grup de control llista d'espera (LE).

El grup de control no va rebre cap intervenció durant els primers tres mesos després de la inscripció a l'estudi i va completar la primera avaluació (preavaluació). No es van donar instruccions específiques per als participants que ja estaven rebent tractament mèdic per les seves condicions.

Després de completar la segona avaluació (3 mesos), els participants en aquesta condició van ser informats que tenien accés al programa iTCBA.

Mesures

Mesures principals

Qualitat de vida: Qüestionari EuroQol 5-Dimensions EQ-5D; The EuroQol Group, 1990)

Benestar: L'índex de felicitat de Pemberton (PHI; Hervás i Vázquez, 2013)

Mesures secundàries

Compassió i autocompassió: la compassió de Sussex-Oxford per a l'autoescala (SOCS-S; Gu et al., 2019)

Comportaments d'autocura: The Mindful Self-Care Scale - Versió breu (B-MSC; Hotchkiss & Cook-Cottone, 2019)

Autocrítica: L'Escala de ruminació autocrítica (SCRS; Smart et al., 2016)

Simptomatologia: L'escala de depressió, ansietat i estrès (DASS-21; Henry & Crawford, 2005)

Estils d'aferrament: El qüestionari de relacions (RQ; Bartholomew & Horowitz, 1991)

Suport social: The Medical Outcomes Study-Social Support Survey (MOS-SSS; Sherbourne & Stewart, 1991)

Qualitat de la pràctica de la meditació de compassió: El qüestionari de qualitat de la pràctica de compassió (Navarrete et al., 2021)

Altres mesures

Informació sociodemogràfica: edat, sexe, nacionalitat, nivell educatiu, ocupació i estat civil

Informació sobre la pràctica de meditació: experiència en meditació, freqüència, duració i pràctica al llarg de la vida.

Expectatives i satisfacció: Qüestionari d'expectatives i satisfacció (adaptat per Campos i col·legues (2020) de Borkovec i Nau (1972).

Usabilitat: Escala d'usabilitat del sistema (SUS; adaptada per Campos i col·legues (2020)

Opinió dels participants: Entrevista semiestructurada

Anàlisis de dades

Totes les anàlisis estadístiques van ser realitzades amb el software SPSS (v.26) per a Windows. Es van calcular proves T per a mostres independents (t), ANOVA i anàlisi de chi quadrat (χ2) per investigar les característiques del mostreig aleatoritzat i inclòs en l'ECA i per explorar les diferències de grup en la sociodemogràfica dels participants (per exemple, edat, gènere) i dades clíniques (per exemple, qualitat de vida, benestar). Les taxes d' abandonament es van calcular informant de percentatges i patrons de dades que falten.

Es van utilitzar anàlisis de models mixts d'intenció de tractar sense imputació ad hoc per gestionar les dades que falten en cas d'abandonament dels participants i per dur a terme l'anàlisi d'eficàcia (Chakraborty & Gu, 2019). La hipòtesi que la informació faltava de manera completament aleatòria (MCAR) va ser avaluada amb el Little's MCAR test. Es va implementar un model lineal d'efectes mixtos per a cada mesura de resultat mitjançant el procediment MIXED amb una intercepció aleatòria per subjecte. Per a cada resultat, el temps (inicial i seguiments de 3 i 6 mesos) es va tractar com un factor intragrupal i el grup (grup experimental i control) com a factor entre grups i es van fer un seguiment dels efectes significatius amb comparacions per parelles (ajustat per la correcció de Bonferroni). La mida de l'efecte d de Cohen i el IC del 95% es van calcular per a comparacions dins i entre grups (Cohen, 1988; Cumming & Calin-Jageman, 2017). Es van realitzar anàlisis de sensibilitat per avaluar la robustesa dels resultats en termes de diferents mètodes per manejar les dades que falten (és a dir, models mixts amb imputació i sense, estimació de màxima probabilitat i imputació múltiple de màxima probabilitat (Thabane et al., 2013). Es van analitzar les mitjanes i les desviacions estàndard de les mesures d'acceptabilitat de la intervenció.

Per explorar les variables mediadores, es van realitzar anàlisis de mediació mitjançant el procediment descrit per Hayes (2013) amb la macro PROCESS (versió 2.4), escollint el model 4

Finalment, es van explorar les respostes qualitatives dels participants pel que fa als facilitadors i les barreres a la intervenció mitjançant una anàlisi qualitativa del contingut i un enfocament de codificació i categorització de les dades mitjançant recomptes de freqüència de paraules amb el programari ATLAS.ti (v. 23).

4. Resultats

Participants i abandons

Inicialment, 276 participants estaven interessats en l'estudi i 130 van ser exclosos perquè no complien els criteris d'elegibilitat. Així, es van incloure en l'estudi un total de 146 participants i es van assignar aleatòriament a cada condició (iTCBA, n = 72; LE, n = 74). 53 d'aquests 146 participants van decidir no participar en l'estudi (24 del grup iTCBA i 29 del grup LE).

Finalment, les taxes d'abandonament al cap de 3 mesos de seguiment van suposar un 43,75% per al grup iABCT i un 42,22% per a la condició LE; i les taxes d'abandonament al cap de 6 mesos de seguiment van ser del 33,33% per al grup iABCT i del 53,85% per a la condició LE.

Diferència d'eficàcia entre les dues condicions

Canvi en les mesures primàries al seguiment dels 3 mesos.

Qualitat de vida (EQ-5D)

Va haver-hi un efecte significatiu de la interacció condició x el temps sobre la qualitat de vida general, *F* (1, 68,01) = 6,33, p = 0,014, des de la línia de base fins al seguiment de 3 mesos.

Les comparacions intragrupals van mostrar augments significatius en la qualitat de vida general i la salut general al seguiment dels 3 mesos per a la condició iTCBA, però no es va trobar cap canvi significatiu en el grup LE.

Les comparacions entre grups van revelar que els participants en la condició iTCBA van obtenir una puntuació significativament més alta en la qualitat de vida en general en el seguiment de 3 mesos en comparació al grup LE.

Benestar (PHI)

Es va trobar un efecte significatiu de la interacció condició x temps sobre el benestar total *F*(1, 60.72) = 4.69, *p* = .034, i el benestar recordat, *F*(1, 61.79) = 4.71, *p* = .034. Les comparacions intragrupals van mostrar augments significatius en el seguiment de 3 mesos en el benestar total i el benestar recordat per al grup iTCBA, però no es va trobar cap canvi significatiu en el grup LE.

La comparació entre grups no va revelar diferències en les puntuacions del PHI entre el grup iTCBA i el grup LE en el seguiment de 3 mesos, tot i que els participants de la iTCBA van obtenir una puntuació més alta que els participants de la condició LE.

Canvi en les mesures secundàries al seguiment dels 3 mesos.

Compassió i autocompassió (SOCSS)

Els resultats van mostrar un efecte d'interacció significatiu en la puntuació total del SOCSS, *F* (1, 59,95) = 4,90, p = 0,031. Les comparacions intragrupals van revelar un augment significatiu de la puntuació total SOCSS per a la condició iTCBA al seguiment de 3 mesos, però no es van trobar canvis significatius per a la condició LE.

La comparació entre grups no va revelar diferències significatives en les puntuacions SOCSS entre el grup iTCBA i el grup LE. Tanmateix, els participants de la condició iTCBA van mostrar nivells més alts de compassió en comparació amb els participants del grup LE.

Comportaments d'autocura (b-MSCS)

Els resultats no van mostrar cap efecte significatiu d'interacció condició x temps per a cap subescala del b-MSCS. Les comparacions intragrupals van revelar augments significatius en el seguiment dels 3 mesos en diferents comportaments d'autocura (autocompassió i propòsit i estructura de suport) per al grup iTCBA, però no es van trobar canvis significatius en la condició LE per a cap subescala del b-MSCS.

La comparació entre grups no va revelar diferències en les puntuacions de b-MSCS entre el grup iTCBA i el grup LE.

Autocrítica (SCRS)

Va haver-hi un efecte d'interacció significatiu en la puntuació total del SCRS, *F* (1, 61,16) = 6,76; p = 0,012. Les comparacions intragrupals van revelar una reducció significativa en la puntuació total d'autocrítica per al grup iTCBA, però no es va trobar cap reducció en el grup LE.

Respecte les comparacions entre grups, no es van revelar diferències significatives en l'autocrítica als tres mesos de seguiment entre les condicions iTCBA i LE.

Simptomatologia (DASS-21)

Els resultats no van mostrar cap efecte significatiu d'interacció condició x temps per a cap subescala del DASS-21. Les comparacions intragrupals van revelar una reducció significativa en la puntuació total del DASS-21, així com en les subescales d’ansietat, depressió i estrès per ambdós grups (iTCBA i LE) als tres mesos de seguiment.

La comparació entre grups no va revelar diferències en les puntuacions DASS-21 entre el grup iTCBA i el grup LE.

Estils d’aferrament (RQ)

Respecte als resultats sobre els estils d’aferrament, va haver-hi un efecte d'interacció significatiu en la subescala d’aferrament segur, *F* (1, 66,43) = 7,15; p = 0,009, i la subescala d’aferrament preocupat, *F* (1, 65,53) = 10,19; p = 0,002, des de la línia de base fins al seguiment dels 3 mesos.

Les comparacions dins del grup van mostrar un augment significatiu en el seguiment dels 3 mesos de l'aferrament segur i reduccions significatives de l'aferrament preocupat i l'aferrament temorós per al grup iTCBA, però no es va trobar cap canvi significatiu en el grup LE.

La comparació entre grups va revelar diferències estadísticament significatives en el seguiment de 3 mesos, on els participants del grup iTCBA va informar puntuacions més altes en aferrament segur i puntuacions més baixes en aferrament preocupat en comparació amb els participants del grup LE.

Suport social (MOSS-S)

No es va trobar cap efecte significatiu d'interacció condició x temps per a cap subescala del MOSS-S. La comparació entre grups no va revelar diferències en les puntuacions de MOSS-S entre el grup iTCBA i el grup LE l’avaluació del seguiment al cap de 3 mesos.

Eficàcia de la intervenció al seguiment dels 6 mesos

Manteniment dels canvis en el seguiment dels 6 mesos per a la condició iTCBA

Respecte als resultats en les mesures primàries, es va trobar un efecte significatiu del temps des de la línia de base fins al seguiment dels 6 mesos sobre la qualitat de vida global, *F* (2, 52,83) = 6,50, p = 0,003, i la subescala de salut general de l'EQ -5D, *F* (2, 56,41) 4,89, p = 0,011. No obstant això, no es van trobar canvis significatius per a cap subescala del PHI. Les comparacions intragrupals van revelar un augment significatiu en la qualitat de vida general i la salut general al cap de 6 mesos.

Els resultats de les mesures secundàries van revelar un efecte significatiu del temps al seguiment dels 6 mesos sobre la puntuació total de la compassió, *F* (2, 50,17) = 7,61, p = 0,001, la puntuació total de l'autocrítica, *F* (2, 51,50) = 6,04, p = 0,004, la simptomatologia global, *F* (2, 42,25) = 10,59, p < 0,001, i els estils d’aferrament preocupat, *F* (2, 54,01) = 7,35, p = 0,002], temorós *F* (2, 6) = 53,8. 7,38, p= 0,001, i de menyspreu, *F*(2, 53,91) = 3,70, p= 0,031]. Les comparacions intragrupals van mostrar augments significatius de la puntuació total de compassió i es van mostrar reduccions significatives en l'autocrítica, en totes les subescales del DASS-21 i en els estils d’aferrament preocupat, temorós i de menyspreu al seguiments dels 6 mesos.

No es va trobar cap canvi significatiu respecte al suport social.

Eficàcia de la intervenció als 6 mesos per al grup llista d'espera (LE)

Els resultats no mostren canvis significatius des de la línia de base fins al seguiment dels 6 mesos en cap de les mesures primàries (qualitat de vida i benestar) per a la condició LE.

Respecte a les mesures secundàries, els resultats mostren un efecte significatiu del temps des de la línia de base fins al seguiment dels 6 mesos per a la subescala de cura física del b-MSCS, F (2, 52,21) = 3,25, p = 0,047; i a la subescala de depressió del DASS-21, F (2, 39,96) = 7,77, p = 0,001. Les comparacions intragrupals van revelar un augment significatiu en la subescala de cura física i una reducció significativa de la simptomatologia depressiva al seguiment dels 6 mesos per al grup LE.

No es van trobar canvis significatius en el grup LE al cap de 6 mesos de seguiment per a cap altre resultat secundari.

L'autocrítica com a mediadora del benestar

En l'anàlisi dels models de mediació d'autocrítica, va haver-hi un efecte indirecte significatiu de la condició sobre el benestar mitjançant canvis en l'autocrítica, b = 0,38, SE = 0,22, IC del 95% [0,04, 0,91], ja que els intervals de confiança (IC) del 95% de bootstrap corregits per als efectes indirectes, basats en 5.000 mostres de bootstrap, no incloïen el valor zero. Ni l'efecte total, b = 0,30, t = 0,59, p = 0,560, ni l'efecte directe, b = 0,16, t = -0,15, p = 0,885, van ser significatius per a aquest model. Aquest resultat implica que l'efecte de la intervenció sobre el benestar no és directe, sinó que està mediat per canvis en l'autocrítica.

Els efectes indirectes per a la resta de models no van ser significatius, cosa que indica que el canvi en l'autocrítica i la compassió no va mediar la relació entre la condició i la qualitat de vida, i que la compassió tampoc apareix com a mediadora del benestar.

Satisfacció i usabilitat

Pel que fa als resultats sobre la satisfacció del programa, la majoria dels participants del grup iTCBA mostren una alta satisfacció amb el programa (M=26,06; SD = 5,74) després d'acabar-lo (al cap de 3 mesos). De la mateixa manera, la majoria del participants del grup LE van mostrar una alta satisfacció en general després de donar-los accés a la intervenció i finalitzar-la (al cap de 6 mesos) (M=24,14; DE = 2,19).

Els resultats de la usabilitat mostren que tant els participants de la condició iTCBA com els del grup LE van valorar el programa com a funcional i fàcil d'utilitzar en termes generals (*M* = 82,79; *SD* = 18,64; i *M* = 78,33; *SD* = 21,83, respectivament). Aquests resultats indiquen que els participants en general van tenir una experiència positiva pel que fa a la usabilitat del programa i l'acceptació de la tecnologia.

Respecte als resultats sobre les dificultats de les meditacions basades en la compassió, la majoria dels participants mostren una gran qualitat de la pràctica de la compassió referint-se a menys dificultats en diferents aspectes clau de les pràctiques de compassió com l'imaginari mental o el sentit de connexió i calidesa (M=61,65; SD = 24,34). No obstant això, els participants en la condició LE van trobar algunes dificultats pel que fa a aspectes de la pràctica de la meditació de la compassió com l'imaginari mental, el sentit de connexió i calidesa o frases i gestos compassius (M=49,71; SD =30,12).

Opinió dels participants: raons per a abandonar o no participar en una IBC i característiques per a millorar l'adherència.

Un total de 34 participants (21 del grup de no participació i 13 participants del grup d'abandonament) van completar l'entrevista semiestructurada sobre les raons per a abandonar o no participar en l'estudi.

Els anàlisis de freqüència van revelar que els motius més freqüents per no participar en l'estudi van ser la no motivació (n= 19, 90,5%), la presència de massa passos per accedir a la intervenció (n= 14, 66,7%) o no estar interessat en el programa (n= 13, 61,9%) o en la recerca científica (n= 12, 57,1%). Altres motius estaven relacionats amb la falta de presència d'un terapeuta (n=9, 42,9%), no disposar de temps suficient (n=9, 42,9%) o considerar que la part d'avaluació era massa llarga o amb massa qüestionaris (n=9). , 42,9%).

D'altra banda, els resultats mostren que els motius més freqüents d'abandonament de la intervenció van estar relacionats amb la necessitat de contacte físic amb un terapeuta (n= 12, 92,3%), la necessitat de més seguiment o suport (n= 8, 61,5%), sentir que hi havia elements de la intervenció massa exigents, cansats o repetitius (n=8, 61,5%), o sentir que la plataforma no era la que esperaven (n=7, 53,8%). Altres motius esmentats amb menys freqüència van ser que la plataforma no els agradava (n=6, 46,2%), o que el programa requeria massa temps (n=6, 46,2%).

Respecte als facilitadors, diferents mesures com augmentar la presència d'un terapeuta (79,4%), un disseny més fàcil i atractiu (73,5%), un programa més curt (55,9%) o tenir més interacció (55,9%), van ser les més freqüents esmentades per ambdós grups. Altres millores importants es van relacionar amb un programa més personalitzat i específic (32,4% i 23,5% respectivament) o amb la inclusió de funcionalitats per interactuar amb altres (32,4%).

Anàlisi qualitatiu de les opinions dels participants sobre millores i aspectes que trobaven a faltar del programa.

Els resultats de l'anàlisi temàtic es van organitzar en quatre dominis que inclouen: suport e interacció (29.75%), millores del programa (26.45%), aspectes d'avaluació i accés inicials (14.88%) i facilitadors de la plataforma i la web (28.93%). S'inclouen un total de 15 categories als dominis.

Respecte al domini relacional amb el suport, la informació va poder ser agrupada en un total de 4 categories relacionades: suport del terapeuta (47.2%), suport no especificat (30.5%), suport d'altres companys (16.67%) i suport de guies (5.56%).

Les millores nomenades dins del domini relacionat amb el programa es van agrupar en 4 categories referents a comentaris dels participants sobre diferents característiques del programa que haurien suposat alguna millora: personalització (21.88%), durada (40.63%), nivell de dificultat (18.75%) i dinamisme (18.75%).

Altres millores estigueren relacionades amb aspectes de les avaluacions inicials i l'accés. En aquest domini es van incloure tres categories que contenien comentaris sobre el desig dels participants de fer avaluacions més curtes (33,33%), un nombre reduït d'avaluacions (22,22%) i menys passos per accedir a la plataforma i començar amb la intervenció (44,44%).

Finalment, en el domini relacionat amb aspectes de la plataforma web van sorgir un total de 4 categories: web intuïtiva (28,57%), aspectes tècnics (20%), accessibilitat (11,43%) i disseny de sistemes (40%). La majoria dels desitjos dels participants esmentaven una plataforma web més atractiva i fàcil d'utilitzar.

5. Discussió i conclusions

Eficàcia del programa iTCBA al seguiment dels 3 mesos

La primera hipòtesi proposada va ser que els participants de la condició iTCBA mostrarien augments significatius de la qualitat de vida i el benestar al seguiment dels 3 mesos en comparació amb el grup LE. Aquesta hipòtesis es va confirmar parcialment ja que el grup iTCBA va augmentar significativament tant la qualitat de vida com les puntuacions de benestar i a més, es van trobar diferències significatives entre les dues condicions en el seguiment dels 3 mesos sobre la qualitat de vida global, cosa que indica que el grup iTCBA mostra puntuacions més altes en qualitat de vida que la condició LE. No obstant això, les diferències en el benestar entre les dos condicions no van ser significatives, tot i que els participants de la condició iTCBA van obtenir una puntuació més alta que els participants de la condició de LE.

La segona hipòtesi afirmava que els participants del grup iTCBA mostrarien augments significatius en (auto)compassió, comportaments d'autocura, estil d'aferrament segur i suport social; i reduccions significatives en l'autocrítica, la simptomatologia i els estils d'aferrament preocupat, temorós i de menyspreu en el seguiment dels 3 mesos en comparació amb els participants de la condició de LE. Aquesta hipòtesi es va confirmar parcialment, ja que alguns canvis significatius van seguir la direcció esperada, però no es van trobar resultats significatius en altres resultats.

Tal com es proposava en la segona hipòtesis, es van trobar augments significatius en (auto)compassió, aferrament segur i alguns comportaments d'autocura (autocompassió i próposit i estuctura de suport), i disminucions significatives en autocrítica i estils d'aferrament temorós i preocupat al seguiment dels 3 mesos per al grup iTCBA. No obstant això, alguns resultats no compleixen la segona hipòtesis degut a que les diferencies entre grups en algunes mesures no són significatives (benestar, auto (compassió), autocrítica i comportaments d’autocura) i no s’han trobat resultats significatius en les mesures de suport social o simptomatologia.

En resum, a partir dels resultats obtinguts es pot concloure que la iTCBA pot ser una intervenció eficaç per augmentar la qualitat de vida i el benestar fins als 3 mesos en individus amb malalties mèdiques cròniques. A més, la iTCBA ha demostrat la seua eficàcia per augmentar la (auto)compassió i l'aferrament segur i reduir l'autocrítica i l’aferrament preocupat i temorós fins als 3 mesos per a les persones que pateixen una malaltia crònica.

Aquests resultats estan en concordança amb resultats similars trobats en diferents revisions sistemàtiques i metaanàlisis que donen suport a l'efecte beneficiós que podria tenir una IBC en la millora de la qualitat de vida i el benestar de les persones que pateixen malalties cròniques (Austin et al. ., 2021; Hughes et al., 2021; Kiliç et al., 2021). A més, el nostre estudi reforça l'evidència existent sobre l'ús de intervencions basades en internet en el context de malalties cròniques (Bendig et al., 2018; Elbert et al., 2014; Mehta et al., 2019; White et al., 2022) i els beneficis que es podrien derivar de l'adaptació d'una IBC a un programa web lliurat a través d’Internet en aquest context (Carvalho et al., 2022; Karekla et al., 2019).

No obstant això, diferents factors s’han de tenir en compte a l’hora de considerar aquests resultats d’eficàcia:

En primer lloc, la manca de diferències estadísticament significatives entre les condicions, a més dels resultats en les magnituds de l'efecte significatius dins del grup, podria reflectir un poder estadístic insuficient per a alguns resultats (per exemple, benestar, auto (compassió) o autocrítica). Per explicar aquest problema, voldríem destacar l'efecte de la grandària de la mostra sobre les diferències estadísticament significatives. En aquest sentit, els resultats estàticament significatius amb valors p depenen directament de la grandària de les mostres, mentre que les magnituds de l'efecte són una mesura de la força d'un fenomen i no depenen directament de la grandària de la mostra (Gerber & Malhotra, 2008; Kühberger et al. ., 2014). Estudis futurs podrien confirmar si es poden trobar diferències estadístiques sobre aquests resultats en mostres més grans i, per tant, ajudar a la generalització de les troballes.

Per altra banda, l'ús d'un grup de control de llista d'espera també podria haver influït en els resultats sobre l'eficàcia. En aquesta línia, diferents estudis han posat de manifest la importància d'explorar resultats també per a les condicions de les llistes d'espera i com aquestes podrien influir en els efectes de les intervencions (per exemple, Cunningham et al., 2013; Furukawa et al., 2014).

Eficàcia del programa iTCBA al seguiment dels 6 mesos

La tercera hipòtesi afirmava que els augments aconseguits després de rebre la intervenció es mantindrien en el seguiment dels 6 mesos per a la condició iTCBA.

Aquesta hipòtesi es va confirmar parcialment, ja que es van mantenir algunes millores al cap dels 6 mesos de seguiment, però no es van trobar canvis significatius en altres variables. En aquest sentit, els resultats mostren que es van mantenir augments significatius de la qualitat de vida i la (auto)compassió fins al seguiment dels 6 mesos i reduccions significatives en l'autocrítica, la simptomatologia i els estils d'aferrament de menyspreu, preocupat i temorós. Tanmateix, no es van trobar resultats significatius per al benestar, les conductes d'autocura ni el suport social.

La quarta hipòtesi proposava que els participants del grup LE mostrarien augment significatiu en la qualitat de vida i benestar i una millora en altres variables secundàries en el seguiment dels 6 mesos, una vegada havien rebut la intervenció iTCBA. Els resultats d'aquest estudi no coincidiren amb el que s'esperava, ja que només es va trobar un canvi significatiu des de la línia de base fins al seguiment dels 6 mesos en la cura física i la simptomatologia de depressió, però no es van trobar millores significatives en cap altra mesura primària o secundària.

Alguns factors podrien explicar aquests resultats.

En primer lloc, els resultats poden veure's afectats per l'elevada taxa d'abandonament presentada en el seguiment dels 6 mesos (especialment per a la condició LE, que suposa un 53,85% dels participants). A més, com s'ha esmentat en apartats anteriors, el temps d'espera per a una intervenció podria influir en l'efectivitat i el desgast de la intervenció (Cunningham et al., 2013; Fukurawa et al., 2014).

En segon lloc, els canvis a llarg termini en persones amb afeccions mèdiques cròniques poden ser més difícils d'aconseguir a causa de les particularitats d'aquesta població. Per exemple, és important destacar l'impacte que les altes taxes de comorbiditat o el pas del temps i l'edat poden tenir sobre les limitacions funcionals de la vida diària d'aquests individus (Qin, 2022; Rector et al., 2020).

Per tant, explorar els factors associats a les taxes d'abandonament en els seguiments i investigar l'impacte a llarg termini de diferents característiques dels pacients amb afeccions mèdiques pot ser convenient per reforçar la robustesa dels resultats de seguiment. Així mateix, calen més evidències amb mostres més grans i investigacions sobre factors que influeixen en les taxes d'abandonament per tal de replicar i ajudar a generalitzar aquests resultats.

Satisfacció i usabilitat del programa iTCBA

La cinquena hipòtesi d'aquest estudi afirmava que el programa iTCBA seria ben acceptat en termes d'expectatives, satisfacció, usabilitat i opinió per part dels participants. Aquesta hipòtesi es confirma perquè els resultats de les mesures de satisfacció i usabilitat indiquen que, en general, els participants d'ambdues condicions estaven satisfets amb el programa després d'acabar-lo. La majoria dels participants d'ambdues condicions van trobar el programa funcional i fàcil d'utilitzar, i mostren un alt nivell de satisfacció amb la intervenció rebuda.

Aquests resultats estan d'acord amb diferents evidències recents que indiquen que els CBI es consideren una intervenció útil i satisfactòria per a persones que pateixen malalties cròniques (Austin et al., 2021; Brooker et al., 2020; Guiomar et al., 2022) i donen suport a l'evidència sobre l'acceptabilitat de les intervencions en línia en aquest context (Cuijpers et al., 2008).

Autocrítica i (auto)compassió com variables mediadores

La sisena hipòtesi proposava que els canvis en l'autocrítica i la (auto)compassió apareixerien com a mediadors dels majors canvis en la qualitat de vida i el benestar. Aquesta hipòtesi es va confirmar parcialment, ja que l'efecte de la condició sobre el benestar estava mediat pel canvi en l'autocrítica. No obstant això, no es va trobar cap efecte de mediació de l'autocrítica per a la qualitat de vida i els canvis en l'(auto)compassió no van mediar cap canvi en la qualitat de vida ni en el benestar.

Aquests resultats indiquen que les reduccions de l'autocrítica podrien mediar l'eficàcia de la iTCBA per augmentar el benestar en una població de malalties cròniques.

Aquest resultat està en concordança amb l’estudi realitzat per Sommers-Spijkerman i col·legues (2018), en el qual concloïen que la teràpia centrada en la compassió (CFT) funcionava a través de diferents mecanismes com cultivar l'autoconfiança (faceta de la compassió), reduir l'autocrítica i regular l'afecte positiu i negatiu (Sommers-Spijkerman et al., 2018). A més, els autors van plantejar la hipòtesi que si bé la compassió podria tenir un paper més important en les poblacions subclíniques, l'autocrítica podria tenir un paper més vital en les mostres clíniques. Aquesta hipòtesi està d'acord amb les nostres troballes, ja que l'autocrítica (però no l'autocompassió) sembla ser un mediador important dels canvis en el benestar en una població amb afeccions mèdiques cròniques.

Per tant, el nostre estudi afegeix conclusions prometedores sobre el mecanisme subjacent a l'eficàcia de les intervencions basades en compassió, però la investigació sobre aquest tema encara es troba en les primeres etapes i cal fer més investigacions en aquesta àrea aplicant dissenys més rigorosos per replicar aquestes troballes o explorar altres ingredients actius de les intervencions basades en compassió en diferents contextos (Kirby et al., 2017; Sommers-Spijkerman et al., 2018).

Opinió dels participants sobre el tractament rebut

Els resultats dels anàlisis quantitatius que exploren els motius per abandonar i no participar en l'iABCT van indicar que la majoria de motius esmentats per no participar-hi estaven relacionats amb el no sentir-se motivat, la presència de massa passos per accedir o no estar interessat en l’estudi o la recerca científica. No obstant això, els motius de l'abandonament van ser lleugerament diferents, ja que els participants van destacar aspectes com la necessitat de contacte físic amb un terapeuta, més seguiment o suport, i motius relacionats amb les característiques del programa.

Els facilitadors o millores esmentades pels participants estaven relacionats amb la inclusió del suport d'un terapeuta, un programa més fàcil, més curt i atractiu i amb més interacció al llarg de la intervenció.

Resultats similars es troben en l'anàlisi temàtic de l'opinió dels participants sobre les millores i aspectes trobats a faltar del programa, que va donar lloc a quatre àmbits: suport, millores del programa, aspectes d'avaluació i accés inicials i facilitadors de plataforma i web. En aquest sentit, els participants van esmentar com a importants millores relacionades amb rebre algun tipus de suport (especialment per part d'un terapeuta), i altres preferències relacionades amb el programa i la plataforma (és a dir, un programa més curt i personalitzat amb un disseny més atractiu) i les preferències pel que fa a l'accés. a la plataforma (és a dir, menys passos per accedir a la plataforma i un nombre més curt i menor d'avaluacions).

Aquests resultats estan en línia amb alguns estudis que aspectes com incloure suport humà, adaptar les intervencions segons les característiques de l'usuari o millorant les característiques del programa i la plataforma exploren podrien millorar l'adherència a intervencions *online* en persones amb problemes de salut crònics (Karekla et al., 2019). En la mateixa línia, les intervencions digitals que inclouen algun tipus de suport humà s'han associat amb més compromís (Palmqvist et al., 2007) i amb una major eficàcia i menors taxes d'abandonament (p. ex., Baumesiter et al., 2014; Richards & Richardson, 2012).

En conclusió, tot i que hi ha uns quants estudis que exploren qualitativament les opinions dels participants sobre diferents programes basats en la compassió (vegeu Austin et al., 2021, per a una revisió), l'evidència sobre aquest tema encara és escassa i cap estudi ha explorat les raons d'abandonament d'aquestes intervencions online en el context de condicions mèdiques cròniques. En aquest sentit, els estudis que exploren els motius de l'abandonament de les intervencions online basades en compassió podrien ajudar a millorar les intervencions adaptant-les a les necessitats dels participants i millorar l'adherència i prevenir altes taxes de desgast en aquest context.

Limitacions

Aquest estudi té limitacions que val la pena esmentar:

En primer lloc, hem utilitzat un disseny de control de llista d'espera en lloc d'una intervenció de control actiu. Si bé hi ha avantatgesètics en un disseny de llista d'espera perquè permet la prestació d'atenció a les persones que la necessiten alhora que permet una avaluació sense tractament, aquest disseny pot tenir alguns efectes en els resultats de les intervencions. Els estudis haurien d'explorar la influència de les condicions de les llistes d'espera en els resultats de la intervenció i prestar més atenció a les diferències en les condicions de control en futures investigacions (Fukurawa et al., 2014).

En segon lloc, no hem analitzat el cost-efectivitat de la iTCBA. Tenint en compte que aquestes malalties suposen una gran càrrega en termes de costos socioeconòmics i pressupost sanitari a nivell mundial (Centers for Disease Control & Prevention, 2009; WHO, 2019), calen estudis que analitzen la rendibilitat de les IBC per explorar si aquestes intervencions no només són efectives però també eficients per als sistemes sanitaris i la societat en general.

En tercer lloc, s'han de tenir en compte les altes taxes d'abandonament (especialment en el seguiment de 6 mesos) per interpretar els nostres resultats, ja que podrien haver afectat el poder estadístic i, per tant, la resta d'anàlisis del present estudi. Per abordar aquest problema, vam incloure l'anàlisi qualitatiu que explorava les raons de l'abandonament, que ens va donar informació sobre l'opinió dels participants sobre el tractament i les possibles maneres de reduir les taxes d'abandonament i millorar les IBC *online* en estudis futurs.

Quatre, la informació sobre la interferència de la malaltia no es va poder analitzar a causa de l'heterogeneïtat de la mostra i el nombre desequilibrat de participants per grup de tipus de malaltia crònica.

En cinquè lloc, tot i que un enfocament transdiagnòstic s'ha considerat un enfocament beneficiós per a malalties amb altes taxes de comorbiditat i aspectes comuns, aquest disseny també presenta alguns desavantatges com la dificultat per adaptar la intervenció a les necessitats específiques del diagnòstic i també hi ha el perill d'ignorar la diferència important entre els diagnòstics, que podrien ser objectius importants per a la intervenció. (Craske, 2012; Mansell et al., 2009). Per tant, investigacions futures podrien explorar les característiques dels pacients o les condicions que tenen més probabilitats de beneficiar-se de l'enfocament transdiagnòstic (Brassignton et al., 2018).

Finalment, no va ser possible una comparació entre el grup iTCBA i la condició de LE al seguiment dels 6 mesos perquè la LE es va proporcionar amb la intervenció als 3 mesos per raons ètiques. Per aquest motiu, els resultats del manteniment i la generalització en el seguiment de 6 mesos s'han de considerar amb precaució.

Línies futures

Diverses direccions futures es poden concloure a partir d’aquest treball:

En primer lloc, la inclusió d'algun tipus de suport, especialment el contacte humà amb un terapeuta, podria ajudar a millorar l'adherència a aquesta intervenció. Fins ara, s'ha demostrat que les intervencions digitals que inclouen algun tipus de suport humà s'han associat amb més implicació (Palmqvist et al., 2007) i amb una major eficàcia i menors taxes d'abandonament (p. ex., Baumesiter et al., 2014; Richards i Richardson, 2021).

En segon lloc, s'ha considerat que l'adaptació de les intervencions a les necessitats dels participants és una característica important que també podria millorar l’adherència. Tot i que hi ha molts punts en comú entre les diferents malalties, algunes característiques són més específiques i exigeixen intervencions més adaptades (Brassignton et al., 2016).

En tercer lloc, també es necessiten més investigacions per explorar com les diferents característiques de les plataformes i els programes (per exemple, intervencions i avaluacions més breus, un disseny de plataforma més atractiu o un programa més fàcil d'utilitzar) podrien afectar l'adherència a les IBC *online* en persones que pateixen malalties cròniques.

D'altra banda, aquesta tesi també ha ajudat a respondre algunes preguntes sobre els mecanismes subjacents a l'eficàcia de les IBC. No obstant això, aquests resultats són incipients i cal més investigació. En aquesta línia, es necessiten estudis addicionals per replicar les nostres troballes inicials i anteriors sobre els mecanismes subjacents a l'eficàcia de les IBC (vegeu Sommers-Spijkerman et al., 2018).

Una altra línia d'estudis futurs hauria de basar-se en investigacions que explorin la rendibilitat d'aquestes intervencions. Estudis futurs que explorin la implementació de les IBC *online* als sistemes de salut pública poden ser interessants per explorar si aquestes intervencions poden tenir un impacte en la reducció de la càrrega d'aquestes malalties en termes de costos socioeconòmics i de pressupost sanitari.

Conclusions

Aquest és el primer estudi a Espanya que analitza l'eficàcia de la teràpia *online* de compassió basada en l'aferrament per millorar la qualitat de vida i el benestar en una població de malalties mèdiques cròniques. A més, aquest treball és el primer intent d'explorar les raons per abandonar una IBC online en el context d’afeccions mèdiques cròniques i proporciona resultats prometedors sobre els mecanismes subjacents a l'eficàcia de les IBC.

Les principals conclusions sobre els objectius d'aquesta tesi es presenten en els punts següents:

- Els nostres resultats donen suport a l'ús de la teràpia online de compassió basada en l'aferrament per augmentar la qualitat de vida i el benestar en persones amb malalties mèdiques cròniques.
- El nostre estudi afegeix resultats prometedors de l'efecte de la iTCBA en altres aspectes com l'(auto)compassió, l'autocrítica i els estils d'aferrament.

- El manteniment dels canvis en la qualitat de vida, l'(auto)compassió, l'autocrítica, els estils d'aferrament i la simptomatologia mostren una tendència en la direcció esperada als 6 mesos per al grup iTCBA, però els resultats s'han de veure amb precaució a causa de les altes taxes d'abandonament.
- L'efecte de la intervenció sobre la condició de LE no es va poder demostrar en un seguiment de 6 mesos a causa de les altes taxes d'abandonament.
- Pel que fa a les opinions dels participants sobre la intervenció, els participants mostren una alta satisfacció amb el programa i el programa va ser ben acceptat i considerat útil. Això suggereix que les tecnologies podrien ser una eina atractiva i útil en el context de les condicions mèdiques cròniques.
- L'autocrítica va ser una variable mediadora de la relació entre la condició i el benestar, indicant que l'autocrítica podria ser un mecanisme que explicava l'eficàcia dels CBI en el context de les condicions mèdiques cròniques.
- Els motius per no participar en iABCT van estar relacionats amb la manca de motivació i interès i la presència de massa passos per accedir a la intervenció.
- Les raons per abandonar l'iABCT estaven relacionades amb la necessitat de contacte físic amb un terapeuta i més seguiment o suport, i amb aspectes relacionats amb el programa (és a dir, massa exigent o cansat).
- Aspectes de suport humà, programes i avaluacions més curts i personalitzats i millora en el disseny del lloc web (per exemple, un programa més atractiu i fàcil d'utilitzar) van ser millores considerades pels participants com a facilitadors dels CBI.

En conclusió, l'iABCT és una intervenció ben acceptada que representa una forma potencialment beneficiosa de donar suport a les persones amb malalties cròniques. No obstant això, és evident que el camp i l'evidència disponible estan en la seva infància i cal una exploració més profunda tenint en compte mostres més grans, programes a mida, anàlisis de cost-efectivitat i aspectes del suport terapèutic.

6. Referències

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INTRODUCTION

INTRODUCTION

Chronic medical conditions (CMCs) have become one of the most challenging health problems not only for the individuals who suffer from them but also for society in general (Dobbie & Mellor, 2008; Golics et al., 2013). The prevalence of these diseases has been increasing in recent years, with an estimated 30% of prevalence worldwide. These high prevalence rates can translate into social, personal and individual costs in terms of morbidity and mortality (it is estimated that an average of 70% of adults worldwide die from chronic somatic diseases and their complications) (Forouzanfar et al., 2016) and in terms of socioeconomic burden and health care budgets (Centers for Disease Control & Prevention, 2009; WHO, 2019).

Given the importance of psychological factors on overall physical health, new multidisciplinary approaches to work on these aspects have been developed to improve the management of these diseases and to target psychological processes that interfere with an effective illness management (e.g. self-criticism or illness-related shame) (Bierman et al., 2021; Callebaut et al., 2017; Legido-Quigley et al., 2013).

In this sense, compassion-based interventions (CBIs) have received considerable attention as one of the approaches to improve quality of life and well-being in individuals with chronic physical conditions (Friis et al., 2016; Lathren et al., 2018; Penlington, 2019). Practising compassion and self-compassion can be a useful approach to illness management since they involve accepting suffering as an inevitable human condition and facilitate the development of a kinder and more compassionate attitude towards difficulties (Neff, 2003). This compassionate approach to illness has been found to be beneficial for coping with the stress caused by a chronic condition and for improving physical and psychological symptomatology. In addition, a compassionate attitude towards oneself may promote the implementation of healthy and self-care behaviors which, in turn, facilitates an adaptive disease management (Austin et al., 2021; Kiliç et al., 2021; Morgan et al., 2020; Sirois et al., 2015).

On the other hand, it is worth to consider a relevant aspect proposed to improve the currently available treatments and overcome some barriers that could interfere with the effectiveness of CBIs in people with chronic conditions (e.g. access, mobility, or transportation limitations): the use of the Internet-based interventions (IBIs) (Jerant et al., 2005; Karekla et al. al., 2019). Thus far, emerging evidence shows potential value of delivering a CBI online in the context of chronic illness (Finlay-Jones et al., 2020; Prentice et al., 2021). In addition, other results show that adapting CBIs to an online format can improve adherence and facilitate the involvement of chronic patients in better managing their disease (Karekla et al., 2019).

In recent years, CBIs delivered online have begun to accumulate empirical evidence, although more research is still needed, particularly in chronic medical conditions population. Therefore, the main objective of this dissertation is to analyze the efficacy of a CBI delivered online (the Internet Attachment-Based Compassion Therapy; iABCT; Campos, 2020) to improve the quality of life and well-being in a population with chronic medical conditions. Concretely, this dissertation contains three chapters.

Chapter 1 describes a theoretical background of the main topics of this dissertation, including the main characteristics and scientific literature about CBIs in the context of chronic medical conditions.

In **chapter 2** the randomized controlled trial will be presented.

Finally, **chapter 3** is aimed at describing the main findings, limitations and future lines of the experimental research study.

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CHAPTER ONE

THEORETICAL BACKGROUND

CHAPTER ONE. Theoretical background

1. Chronic medical conditions (CMCs): definitions and classifications

When trying to define chronic diseases a significant debate is generated due to the great number of definitions available from different areas such as the academic literature, public health policies or national and international health institutions reports. This diversity is mainly explained by the differences found on many dimensions of chronic conditions (e.g. differences in the rapidity of onset, duration and course of the disease, degrees of ambiguity in symptom presentation, severity of daily life disruption and functional limitations, level of life threat, or need for medical attention) (Petrie & Revenson 2005; Stanton et al., 2007; Goodman et al., 2013). As a consequence, different definitions and classifications of chronic conditions appear to attend to this variability (Bernell & Howard, 2016).

In terms of classifications of chronic conditions, various types of diseases are considered chronic attending to differences on the transmission of the disease or the consideration of mental disorders in their classification. For instance, the US Centers for Disease Control (CDC) classification would include heart disease, stroke, cancer, type 2 diabetes, obesity, and arthritis (CDC, 2016), and the classification of the US Centers for Medicare and Medicaid Services, would also include, Alzheimer's disease, depression, or HIV, among others (Chronic Condition Data Warehouse, 2019). On the other hand, the World Health Organization (WHO, 2013) define chronic conditions as non-communicable diseases, which would exclude from their classification viral diseases such as HIV. The WHO classifications would include the following types: cardiovascular diseases (like heart attacks and stroke), cancers, chronic respiratory diseases (such as chronic obstructive pulmonary disease and asthma) and diabetes (WHO, 2016).

Another cause of the variability in the definitions of chronic conditions is the duration of the disease. Even though the majority of studies point out to a duration of one year or more to consider a disease as chronic (e.g. Warshaw, 2006; US Department of Health and Human Services, 2010; Anderson, 2010), other studies mention a duration of three months or more (e.g. the U.S. National Center for Health and Statistics, 2011), and others do not specify the duration by using terms such as “permanent” (e.g. Bernstein et al., 2003) or long duration (e.g. WHO, 2011).

This variability in terminology could have negative implications regarding the healthcare policies aimed at reducing the burden and social and personal costs of chronic conditions. For instance, it could make it more difficult to define interventions or give recommendations, it could affect research and practice, or it could even suppose a confusion to those who are suffering from chronic conditions and need to understand their disease in order to manage them (Bernell & Howard, 2016; Goodman et al., 2013). For that reason, it is essential to reach a detailed and precise definition in order to reduce chronic disease burden for the individual and society. In this regard, finding some commonalities among these definitions could help to clarify what constitutes a chronic disease and to better understand their impact and improve recommendations for their intervention (Bernell & Howard, 2016; Goodman et al., 2013).

In this line, the Australian Institute for Health and Welfare points out the following characteristics that commonly present chronic diseases: “complex causality, with multiple factors leading to their onset; a long development period, for which there may be no symptoms; a prolonged course of illness, perhaps leading to other health complications; and associated functional impairment or disability” (Australian Institute of Health and Welfare, 2016).

This dissertation will rely on a definition based on commonalities from different definitions and will consider the following key elements:

- Chronic conditions will be considered as non-communicable and longstanding physical alterations, thereby excluding from this definition viral diseases such as HIV (e.g. WHO, 2011) and psychiatric conditions and mental disorders (e.g. Megari, 2013);
- Chronic conditions would require ongoing treatment or cause several impairments in the patient's daily life (e.g. Hwang et al, 2001; Warshaw, 2006) but they do not suppose a severe life threat, excluding diseases like cancer (e.g. Godmaan et al., 2013).

Thus, we will use the term Chronic Medical Conditions (CMCs) to refer to longstanding physical alterations that require ongoing treatment or suppose significant functional restrictions. These conditions are considered non-communicable diseases (NCDs) and can lead to severe consequences such as hospitalization, long-term disability or a diminished quality of life (Buttorf, et al., 2017; Centers for Disease Control & Prevention, 2002; WHO, 2013).

1.1. Prevalence and personal and socioeconomical costs.

As a consequence of the variability on the definitions mentioned above, prevalence numbers are many times inconclusive. Moreover, many prevalence studies are focused on specific chronic illnesses but general population studies to determine the overall prevalence of chronic conditions are less common (Dobbie & Mellor, 2008).

However, a great rise in prevalence of these conditions have been estimated due to significant changes in demographics and lifestyle (e.g. increasing aging population) and other social and environmental factors (Maresova et al., 2019; WHO, 2011). It is estimated that 30% of people live with one or more chronic physical illnesses (Hajat & Stein, 2018). Specifically, results in the US indicates that six in ten adults have a chronic disease, and four in ten adults have two or more, accounting for 86% of all medical costs and being even greater worldwide (CDC, 2022; Van Dyke, 2016).

In Spain, according to the European Health Survey Spain 2020 (EESE-2020), a 59.1% of women and a 49.3% of men aged 15 and over, present some perceived chronic illness or health problem, and these percentages increase with increasing age, being higher in women for all age groups. These chronic health problems suffered by people over 15 years old are different for men and women. The most frequent for women are osteoarthritis (excluding arthritis) (19.7%), high blood pressure (19.1%) and chronic low-back pain (17.1%). And for men, high blood pressure (19.0%), high cholesterol (15.5%) and chronic low-back pain (10.1%) (Spanish National Institute of Statistics, 2020)

These high prevalence numbers could be translated into social, personal and individual costs. In terms of mortality and disability, it is estimated that and average of 70% of adults globally die from chronic somatic disease and their complications (Forouzanfar et al., 2016). Specifically, four of these conditions (cardiovascular disease, cancer, chronic lung conditions and diabetes) account for three in five deaths worldwide, becoming the leading cause of mortality and disability globally (Wang et al., 2016).

Furthermore, individuals suffer from CMCs for long periods of time, which suppose a significant impact on their lives and their relatives and a great rise in health-care expenses, imposing a significant economic burden (WHO, 2019).

In terms of health-care burden and costs, many studies show that chronic conditions are associated with an increase in healthcare expenditures such as the utilization of hospital care, the use of more prescription medications, or the use of more emergency department services (McPhail, 2016; Vogeli et al., 2007). Moreover, the likehood of using these resources increases with the presence of comorbidities, increasing the costs with each subsequent condition (Braunstein et al., 2003; Gijsen et al., 2001).

On the other hand, the effect of CMCs on people who suffer from them is variable. Living with a CMC may suppose a life threat, a threat to independence and autonomy, a threat to their future plans or goals and a threat to their relationships and economic well-being (Falvo et al., 2018). Individuals suffering from CMCs are usually required to cope with on-going self-management challenges including coping with on-going symptoms, adhering to new treatment plans or learning healthy behaviors (Falvo et a., 2018; Petrie & Revenson, 2005).

In conclusion, these conditions account for an important percentage of mortality and morbidity worldwide and suppose a great burden in terms of socioeconomic costs and health-care budget, which make from these diseases one of the most important health challenges of the 21st century (Centers for Disease Control & Prevention, 2009; WHO, 2019).

1.2. Comorbidity: the importance of the psychological factors

Along with the important consequences mentioned above, another aspect that makes these diseases a significant problem to consider is their high rates of comorbidity. These comorbidities have been extensively reviewed in two directions: comorbidity among the different chronic conditions (multicomorbidity) (Hajat & Stein, 2018); and comorbidity between mental health problems and chronic medical conditions (Conversano, 2019; Daré et al., 2019).

Multicomorbidity could be defined as the presence of two or more chronic diseases and it is estimated that one in three all adults suffer from multiple chronic conditions (MCC) worldwide (Hajat & Stein, 2018). Different studies have related MCC with substantially greater increases in healthcare costs and different patterns of resource utilization in comparison with people with a single chronic disease or with no chronic diseases (Rijken et al., 2005). Moreover, the presence of multiple chronic diseases has also been associated with multimorbidity, which in turn has been associated with poor functional status (Kadam et al., 2007), poor quality of life (Fortin et al., 2006; Rijken et al 2005) and more psychological distress (Fortin et al., 2006; Hopman & Rijken, 2015).

Regarding comorbidity between chronic conditions and mental health problems, studies have shown that individuals with chronic medical illnesses have higher rates of anxiety and depression compared to the general population (Clarke & Currie 2009; National Institute for Health and Care Excellence et al., 2009) and present negative health outcomes such as low satisfaction with life (Strine et al., 2008) or a diminished quality of life (Tóthová et al., 2014).

Numerous studies have shown that anxiety and depression are commonly experienced by individuals with different chronic medical conditions such as chronic pain (Breivik et al., 2006), inflammatory bowel disease (Viganò et al., 2018), obstructive pulmonary disease (Ng et al., 2007), asthma (Walters et al., 2011), cardiovascular illness (Jünger et al., 2005; Katon, 2003) and diabetes (De Ornelas et al., 2012; Katon et al., 2004).

Specifically, different conditions such as thyroid disease, respiratory disease, arthritis, gastrointestinal disease, migraines and allergic conditions have been associated with anxiety disorders, leading to a greater disability and a poor quality of life (Sareen et al., 2006).

Similar results are found when it comes to the comorbidity between depression and chronic physical conditions. For instance, results from a study in Spain, concluded that individuals with chronic physical conditions were twice likely to suffer 12-month major depressive disorder, being the strongest association between depression and respiratory disorders. Moreover, their results showed that this comorbidity increased notably the odds of disability among patients with chronic physical conditions (Gabilondo et al., 2012). In the same line, another study showed that the lifetime prevalence of depression in those with multiple chronic physical illnesses is seven times higher compared to those who have none (Moussavi et al., 2007).

The presence of comorbidity has different implications regarding illness course, prognosis, and severity as well as adjustment to illness (DiMatteo et al., 2000; Felker et al., 2010). For instance, studies have shown that the presence of psychopathology has been related with negative consequences such as reduced treatment engagement (Bokma et al., 2017; Crawshaw et al., 2016), increased symptom severity (Koloski et al., 2012; Mikocka-Walus et al., 2016), and morbidity and mortality (de Groot et al., 2001; Park et al., 2013). In the same line, the psychological adjustment process to the disease, the coping strategies to face stress associated with the disease, and the patient’s illness management also have a direct influence on physical health, including morbidity, mortality and disease complications (Evers et al., 2014, Figueiras & Neto, 2019; Tuccero et al., 2016; Vancampfort et al., 2017).

The evidence of these comorbidities and their consequences have driven the attention to the role that psychological factors could play on the course and prognosis of the disease and how in turn, this could impact on global health.

Thereby, the interest about the role of psychological factors on the physical conditions has increased in the last decades and different psychological processes have been considered important in adaptive illness management. Living with a chronic medical condition suppose life change which requires a great adaptation from the individual in terms of managing the symptoms, treatment, physical and psychological consequences (Barlow et al., 2002). In order to better adjust and manage their condition, individuals would have to initiate and maintain self-care behaviors such as physical activity and other health-related behaviors, treatment adherence or coping with unpleasant emotional responses caused by their disease and its consequences (Chahardah-Cherik et al., 2018; de Ridder et al., 2008).

At the same time, detrimental psychological processes that could appear along with these conditions (e.g., illness-related shame, self-criticism or rumination) and the experience of unpleasant emotions suppose a barrier to implement self-care behaviors involved in an adaptive illness management (e.g., treatment plan adherence, exercising, or dietary guidelines adherence), which, in turn, could further increase distress, worsen prognosis and detriment the quality of life (Callebaut et al., 2017; Dammers, 2020; Soo et al., 2009; Trindade et al., 2018).

As a consequence, it is crucial that interventions aimed at improving quality if life of individuals suffering from CMCs incorporate as targets psychological factors mentioned above, including self-care behaviors involved in the illness management or strategies to cope with detrimental psychological processes (Conversano & Di Giuseppe, 2021; Semenchuk, 2022).

2. Evidence-based psychological treatments for CMCs

Given the important role that psychological factors play on chronic medical conditions, interventions aimed at improving mental well-being are considered crucial to improve general physical health. As a consequence, clinical guidelines agree in recommending multidisciplinary approaches that follow a biopsychosocial model (including medical, psychological and social aspects) for the treatment of CMCs (Bierman et al., 2021; Legido-Quigley et al., 2013).

Research on the effectiveness of psychological interventions for the treatment of individuals with CMCs have been growing over the last decade and have been mainly focused on improving the self-adjustment to illness and promoting a more active approach to daily management of the consequences of the disease; on reducing physiological symptomatology caused by the condition; and on supporting treatment-resistant patients on coping with the medical intervention (Anderson & Ozakinci, 2018; Petrie & Revenson, 2005).

For this purposes, most researched psychological interventions for individuals with chronic medical conditions are based on the cognitive behavioral therapy (CBT) approach and self-management of illness programs (Audulv et al., 2012; Hoffman et al., 2012).

2.1. CBT approach and its effectiveness in CMCs

The aim of CBT consists of establishing a change of pattern by working directly on the interaction between thoughts, emotions and physical sensations. These changes seek to break with maladaptive patterns and replace them with other more adaptive responses by influencing on one of the elements of the interaction (Sage et al., 2013). In working with people with chronic conditions, the role that physical sensations play in the interaction may be more pronounced since they may provide information about current bodily state for people with life-changing illness (Sage et al., 2013; White, 2001).

CBT is an organized and time-limited approach (Ghasemzadeh, 2001) that can get the patient and therapist actively involved (Sharif et al., 2014). The content of CBT-based programs for individuals with CMCs usually include psychoeducation, behavioral activation, cognitive restructuring, relapse prevention and homework assignments to work with mental comorbid symptomatology like depressive or anxiety symptoms (Li et al., 2017; Sage et al., 2013).

Regarding CBT effectiveness in people with CMCs, Hofmann and colleagues (2012) showed in an extensive review and meta-analysis, that psychological interventions particularly based on CBT are an effective treatment for psychological distress, depression and anxiety symptoms in patients with different CMCs. Specifically, various meta-analysis exploring the effectiveness of CBT approach showed significant results on reducing levels of anxiety and depression, and relieving fatigue symptoms in rheumatoid arthritis patients (Shen et al., 2020); on improving depressive and anxiety symptomatology, quality of life and fasting glucose in individuals with diabetes (Li et al., 2017); or on reducing psychological distress in patients with Multiple sclerosis and Parkinson (Ghielen et al., 2019).

2.2. Illness self-management programs and their effectiveness

Another approach that has gained much attention among researchers in the field of chronic medical conditions is the illness self-management paradigm (Grady & Gough, 2014). Illness self-management refers to the individual's ability to manage their disease and its consequences and to adapt to lifestyle changes that may arise due to the disease itself. This means that effective illness self-management would entail having adequate management of the symptoms, treatment, and physical and psychological consequences of the disease that are necessary to ultimately maintain a good quality of life (Barlow et al., 2002).

In this line, self-management programs have been mainly aimed at promoting self-management skills, which include enhancing self-care behaviors or health-related behaviors that facilitate individuals to deal with the disease and daily associated challenges (Bodenheimer et al., 2002; Lederle & Bitzer, 2019). In this sense, the content of these interventions usually involves promoting healthy eating and exercise habits; learning an appropriate use of medications and making good decisions about their health; learning techniques to manage comorbid symptomatology like depression and techniques to deal with problems such as frustration, fatigue, pain, and isolation; or learning how to effectively communicate with family, friends, and health professionals (see Chronic Disease Self-Management Program -CDSMP-, Lorig et al., 2001).

A great amount of evidence from systematic reviews and meta-analyses show the effectiveness of self-management interventions in patients with different chronic conditions, such as arthritis (Du et al., 2011), asthma (Gibson et al., 2003), chronic heart failure (CHF) (Dietwig, et al., 2010) chronic obstructive pulmonary disease (COPD) (Zwerink et al., 2014), and type 2 diabetes mellitus (T2DM) (Deakin et al., 2005). Specifically, results from different studies point to effectiveness of self-management programs on improving biomarkers and physical health (e.g. pain and disability) outcomes in individuals with musculoskeletal pain (Elbers et al 2018); on reducing levels of hemoglobin and fasting plasma glucose in patients with diabetes (Jaipakdee et al., 2015); and on reducing levels of urinary protein excretion, blood pressure and C-reactive Protein (CRP) in patients with chronic kidney disease (Peng et al., 2019).

Other findings of the self-management interventions effectiveness are shown in positive health outcomes such as improving the quality of life in people with COPD (Yang et al., 2018), asthma (Hodkinson et al., 2020), diabetes (Jaipakdee et al., 2015) and heart failure (Jonkman et al., 2016).

Lastly, results in better healthcare system utilizations are also found such as reductions in hospital admissions and emergency department visits among COPD patients receiving self-management education (Yang et al., 2018), reductions of the use of healthcare resources among patients with asthma (Hodkinson et al., 2020) or beneficial effect of a self-management program in heart failure-related hospitalizations (Jonkman et al., 2016).

2.3. Limitations of these approaches

Although psychological interventions for treating patients with chronic medical conditions have been proven to be effective, these approaches are not exempted of limitations. For instance, the majority of the studies are focused on one specific chronic illness (e.g. diabetes, chronic pain, etc.) not taking into account the high rates of comorbidity that exist among these conditions (i.e. over 50% of people have more than one chronic condition) (Barnett et al.,2012; Trento et al., 2012). In relation to this, inconclusive results and discrepancies have been found due to the great variability among the approaches targeting different CMCs and it has become very difficult to conclude which are the active ingredients that explain the effectiveness of interventions in this context (Brassignton et al., 2016; Jonkman et al., 2016). Moreover, problems in disseminating the interventions also appear as a consequence of this variability, since therapists are required to be trained in many protocols according to a specific illness or condition (Brassignton et al., 2016; Taylor & Clark, 2009).

In this sense, it is recommended to research on how multiple chronic conditions interact and co-occur to better understand the burden and develop a more realistic and adapted approach to these conditions (Brasington 2016; Krause et al., 2006). Similarly, interventions focused on commonalities among the different chronic conditions facilitates treatment of people with comorbidity, reduce the costs associated with training mental professionals and facilitate dissemination (Barlow et al., 2016; Brown et al., 2001; Osma et al., 2021).

In the following sections, we will focus on the need to continue to work towards innovating psychological treatments in the context of chronic medical conditions, while also overcoming these limitations. We will review new therapeutic approaches such as compassion approach and the use of the Internet as an innovative tool to improve the dissemination of evidence-based treatments.

3. Compassion approach for CMCs

As mentioned in previous sections, being diagnosed with a CMC can bring a variety of adaptive challenges such as dealing with the disease symptoms, adhering to medication or learning and developing health-related behaviors that help individuals to manage their condition (Dekker & de Groot, 2018). In many cases, suffering from a CMC suppose a life stressor and requires individuals to learn how to cope and manage their condition and it consequences and accept and integrate it as a part of their new reality (Ambrosio et al., 2015). Moreover, this ongoing illness managing and long-term effort to cope with daily life stressors could lead to an important loss of energy and depressive or anxiety symptomatology (Clarke & Currie, 2009; Katon & Ciechanowski, 2002; Patten, 2001). In response to these challenges, many individuals suffering from CMCs report blaming themselves or being self-critical for their perceived role in causing or exacerbating their disease, which ends up complicating the adjustment and diminishing their quality of life and well-being (Callebaut et al., 2017; Dammers, 2020).

In this context, changing how individuals approach to their illness and interventions to help patients to cope with detrimental psychological processes such as self-criticism or self-blame, have been gaining attention for patients with CMCs. This is the case of interventions aimed at developing compassion or compassion-based interventions (CBIs) (Carvalho et al., 2022; Morgan et al., 2020; Sirois et al., 2015).

Compassion supposes an alternative way to approach to the disease, since it helps individuals to provide comfort and self-kindness to themselves during their unpleasant emotional reactions to their illness, instead of being self-critical or blaming themselves (Neff, 2010). In turn, this new approach supposes a very useful resource to promote health-related behaviors that lead to a better adjustment to the disease and a better quality of life (Semenchuk et al., 2022).

3.1. Compassion: definition and related constructs

Compassion is a concept that has been discussed for a long time from religious and spiritual approaches but it has been gaining attention noticeably from the scientific research over the last 20 years. In this context, there is a consensus in considering compassion as a concept that involves one person who is suffering and other who is motivated to help them (Gilbert, 2009; Goetz et al., 2010; Lazarus, 1991). For instance, in a broad systematic review on compassion, Goetz and colleagues (2010) defined compassion as “the feeling that arises in witnessing another’s suffering and that motivates a subsequent desire to help”.

Paul Gilbert, one of the most acknowledged experts in the study of compassion, conceptualizes it within an evolutionary framework, arguing that compassion is an evolved motivational system designed to regulate negative affect and has originated from the same capacities that primates had to form attachment bonds and engage in affiliative and cooperative behaviors for group survival (Gilbert, 2005). He defined compassion as the recognition of suffering and the inclination to relieve it with an act of kindness rather than criticizing, blaming, or pitying. Following this definition, compassion not only would include the awareness of suffering and the motivation for help, but also the ability to non-judging the others and to tolerate one's own distress caused by the other's suffering (Gilbert, 2009).

In the same line, Kanov and colleagues (2004), state that compassion consists of three facets: '*noticing*', which refers to the awareness and recognition of the other's suffering; '*feeling'*, related to the sensitivity to respond emotionally and an empathic reaction to the suffering; and '*responding',* which involves the desire to act in order to alleviate the person's suffering.

In conclusion, these definitions imply that compassion is multidimensional construct consisting in affective elements (i.e. sensitivity and feeling touch by a person's suffering), cognitive elements (i.e. the ability to be aware and to recognize other's suffering) and behavioral elements (i.e. motivation and wanting to act to help the others).

Along with finding a consensus for the definition and components of compassion, it has been necessary to distinguish this concept from others similar. In this sense, due to their similarities, compassion has been commonly related to terms like empathy, altruism or pity (Goetz et al., 2010; Goetz & Simon-Thomas, 2017). For instance, it is not unusual to find the definition of compassion along with a mention to empathy (e.g. Kanov et al., 2004). In fact, empathy refers to a multidimensional concept involving two components: affective and cognitive empathy (Davis, 1983). In this respect, affective empathy, which refers to affectively react and share other's people's emotions, it has been considered as an essential component of compassion (Gilbert, 2010; Kanov et al., 2004). Nevertheless, in an empathetic reaction different types of the other's emotion could be syntonized (e.g. anger, joy, sadness…) while a compassionate response would refer to a specific reaction to suffering (Goetz & Simon-Thomas, 2017). Moreover, we can also find the distinction between the two terms in regards to the motivational component of compassion, since the desire and the action to alleviate suffering is not a necessary element of empathy (Strauss et al., 2016).

Similarly, this motivational component of compassion is also an element that helps us to distinguish this concept from pity. Moreover, in contrast to compassion, pity would entail some kind of condescending response towards the other's suffering or even seeing the other as unworthy of help (Cassell, 2002; Lazarus, 1991).

Another term that has been differentiated from compassion is altruism. While compassion elicits behaviors oriented to helping the others and caregiving behaviors, altruistic acts can have a broad range of motivations not necessarily focused on alleviating suffering (for example, reducing one's own guilt or satisfying a sense of obligation) (Smith et al., 2013). In fact, many altruistic behaviors are not originated as a response to the other's suffering or need (Goetz & Simon-Thomas, 2017).

In this context, it is worth mentioning the term self-compassion, which has been indistinctly used for compassion according to some authors (e.g. López et al., 2017). In this regard, Kirstin Neff (2003) defined compassion for others within a model of self-compassion, arguing that self-compassion would be a form of compassion directed towards oneself. She states that self-compassion consists on the following three elements and their opposites: *kindness vs. self-judgment,* refers to being kind and understanding towards oneself instead of self-critical and judgmental; *common humanity vs. isolation*, which entails considering suffering as a part of the human experience as an opposite of experiencing it in isolation; and *mindfulness vs. overidentification,* that consist of the capacity of tolerating suffering with mindful awareness separating your identity from the experienced problem rather than over-identifying with it (Neff, 2003).

To sum up, considering the variety of definitions and related constructs, Strauss and colleagues (2016) concluded in their systematic review that compassion is a cognitive, affective, and behavioral process consisting of five elements that refer to both self- and other-compassion (Strauss et al., 2016):

1. Recognizing suffering;
2. Understanding the universality of suffering in human experience;
3. Feeling empathy for the person suffering and connecting with the distress (emotional resonance);
4. Tolerating uncomfortable feelings aroused in response to the suffering person (e.g. distress, anger, fear) so remaining open to and accepting of the person suffering; and
5. Motivation to act to alleviate suffering

3.2. Compassion-based interventions (CBIs)

Along with the development of the scientific study of compassion and their reported benefits, interest in applying compassion in the field of psychotherapy has been growing with positive results (Kirby et al., 2017). In this context, compassion-based interventions (CBIs) were developed with the specific aim of cultivating compassionate states and different authors have identified six currently empirically supported CBIs based on promoting compassion (Garcia-Campayo et al., 2016; Kirby et al., 2017).

In the following paragraphs, the main elements of each of these interventions will be briefly described:

- *Compassion-Focused Therapy (CFT; Gilbert, 2014):* CFT has its roots in different theoretical approaches such as evolutionary psychology, attachment theory, Buddhist psychology and social mentality theory (Gilbert, 2014). In contrast to other CBIs, the CFT is a psychotherapeutic approach that was developed to treat people with chronic and complex mental health problems linked to high levels of shame and self-criticism. These problems are considered transdiagnostic and people who experience them may struggle to feel relieved, reassured or safe (Gilbert & Proctor, 2006). In this sense, the aim of CFT is to promote compassion and self-compassion to help people develop and work with experiences of inner warmth, safeness and soothing and with the final result of reducing their high levels of shame and self-criticism (Gilbert, 2009). CFT is an integrated and multimodal approach grounded in a neurophysiological theoretical assumption that we have three affect regulation systems (threat, drive and soothing systems) that co-regulate each other and have evolved along with the attachment systems. These systems can become unbalanced, and rebalancing them is one of the goals of therapy (Gilbert, 2009). It is hypothesized that people with high levels of self-criticism and shame are dominated by the "threat system" and that it is the soothing system the one that helps them to generate an alternative way to relate to their inner experiences by promoting feelings of reassurance, safeness and well-being. To enhance the soothing system and regulate the others, CFT aims at promoting compassion using different techniques including self-compassionate meditation, imagery, letter writing and dialogic role-play (Gilbert, 2009).

- *Mindful Self-Compassion (MSC; Neff & Germer, 2013):* MSC is a program that combines mindfulness and self-compassion skills in order to enhance our emotional well-being in both the general public and to some clinical populations. The main focus of MSC program is helping participants to develop self-compassion and provide them with tools to integrate it to deal with daily life situations or difficult times. As mentioned in the previous section, the author defines self-compassion as composed of three elements: self-kindness, common humanity and mindfulness (Neff, 2003). Both self-compassion and mindfulness are complementary processes that help individuals to create a state of warmhearted and connected presence during one's life difficulties. Mindfulness skills help us to become more aware and be more open to suffering and self-compassion skills allow us to relate with the suffering with kindness (Neff & Germer, 2013). MSC is an 8-week group course consistent in once a week meetings and a half-day meditation retreat. The program consists of formal and informal self-compassion meditations, experiential exercises and discussion periods during the course sessions and homework assignments (Germer & Neff, 2013; Neff & Germer, 2013).
- *Compassion Cultivation Training (CCT; Jazaieri et al., 2012):* The compassion cultivation training (CCT), was developed by a multidisciplinary group of researchers at Stanford University and the Center for Compassion and Altruism Research and Education (CCARE) with a clear influence from Tibetan Buddhist contemplative practices (Jinpa, 2010). The main goal of the program is to enhance compassion in both professional and personal settings. Compassion is conceptualized as a multidimensional state comprised of four components: cognitive/attentional, affective, intentional and motivational (Goldin & Jazaieri, 2017). The program is structured in eight weekly sessions

accompanied by daily compassion-meditation practice. The classes consist of pedagogical instruction along with a group discussion, a guided group meditation, interactive practical exercises and exercises designed to connect to others with open-heartedness. Moreover, participants are encouraged and instructed to practice both formal and informal meditations at home for at least 15 minutes daily (Jazaieri et al., 2012).

- *Cognitively-Based Compassion Training (CBCT; Negi, 2005)*: The CBCT is a mindfulness and compassion training aimed at increasing social competence and reducing emotional reactivity and personal stress. In the CBCT framework, compassion is understood as a motivational state based on two components: affection for others (affective component) and the awareness of others' distress (cognitive component) (Ash et al., 2021). Thus, compassion is defined as the warmhearted wish to see others free from suffering (Negi, 2005), a definition influenced by research in affective neuroscience and the Indo-Tibetan Buddhist tradition (Jinpa et al., 2014). Participants in CBCT are trained in psychosocial skills that are expected to strengthen compassionate motivations which may prompt compassionate behavior. After different revisions, the CBCT protocol includes a foundational practice followed by six modules developed in a 10 weeks course. CBCT sessions include pedagogical explanations and group discussions, guided meditations, interactive exercises and guided meditation recordings for daily meditations at home. The CBCT learning process utilizes two meditation strategies (stabilizing meditation and analytical meditation) to promote the development of skills across three levels: content knowledge, personal insight, and embodied understanding (Ash et al., 2021).

- **Cultivating Emotional Balance (CEB; Kemeny et al., 2012):** The CEB is an evidenced-based Mindfulness and Compassion-Based Intervention (MCBI) aim at reducing reduce negative emotional experiences toward oneself and others and helping to develop skills for constructively express emotions (Kemeny et al., 2012; Sansó et al., 2017). In contrast with the others CBIs, the CEB has been conceptualized as an emotion regulation training intervention. It consists of an eight-week intensive training that integrates aspects from ancient Eastern contemplative practices along with Western scientific study of emotion regulation. Thus, the training includes two components: the meditation component, consisting of different meditation practices (concentrative, deconstructive and constructive) aimed at training emotional attention, experiential examinations of physical presence, feelings and mental processes and promoting empathy or compassion (Lutz et al., 2015; Zanesco et al., 2016); and the emotion regulation component that includes education on understanding emotions and emotion triggers, and emotional experiences and consequences (Ekman, 2007). The techniques used in the CEB include didactic presentations, group and pair discussions, guided meditations and emotion regulation strategies that help the participant to understand the relationship between emotion and cognition, recognize the expression and experience of emotions and understand their own emotional patterns (Lama & Ekman, 2008; Kemeny et al., 2011).

- **Attachment- Based Compassion Therapy; ABCT (García-Campayo & Demarzo, 2015):** The ABCT protocol was developed in Spain due to a need to adapt CBIs to cultural differences (large differences between healthcare systems) and because most of the existing protocols are not aimed at treating clinical populations (Garcia-Campayo et al., 2016). This therapy is based on attachment theory (Fearon & Roisman, 2017) which provides a framework for understanding the links between close relationships and psychopathology and includes specific practices to identify and develop a secure attachment style to promote compassion for oneself and others (Garcia-Campayo et al., 2016). Thus, the ABCT includes both practices to raise awareness and/or address maladaptive aspects (when appropriate) of attachment styles developed with parents and compassion and self-compassion practices to improve interpersonal relationships and general well-being (Garcia-Campayo et al., 2016). This intervention is composed of 8 modules that are estimated to be delivered in 8 weeks and contain theoretical explanations, formal and informal meditation practices and daily homework assignments to integrate compassion into their daily life. Formal and informal compassion and self-compassion meditations include receiving and giving compassion to oneself, friends, unknown people, and people deemed to be problematic; identifying their own attachment style; and understanding how it influences their current interpersonal relationships, are practiced during the intervention. This CBI will be explained in more detail in Chapter 2.

3.3. Effectiveness of CBIs on different outcomes

Over the last decades, a great number of studies have pointed at the benefits of (self)compassion on both improving mental and physical health and reducing psychopathology (e.g. Bluth & Neff, 2018; Kirby et al., 2017; Neff et al., 2007). For example, results from various meta-analysis analyzing the effectiveness of different CBIs and interventions that cultivate compassion indicate positive associations between compassion and emotion regulation and mental health (MacBeth & Gumley, 2012), and associations between self-compassion trait and higher levels of well-being (Galante et al., 2014; Zessin et al., 2015) and self-esteem (Thomason & Mogdaddam, 2021). In this sense, a review of results of different compassion-based interventions were analyzed in another meta-analysis developed by Kirby and colleagues (2017) indicating a significant moderate effect size in improving compassion (d = 0.55), self-compassion (d = 0.70); mindfulness (d = 0.54), and well-being (d = 0.51).

Other studies showed benefits of training compassion and self-compassion in enhancing quality of life (Wei et al., 2011), psychological and physiological functioning, and interpersonal relationships (Arch et al., 2016; Neff et al., 2007). Similarly, cultivating compassion has also been associated with the increase of positive affect and the increment of empathy or warmth toward others (Ashar et al.,2016; Klimecki et al., 2013), and the development of social connectedness (Hutcherson, et al., 2008; Kok et al., 2013).

On the other hand, (self)compassion has also proven to be a useful tool for managing psychopathology or other life stressors as it helps individuals to reframe their attitudes towards difficulties and lessen their impact (Neff, 2003). In this line, results from meta-analysis and systematic reviews on this association, show negative correlations between compassion and psychopathology (Kirby et al., 2017; MacBeth & Gumley, 2012; Muris and Petrochi, 2017; Wilson et al., 2019) Specifically, these studies indicate large effect sizes for the negative association between self-compassion and psychopathology (r = -0.54 and r = -0.53) (MacBeth & Gumley, 2012; Muris & Petrocchi, 2017, respectively) and a significant moderate effect size in reducing depression (d = 0.64), anxiety (d = 0.49) and psychological distress (d = 0.47) in various groups both with and without mental health conditions (Kiryby et al., 2017). Similarly, results from a recent meta-analysis indicated that self-compassion related therapies produced greater improvements in anxiety (g = 0.46) and depressive symptoms (g = 0.40) among clinical and subclinical populations and show a significant medium effect size for the reduction of self-criticism (g = 0.51) (Wakelin et al., 2022).

Lastly, CBIs have proven their effectiveness in reducing psychopathology among numerous different clinical samples such as eating disorders (Gale et al., 2014), post-traumatic stress disorder (Luo et al., 2021), personality disorders (Lucre & Corten, 2013) or psychosis and paranoia (Braehler et al., 2013; Mayhew & Gilbert, 2008).

3.4. Effectiveness of CBIs on CMCs populations

As mentioned in the previous sections, compassion and self-compassion may suppose a useful tool to help individuals with CMCs to better adjust to their disease by promoting an alternative approach that allows individuals to cope with negative emotional states and detrimental psychological processes that may appear. This, in turn, will help them to developed health-related behaviors and promote a better self-care which ultimately will lead to a better quality of life and well-being (Semenchuk et al., 2022; Terry & Leary, 2011).

In this sense, results from different studies show that compassion and self-compassion are associated with different aspects related to illness self-management such as adaptive coping and health-related behaviors (Dunne et al., 2018; Homan & Sirois, 2017; Sirois et al., 2015), exercising (Magnus et al., 2010), seeking social support or medical treatment (Brion et al., 2014; Terry & Leary, 2011), improving treatment adherence (Sirois & Hirsch, 2019) and taking a proactive health focus (Terry et al., 2013).

In the same line, a meta-analysis exploring the relationship between self-compassion, physical health and health behavior among different populations (Phillips et al., 2019), reported that self-compassion may influence physical health by alleviating stress (Homan & Sirois, 2017) and by fostering resilience (Neff, et al., 2007), adaptive coping (Allen & Leary, 2010), adaptive emotions (Sirois et al., 2015) and health-promoting behaviors (Sirois & Rowse, 2016).

In the context of CMCs, various RCTs report benefits of compassion and self-compassion on both physical and psychological outcomes among different CMCs samples. For instance, results show that training (self)compassion was associated with a decrease in HbA_{1c}, and lower diabetes-specific distress and depression in individuals with type 1 and type 2 diabetes (Friis et al., 2016); an enhancement in self-compassion, pain acceptance and a reduction in pain interference, catastrophizing and anxiety in chronic pain patients (Torrijos-Zarcero et al., 2021); and with a reduction in the levels of brain-derived neurotrophic factor (BDNF) and an improvement on the functional status of fibromyalgia patients (Montero-Marin et al., 2019). Moreover, other studies indicate links between self(compassion) and a higher health-related quality of life in individuals with multiple sclerosis (Nery-Hurwit, et al., 2018) and other chronic conditions such as hypertension, congestive cardiac failure, rheumatoid arthritis, psoriasis or Crohn's disease (Pinto-Gouveia et al., 2014).

In light of these findings, three recent systematic reviews exploring the effectiveness of various CBIs on populations with CMCs have concluded that CBIs are effective in improving different outcomes such as depression, anxiety, self-compassion or health-related quality of life (Austin et al., 2021; Hughes et al., 2021; Kiliç et al., 2021).

In conclusion, these findings show the potential benefits of CBIs in the treatment of individuals suffering from different CMCs. However, methodological limitations have been identified in the systematic reviews since they were based on small-scale RCT studies that do not explore the mechanisms underlying the efficacy of these interventions (Austin et al., 2021; Hughes et al., 2021). In this sense, further research identifying mediators and moderators in sufficiently powered controlled studies is needed to better understand how CBIs exert their benefits (Phillips et al., 2019). Moreover, CBIs suppose time and resource-consuming interventions that require active participation from individuals (e.g. attending to session appointments) and this along with some barriers of access, mobility, or transportation, could suppose a limitation to the effectiveness of these interventions on CMCs population (Jerant et al., 2005; Kiliç et al., 2021). Consequently, further research on online adaptations of these interventions may help to overcome these barriers and improve effectiveness of CBIs in individuals suffering from CMCs (Karekla et al., 2019).

4. The use of the Internet in the application of CBIs: Internet-based interventions (IBIs) and their effectiveness

Although psychological interventions have been proved to be effective for a great number of mental disorders and physical conditions, access for many people who need them is still limited (Henderson et al., 2013; Thyloth et al., 2016). Moreover, limitations in terms of investment and resources, stigmatization or geographical and time restrictions, indicates that it is priority to change the way of delivering these interventions (Baños et al., 2022; Harvey & Gumport, 2015). In this sense, the inclusion of Information and Communication Technologies (ICTs) (e.g. virtual reality, augmented reality or Internet) could help overcome these barriers by facilitating access, cost-effectiveness and attractiveness and by improving the effectiveness of psychological interventions (Balcombe & De Leo, 2021; Baños et al., 2022; Kazdin & Blase, 2011).

In this context, Internet-based interventions (IBIs) have emerged as a useful alternative to overcome the difficulty of disseminating psychological treatments (Andersson & Titov, 2014). IBIs, also named as e-therapy, online interventions, or computerized psychotherapy, can be defined as therapeutic programs with specific health objectives conveyed through modules delivered mainly using the Internet (Andersson & Titov, 2014; Barak et al., 2009). There exist many varieties of IBIs that can be classified into the following six categories (Barak et al., 2009): a) web-based education interventions; b) self-guided web-based therapeutic interventions; c) human-supported web-based therapeutic interventions; d) online counseling (e.g., chat, video-based); e) Internet-operated therapeutic software (e.g., robotic simulation, gaming); and f) other online activities (e.g., blogs, podcasts). Moreover, components of these interventions usually involve educational content, multimedia resources (e.g. text, images or videos), interactive online activities such as online quizzes and some kind of guidance or support (e.g. automatic reminders or therapist feedback) (Vara, 2018)

The involvement of the therapist is one of the aspects that has served the most to classify and differentiate one IBIs from another. In this sense, some interventions fully automated and independent of human support (self-guided or unguided interventions), and others can be combined with contact or support of a therapist or technician (guided interventions) (Andersson, 2009). Contact with the therapist could take different forms (e.g. contact provided in person, by telephone or email) and vary in terms of time spent with the patient or type of support provided (e.g. clarifying questions, technical or personal support) (Andersson et al., 2009; Cuijpers & Schuurmans, 2007). Combinations of guided IBI with regular contact with a therapist during the intervention are called blended treatments (Wentzel et al., 2016).

Research on the effectiveness of IBIs suggests that the Internet can be a useful tool for the assessment, prevention and treatment of different clinical conditions (Andersson, 2016; Ebert et al., 2018; Karyotaki et al., 2021). Specifically, evidence shows that IBIs can be as effective as traditional face-to-face approach not only for the treatment of a great variety of psychological and somatic disorders (Carlbring et al., 2018) but also for promoting healthy behaviors (Allam et al., 2021; Webb et al., 2010) and preventing psychological problems (Sander et al., 2016).

4.1. Effectiveness of IBIs in chronic medical conditions

In the context of CMCs, there exist specific barriers that make the change in the approach of delivering psychological treatments even more necessary. In addition to the barriers already mentioned (e.g. limited availability of evidence-based treatments, time limitations or stigmatization), other reported barriers in CMCs populations are: limited mobility, barriers in accommodation and accessibility, in appointment scheduling or barriers caused by poor coordination of care within the healthcare team, inadequate need assessment and lack of clinician referral (Fradgley et al., 2015; Kazdin, 2017; Mosher et al., 2010). Consequently, the use of ICTs might be a cost-effective innovative approach to overcome these barriers, hence improving evidence-based treatments and enhancing the well-being and health status of people with CMCs (Figueiras & Dias-Neto, 2019; Rogers et al., 2017).

In fact, evidence shows that patients with chronic conditions are increasingly incorporating ICTs to manage their disease in different ways such as a self-management tool or as a source of information for increasing health-related knowledge and a greater sense of empowerment to improve their health (Zulman et al., 2015). The current state of the use of Internet- and mobile-based interventions (IMIs) in the context of CMCs has been recently reviewed by Bendig and colleagues (2018), concluding that these interventions can be both integrated as a part of the medical treatment or provided as a unique intervention. Moreover, they could be applied on the following areas or phases of the intervention: prevention, initiation of treatment, component of the treatment or follow-up (Bendig et al., 2018).

Recent evidence from meta-analyses and systematic reviews have pointed out at different benefits from IBIs not only for reducing symptomatology but also for promoting lifestyle changes or, as support to the medical treatment (Bendig et al., 2018; Mehta et al., 2019; White et al., 2022). Specifically, a recent meta-analysis assessing the efficacy of 25 internet-based CBT interventions (iCBT) on anxiety and depression among populations with chronic health conditions found that iCBT resulted in significant improvements in overall anxiety and depressive symptoms (Mehta et al., 2019). This study replicated previous results of two meta-analysis concluding that iCBTs were effective for improving psychological outcomes (reducing depression, anxiety and distress) and disease-related physical outcomes (e.g. pain, headache, fatigue…) (Cuijpers et al., 2008; van Beugen et al., 2014).

Similarly, in a recent meta-analysis of 70 studies across 17 health conditions (e.g. cancer, chronic pain, diabetes, fibromyalgia, etc), White and colleagues (2022) concluded that web-based interventions were more efficacious than control conditions in reducing symptoms of depression (g = 0.30), anxiety (g = 0.19), and distress (g = 0.36) but, results for specific illnesses resulted inconclusive.

On the other hand, results from the revision carried out by Bendig and colleagues (2018) concluded that Internet and IMIs are also potentially effective to promote lifestyle changes or support medical treatment in people with chronic somatic diseases.

Lastly, results from another systematic review of systematic reviews and meta-analysis exploring the effectiveness and cost-effectiveness of eHealth in somatic diseases concluded that eHealth is effective/cost-effective or evidence is at least promising (Elbert et al., 2014).

Despite these positive results, evidence of IBIs for population with CMCs is limited as results from studies are heterogeneous and inconclusive, especially evidence on specific settings or for specific health conditions (Bendig et al., 2018; White et al., 2020). Moreover, although the most attention and evidence has been directed to iCBT therapeutic approach (Andersson, 2009), more research is needed exploring how other evidence-based approaches in the context of CMCs (e.g. compassion-based interventions) could be improve incorporating ICTs.

In this line, incipient evidence shows the potential value of delivering CBIs online on different outcomes such as decreasing stress and anxiety levels and increase self-compassion levels in a sample of university students during COVID-19 home confinement (González-Garcia et al., 2021); reducing self-criticism in a non-clinical sample (Halamová et al., 2020); reducing depressive and anxiety symptomatology and increasing self-compassion, mindfulness and satisfaction with life in a highly self-critical population (Krieger et al., 2019); or improving daily self-compassion and reducing perceived stress and emotional exhaustion in an employee's sample (Li et al., 2021).

Few studies also point out to promising results of adapting CBIs to an online format in the context of chronic illnesses (Finlay-Jones et al., 2020; Muftin et al., 2022). Specifically, evidence suggests that CBIs online may be a cost-effective approach to promote mental health of individuals with chronic illnesses (Carvalho et al., 2022) and may improve adherence and facilitate the involvement of chronic patients in a better management of their illness (Karekla et al., 2019). Therefore, research on the effectiveness of CBIs delivered online for population chronic medical conditions is needed to cover this gap and to explore the potentialities and advantages of delivering compassion via the internet to promote well-being and quality of life in populations with CMCs.

5. Outline of this dissertation

As shown in previous sections, the experience of living with chronic conditions may carry important psychological and social consequences and can significantly disrupt the lives of individuals who suffer from them (Golics et al., 2013; McAndrew et al., 2008; Hoyt & Stanton, 2012). In addition, due to their increasing prevalence and high rates of comorbidity, chronic illnesses have become one of the major concerns for worldwide healthcare (Centers for Disease Control & Prevention, 2009; WHO, 2019).

Chronic conditions suppose specific challenges since individuals are required to manage specific disease symptomatology and their consequences to better adjust to their disease. At the same time, individuals may need to deal with negative detrimental psychological processes (self-blame or self-criticism) which interfere with illness management.

Compassion and self-compassion may be a useful approach to illness management since they involve accepting suffering as an inevitable human condition and facilitate a kinder and more compassionate attitude towards difficulties (Neff, 2003). Moreover, adapting this intervention to an online format could help overcome delivery barriers that could interfere with the effectiveness of CBIs in people with chronic illnesses and help to respond to the growing need of healthcare systems for scalability and sustainability (Jerant et al., 2005; Karekla et al., 2019).

In this sense, CBIs delivered online may be good alternative approach to improve quality of life and well-being in CMCs. In recent years, these approaches have begun to accumulate empirical evidence, although more research is still needed, particularly in chronic medical conditions population. Therefore, the **main goal** of this dissertation is to analyze the efficacy of a CBI delivered online (the Internet Attachment-Based Compassion Therapy; iABCT; Campos, 2020) to improve the quality of life and well-being in a population with chronic medical conditions.

In particular, this study has four **specific objectives**:

1. To analyze the efficacy of the iABCT program in improving quality of life and well-being and other secondary outcomes (compassion, self-compassion, self-care behaviors, illness interference, self-criticism, symptomatology, attachment styles, social support, illness perception) at 3-month and 6-month follow-ups
2. To analyze the acceptability of the iABCT program in terms of expectations, satisfaction, usability and participants' opinion.
3. To explore the possible mediator role of several relevant variables in the effect of the condition on quality of life and well-being of the participant.
4. To explore in a qualitative study, the reasons for droppping or not participating in the intervention along with improvements for these programs.

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CHAPTER TWO

EFFECTIVENESS OF THE INTERNET ATTACHMENT-BASED COMPASSION THERAPY (IABCT) TO IMPROVE THE QUALITY OF LIFE AND WELL-BEING IN A POPULATION WITH CHRONIC MEDICAL ILLNESS.

CHAPTER 2. Effectiveness of the Internet Attachment-Based Compassion Therapy (iABCT) to improve the quality of life and well-being in a population with chronic medical illness.

1. Introduction

Chronic conditions are defined as non-communicable longstanding diseases that require ongoing treatment or suppose a significant functional alteration or both (CDC, 2002; WHO, 2008). Due to its rising prevalence along with their important consequences (e.g., hospitalization, long-term disability or work limitations), these conditions are becoming a significant burden not only to individuals who suffer them, but also their families and society (Dobbie & Mellor, 2008; Golics et al., 2013; Thornicroft et al., 2015).

Furthermore, there are high rates of comorbidity between mental health problems and chronic medical conditions, being one of the most important challenges faced by health-care providers and policymakers (Barnett et al., 2012; Salisbury, 2012). These comorbidities have been extensively reviewed (Conversano, 2019; Daré et al., 2019), and studies have shown that individuals with chronic medical illnesses (e.g., chronic pain, diabetes or inflammatory bowel disease) commonly experience depression or anxiety (Breivik et al., 2006; De Ornelas et al., 2012; Viganò et al., 2018), and negative health outcomes such as low satisfaction with life (Strine et al., 2008) or diminished quality of life (Tóthová et al., 2014). This comorbidity reflects a reciprocal interaction in which the negative consequences of the disease not only depend on the course and severity of the illness itself, but also on other psychological processes. For instance, the psychological adjustment process to the disease, the coping strategies to face stress associated with the disease, and the patient's illness management have a direct influence on physical health, including morbidity, mortality and disease complications

(Evers et al., 2014; Figueiras & Neto, 2019; Tuccero et al., 2016; Vancampfort et al., 2017). Likewise, detrimental psychological processes (e.g., illness-related shame, self-criticism or rumination) suppose a barrier to implement self-care behaviors involved in an adaptive illness management (e.g., treatment plan adherence, exercising, or dietary guidelines adherence), which, in turn, could further increase distress, worsen prognosis and detriment the quality of life (Callebaut et al., 2017; Dammers, 2020; Soo et al., 2009). As a consequence, both self-care behaviors included in the illness management as well as detrimental psychological processes have become a target of different psychological interventions aimed at promoting quality of life of the population with chronic medical illness (Carvalho et al., 2022).

This is the case of compassion-based interventions (CBI), which refer to psychological interventions aimed at enhancing compassionate and self-compassionate responses which involve the recognition of suffering and the inclination to relieve it with an act of kindness rather than criticizing, blaming, or pitying (Gilbert, 2009). Compassion and self-compassion may be a useful approach to illness management since they involve accepting suffering as an inevitable human condition and facilitate a kinder and more compassionate attitude towards difficulties (Neff, 2003).

Several studies have shown that CBIs can be especially beneficial for improving the quality of life of people with chronic illness (Friis et al., 2016; Lathren et al., 2018; Penlington, 2019). Two recent systematic reviews have concluded that CBIs are effective in populations with chronic medical conditions, as their results showed improvements in different physical and psychological outcomes such as depression, anxiety, self-compassion and health-related quality of life (Austin et al., 2021; Kiliç et al., 2021).

In sum, being able to approach difficulties with a compassionate attitude helps individuals to feel empowered with new management strategies and promote a sense of calm and agency to provide comfort to themselves, which facilitates the implementations of self-care behaviors and adaptive illness management (Morgan et al., 2020; Sirois et al., 2015).

One of the CBI that has proved its efficacy on both healthy population and patients with chronic medical conditions is the Attachment-Based Compassion Therapy (ABCT) (García-Campayo et al., 2016). This therapy is based on attachment theory (Fearon & Roisman, 2017), which provides a framework for understanding the links between close relationships and psychopathology and includes specific practices to identify and develop a secure attachment style to promote compassion for oneself and others (García-Campayo et al., 2016). Specifically, the ABCT has shown its efficacy and applicability for the treatment of fibromyalgia showing improvements on psychological outcomes such as functional status (Montero-Marín et al., 2018) and biological outcomes (Montero-Marín et al., 2019). There are specific delivery barriers that could interfere with the effectiveness of CBIs in people with chronic illnesses, such as limitations of access, mobility, or transportation. In order to tackle these limitations and to respond to the growing need of healthcare systems for scalability and sustainability, evidence-based interventions can benefit from adapting its delivery format through information and communications technologies (ICTs) (Jeran et al., 2005; Karekla et al., 2019). In fact, previous research supports the notion that the psychological outcomes of people living with chronic illnesses can be improved with a self-delivered online intervention (e.g. Elbert et al., 2014; McGeary et al., 2012), and incipient evidence shows the potential value of delivering CBIs online in the context of chronic illnesses (Finlay-Jones et al., 2020; Prentice et al., 2021). Moreover, other results show that adapting CBIs to an online format may improve adherence and facilitate the involvement of chronic patients in a better management of their illness (Karekla et al., 2019). Regarding the ABCT approach, an online version (iABCT) has been developed to be totally self-applied over the Internet for Spanish speakers. The iABCT is currently be assessed in a feasibility study for general population (Campos et al., 2020).

In conclusion, although CBIs delivered through the Internet seem to be a helpful cost-effective solution and incipient research is exploring the feasibility and acceptability of the iABCT on a Spanish general population (Campos et al., 2020), more research is needed on their efficacy in a context of chronic medical conditions.

1.1. Objectives and hypothesis

The present study aims to explore the efficacy of the iABCT (Campos et al., 2020) to improve the quality of life and well-being in a population with chronic medical illness, compared to waiting list (WL) as a control condition.

In particular, this study has six specific objectives:

1. To analyze the efficacy of the iABCT program in increasing quality of life and well-being and at 3-month follow-up after baseline compared to the WL group;
2. To analyze the efficacy of the iABCT intervention in increasing other secondary outcomes such as (self)compassion, self-care behaviors, self-criticism, symptomatology, attachment styles and social support.
3. To analyze data on the maintenance of the achievements in the intervention group and analyze the efficacy of the iACBT for the WL group at 6-month follow-up.
4. To analyze the acceptability of the iABCT program in terms of expectations, satisfaction, usability and opinion by the participantsTo analyze if self-criticism

and (self)compassion mediate the effect of the condition on the improvement on quality of life and well-being at 3-months follow-up.

5. To identify possible facilitators and barriers to the use of this type of protocols (e.g., treatment logic, duration, format, usability) taking into account the participant's perspective through a semi-structured qualitative interview. Specific hypotheses of this study are:

H1. Participants from the iABCT condition will show significant increases on quality of life and well-being at 3-month follow-up in comparison with the WL group

H2. Participants from the iABCT group will show significant increases on (self)compassion, self-care behaviors, secure attachment style and social support; and significant reductions on self-criticism, symptomatology and preoccupied, dismissive and fearful attachment styles at 3-month follow up in comparison with participants from the WL condition.

H3. The increases achieved after receiving the intervention will be maintained at 6-month follow-up for the iABCT condition.

H4. Participants in WL group will show an increased quality of life and well-being and other secondary variables at a 6-month follow-up, once they receive the iABCT.

H5. The iABCT will be well accepted in terms of expectations, satisfaction, usability and opinion by the participants.

H6. Changes in self-criticism and (self)compassion will appear as mediators of greatest changes in quality of life and well-being[1]

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[1] Note: No specific hypotheses are proposed regarding qualitative analysis due to its exploratory nature

2. Method

2.1. Study design

A two-arm, parallel-group, randomized controlled trial (RCT) was carried out to determine the effectiveness of the iABCT on improving the quality of life and well-being of a chronic medical conditions population by comparing individuals who have access to the intervention with a WL control group.

Participants were randomly assigned to one of the two conditions: a) intervention group (iABCT), and b) control group (WL) and completed different measures at different assessment points: baseline time (pre-assessment), and 3- and 6-month follow-up. Participants of the WL group received access to the iABCT after they fulfilled the 3-month assessment.

This study followed the CONSORT 2010 statement (Consolidated Standards of Reporting Trials, http://www.consort-statement.org) (Schulz et al., 2010), the CONSORT eHEALTH guidelines (Eysenbach et al., 2011), and the Recommendations for Interventional Trials (SPIRIT) (Chan et al., 2013)

2.2. Population and eligibility criteria

Sample was composed by a minimum of 68 Spanish adults, aged between 18 and 70 years, who self-report a current diagnosis of a chronic medical condition (e.g. diabetes, fibromyalgia, intestinal inflammatory illness, migraines, low-back chronic pain and other conditions). Additional inclusion and exclusion criteria can be seen in Table 1.

The sample size was estimated using the G*Power 3.1.9.7 for Windows program (Faul et al., 2007) and a required sample size of 68 participants as minimum was calculated.

Estimated sample size was decided based on medium effect sizes (d= 0.4), statistical power of .80 and $\alpha = .05$, indicating a necessary sample of 52 participants (Brysbaert et al., 2019). Considering that the dropout rate in Internet-based interventions for chronic medical conditions population is usually around 30%, a target of 34 people per group as minimum was set (Angeles et al., 2011; Cuijpers et al., 2008; Trompetter et al., 2015).

Table 1. Inclusion and exclusion criteria.

Inclusion criteria	Exclusion criteria
Age from 18 to 70 years	Presence of a terminal disease
Ability to understand and read Spanish	Presence of severe psychiatric disorders comorbidities (schizophrenia, substance dependence, bipolar disorder, psychotic illness) or severe neurologic or medical condition
Access to a computer with the Internet and having an email account	
Diagnosis of one of the following chronic medical conditions: diabetes, inflammatory bowel disease, fibromyalgia, low-back chronic pain, migraines and other conditions[2]	Receiving psychological treatment or mindfulness training at the time of recruitment

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[2] Diagnosis was self-reported by patients and no documents was required for the verification of this criteria.

2.3. Procedure (recruitment, randomization and ethics)

Participants were recruited by several means, including the study website and flyers posted on social media platforms (e.g., Facebook, Instagram, LinkedIn). Moreover, contact with doctors from different hospitals and health services and employees of chronic conditions patients' associations was established in order disseminate the study among their patients (e.g. Hospital Vall d'Hebron, Fibroapoyo association, Spanish Pain Society, Diabetes Spanish Federation, Hospital of Sagunto, etc). All distributed materials included a review of the study and a dedicated email address through which participants could contact the research team for further information on the study.

Prior to participation, interested participants received an access link to fill in the written informed consent together with the screening questionnaire through the LimeSurvey platform (https://www.limesurvey.org/es/). Informed consent online form included details of the trial, explanation about potential risks and benefits and contact information of the research members. Participants were informed that the intervention was completely optional and could be discontinued at any time. Informed consent was obtained online by pressing the consent button when the participant agreed to participate in the trial, before any intervention and assessments were provided.

The eligibility assessment consisted of demographic questions, assessment of history and current state of mental health and treatment history, and type or chronic medical illness diagnosis (see Table 1).

After giving online written informed consent to participate in the study and completing online eligibility assessment, participants who meet the criteria were randomized to the iABCT group or the WL control group and they were registered on the Psychology and Technology web platform (https://psicologiaytecnologia.labpsitec.es/) to complete the assessment measures at different points in time: pre-assessment and follow-up assessments. Participants in the intervention group had access to the program right after receiving the outcome, meanwhile participants in the WL control group had to wait 3 months to have access to the intervention.

An allocation scheme was created by an external researcher blind to the study using a computerized random generator (random allocation software 2.0) at a 1:1 ratio. Randomization was stratified by type of chronic medical condition (diabetes, fibromyalgia, intestinal inflammatory illness, migraines, low-back chronic pain and other conditions). Blinding for the treatment was not possible, as the participants and the researcher were informed about assigned condition.

This trial was conducted in compliance with the study protocol, the Declaration of Helsinki, and good clinical practice. Ethical approval for this trial was obtained for the Ethics Committee for Human Research of the University of Valencia (UV-INV_ETICA-1564960). The study was registered under Clinicaltrials.gov (NCT04809610) and was conducted following the Standard Protocol Items: Recommendations for Interventional Trials (SPIRIT) guidelines (Chan et al., 2013).

2.4. Intervention

Experimental group: Internet attachment-based compassion therapy (iABCT)

The iABCT is an online self-applied version of Attachment-based Compassion Therapy (ABCT) that has been adapted and optimized to be delivered via the Internet (Campos et al., 2020). As mentioned, the ABCT is based on the attachment theory and the use of compassion meditations, and therefore includes practices to raise awareness and/or address maladaptive aspects (when appropriate) of attachment styles developed with parents and compassion and self-compassion practices to improve interpersonal relationships and well-being general (García-Campayo et al., 2016). Following the original version, the iABCT is composed of 8 modules that have been formulated to be completely self-applied and share the same structure: (1) module objectives; (2) theoretical contents of the module; (3) exercises and activities (including formal and informal practices) to put what is learned in the module into practice; (4) assessment of the knowledge acquired during the module; (5) tasks to be completed before advancing to the next module (homework assignments); and (6) summary of the module.

Formal and informal compassion and self-compassion meditations such as receiving and giving compassion to oneself, friends, unknown people, and people deemed to be problematic; identifying their own attachment style; and understanding how it influences their current interpersonal relationships, are practiced during the intervention. The content of the modules includes texts, images, illustrations, videos, audio-guided meditations, interactive exercises, and daily homework assignments (see Table 2).

Along the modules, participants learned about what is compassion, how it works, and how they could practice compassion in order to change their approach to their illness and improve their quality of life. At the same time, participants were provided with contents that help them to understand their own attachment style and to improve their relationships with themselves.

Downloaded PDF files were available so that users could review them offline. Each module was optimized to have a duration of approximately 60 or 90 minutes. The entire intervention was estimated to be completed in eight weeks. Intervention modules, with their specific theoretical content and both formal and informal practices are shown in Table 2.

In addition to the intervention, participants received automated e-mails encouraging them to continue with the modules if they had not accessed the program for a week. Moreover, emails were sent to participants that finished module 3 encouraging encourage them to proceed with the program and reminding them of the importance of doing the homework practices.

Control group. Waiting list (WL) control group

The control group received no intervention for the first three months after enrolling in the study and completed the first assessment (pre-assessment). No specific instructions were given for participants who were already receiving medical treatment for their conditions.

After completing the second assessment (3 months), participants in this condition were informed that they had access to the iABCT program.

Table 2. Structure and contents of Internet Attachment-Based Compassion Therapy.

Module	Theoretical component	Formal practice	Informal practice
0: Introduction to attachment-based compassion therapy	– What is compassion? – Contexts of application – Attachment-based compassion therapy: structure and rationale – Meditation and compassion: formal and informal practice – Tips about meditation practice: when/where/how much/how meditate – The importance of progressiveness in compassion and homework		– 3-min compassionate practice
1: Preparing ourselves for compassion. Kind attention	– The workings of our brain – The reality of suffering: primary and secondary suffering – What is and is not compassion?	– Compassionate breathing and compassionate body scan – Compassion in coping with difficulties	– Self-compassion diary – Savoring and giving thanks
2: Discovering our compassionate world	– Going deeper into compassion and mindfulness terms – Compassion and related terms – Fear of compassion	– Connecting with basic affection – Developing a safe place – The compassionate gesture – Identifying the figure of secure attachment	– The object that joins us to the world (optional) – Diary of compassion practice – What are we good at?
3: Developing our compassionate world	– How compassion works – The figure of secure attachment – Efficacy of compassion – Self-criticism	– Developing the figure of secure attachment – Developing the compassionate voice	– Writing a letter to the figure of secure attachment (optional)
4: Understanding our relationship with compassion	– The biological bases of compassion – Attachment styles – Guilt – Importance of these styles in everyday life	– Becoming aware of our attachment style – Ability to receive affection: friend, indifferent person, and enemy – Guilty repair practice	– Letter to your parents – Observing our attachment styles in daily life
5: Working on ourselves	– The importance of the affection toward ourselves and others – Embarrassment	– Showing affection to friends and indifferent people – Showing affection to ourselves – Reconciliation with our parents – Repairing embarrassment	– The greatest display of affection (in general and from our parents) – 3 positive aspects and 3 negative aspects of our parents
6: Understanding the importance of forgiveness	– The concept of forgiveness – Phases of forgiveness – Utility of forgiveness – Basic resistances to generate forgiveness – Resources to generate forgiveness	– Forgiving yourself – Asking others for forgiveness (optional) – Forgiving others and showing compassion to enemies	– Interdependence – Compassion in daily life
7: Consolidating the practice of compassion	– Working in 3 periods (past, present, and future) – Envy – Usefulness of being our attachment figure – Difficult relationships – How to keep up the practice of compassion for a lifetime	– Working with envy – Becoming our own attachment figure – Handling difficult relationships	– Our values and their relationship with compassion – What would our lives be like if we started over?

2.5. Measures

Participants were assessed at baseline (pre-assessment) and 3- and 6-month follow-up. Assessments were conducted online via the platform web (https://psicologiaytecnologia.labpsitec.es/), where the iABCT was hosted. Outcome assessment followed the schedule outlined in Figure 1.

2.5.1. Screening related measures

Sociodemographic variables and meditation practice: Demographic data (age, sex, nationality, educational level, occupation, and civil status) were collected as part of the baseline assessment (pre-assessment). Variables regarding overall meditation practice were recorded as follows: any or no meditation experience, frequency of meditation (daily, 3 or 4 times a week, once a week or less, 2 or 3 times per month, sporadically, never), duration of each session (mean time in minutes), and lifetime practice (in years), and for participants with experience, the amount of time (in months) of meditation practice interruption and context of practice (secular or religious).

Fig 1. Schedule of enrolment, interventions and assessments.

	STUDY PERIOD				
	Enrollment	Allocation	Post-allocation		Close-out
TIMEPOINT			Baseline	3-month FU	6-month FU
	-t1	0	T1	T2	T3
ENROLLMENT					
Eligibility criteria	X				
Inform consent	X				
Allocation		X			
INTERVENTIONS					
iABCT			●———	———●	
Waiting list control group				●———	———●
ASSESSMENTS:					
Sociodemographic data			X		
Quality of life (EQ-5D)			X	X	X
Well-being (PHI)			X	X	X
Compassion and self-compassion (SOCS-S)			X	X	X
Self-care behaviors (B-MSC)			X	X	X
Self-criticism (SCRS)			X	X	X
Symptomatology (DASS-21)			X	X	X
Attachment styles (RQ)			X	X	X
Social support (MOS-SSS)			X	X	X
Difficulties in compassion meditation practice (The Compassion Practice Quality Questionnaire)				X*	X**
Expectations and satisfaction (Expectancy and satisfaction questionnaire)				X*	X**
Usability (SUS)				X*	X**
Participant's opinion (Qualitative Interview)				X*	X**

Note. Pre= pre-assessment, FU= follow-up, iABCT = Internet Attachment-Based Compassion Therapy, EQ-5D = EuroQol, PHI = Pemberton Happiness Index, SOCS-S = Sussex-Oxford Compassion for the Self Scale, B-MSC = Mindful Self-Care Scale - Brief version; SCRS = Self-critical rumination Scale, DASS-21 = Depression, Anxiety and Stress Scale, RQ = Relationships Questionnaire, MOS-SSS = Medical Outcomes Study-Social Support Survey, SUS = System Usability Scale

** This measure will only be fulfilled by the participants of the intervention condition.*

*** This measure will only be fulfilled by the participants of the waiting list condition.*

2.5.2. Primary outcome measures

Quality of life: The EuroQol 5-Dimensions Questionnaire (EQ-5D; The EuroQol Group, 1990) is a self-report measure that assesses the health-related quality of life (HRQOL) using five dimensions of functionality in daily-life: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. Responses in each dimension are divided into three levels of severity: (1) no problems; (2) moderate problems; and (3) extreme problems. Moreover, the EQ-5D includes two visual analogue scale (EQ VAS) in which participants self-rate their quality of life in a range from 0 (worst imaginable health state) to 100 (best imaginable health state) and their general health in the last 12 months in a range from -1 (worse health), 0 (same health) to 1 (better health). The Spanish version of this scale has shown good reliability and validity properties (Badia et al., 1999). Cronbach's alpha for this study was .70.

Well-being: The Pemberton Happiness Index (PHI; Hervás & Vázquez, 2013) is a scale which includes 11 items related to different domains of remembered well-being (general, hedonic, eudaimonic, and social well-being) and ten items related to experienced well-being (i.e., positive and negative emotional events that possibly happened the day before); the sum of these items produces a combined well-being index that ranges from 0 to 10. Results from the Spanish validation study provided very good support for the psychometric properties of the PHI (α=.92) (Hervás & Vázquez, 2013) and Cronbach's alpha for this study was .90.

2.5.3. Secondary outcome measure

Compassion and self-compassion: The Sussex-Oxford Compassion for the Self Scale (SOCS-S; Gu et al., 2019) is a 20-item scale that assesses the levels of self-compassion in a 5-point Likert scale ranging from 1 (not at all true) to 5 (always true). It includes 5 subscales: recognizing suffering, understanding the universality of suffering, feeling for the person suffering, tolerating uncomfortable feelings, and acting or being motivated to act to alleviate suffering. The validation study of this scale has shown adequate psychometric properties (Cronbach's alphas ranged from .75 to .93 for total SOCS-S scale and subscale items) (Gu et al., 2019). For this study a translated and adapted version of the original scale into Spanish was used and Cronbach's alpha for the total score of the SOCS-S was .92.

Self-care behaviors: The Mindful Self-Care Scale - Brief version (B-MSC; Hotchkiss & Cook-Cottone, 2019) is the 24-item shortened version of the Mindful Self Care Scale (MSCS; Cook-Cottone & Guyker, 2017). This scale measures the frequency of self-care behaviors addressed in 6 domains: mindful relaxation, physical care, self-compassion and purpose, supportive relationships, supportive structure, and mindfulness. Cronbach's alpha for the B-MSCS domains showed adequate values ranging from .74 to .86 (Hotchkiss & Cook-Cottone, 2019). In this study, a translated and adapted version of the original scale into Spanish was used and Cronbach's alpha for the domains ranged from .71 to .93.

Self-criticism: The Self-critical Rumination Scale (SCRS; Smart et al., 2015) is a 10-item questionnaire measuring self-criticism, defined as a form of negative thinking that devalues the self. It assesses thoughts that criticize the self for perceived errors, failures, weaknesses, defects, bad habits, or general inadequacy. It takes into account the ruminative qualities of thought: frequency, duration, repetition, and difficulty of control. Final scores range from 10 to 40 and higher scores indicate a higher level of self-criticism. The Spanish validation of this scale has shown good psychometric properties (α=.91) (Martínez-Sanchis et al., 2021). In this study, Cronbach's alpha for the total score was .93.

Symptomatology: The Depression, Anxiety and Stress Scale (DASS-21; Henry & Crawford, 2005) is an abbreviated form of the DASS questionnaire containing 21 items and organized in three subscales to assess anxiety, depression, and stress symptomatology. Responses indicate the presence of each symptom over the past week on a 4-point Likert-type scale ranging from 0 (*never*) to 3 (*almost always*). The Spanish validation of this scale has shown acceptable internal consistency (Cronbach's alpha for the total score was 0.94 and Cronbach' alpha for Depression, Anxiety and Stress scales were 0.85, 0.85 and 0.87, respectively) (Daza et al., 2002). In this sample, Cronbach's alpha for the total score of the DASS-21 was .95.

Attachment styles: The Relationships Questionnaire (RQ; Bartholomew & Horowitz, 1991) uses a 7-point Likert-scale that assesses and matches participants with one of four attachment styles: (i) secure, (ii) preoccupied, (iii) dismissive and (iv) fearful. Studies for both original and Spanish versions of the scale have demonstrated that the reliability of the self-descriptor criteria is high (Yárnoz-Yaben & Comino, 2011).

Social support: The Medical Outcomes Study-Social Support Survey (MOS-SSS; Sherbourne & Stewart, 1991) is a 20-item questionnaire that analyzes the perception of social support. Item 1 refers to the size of the social network and the remaining 19 items measure four dimensions of functional social support: emotional (8 items), instrumental (4 items), positive social interaction (4 items), and affective support (3 items). The items present a 5-point response scale that measures progressively (from never to always) how often each type of social support is available to the caregiver. A total score can also be obtained, where higher scores would indicate more support received. The Spanish version of the scale has shown good reliability properties (α=.94) (Requena et al., 2007) and Cronbach's alpha for this sample was .96.

Quality of compassion meditation practice: The Compassion Practice Quality Questionnaire (Navarrete et al., 2021) has been developed to assess difficulties related to the practice of compassion meditation. This self-reported questionnaire includes 10 items that participants score on a scale ranging from 0 to 100 indicating the percentage of time that their experience reflects each statement. Higher scores represent higher quality of the compassion-based meditation practice. The Spanish version of this questionnaire has been adapted by Campos et al. (2020) and Cronbach's alpha for this study was .95.

2.5.4. Acceptability outcome measures of intervention

Expectations and satisfaction: Expectancy and satisfaction questionnaire (adapted by Campos and colleagues (2020) from Borkovec and Nau (1972). This questionnaire was adapted from Borkovec and Nau (1972) to measure participant expectation and satisfaction with the program. This scale includes 8 items rated from 0 to 4 that addressed participant's satisfaction with the program in terms of the quality and quantity of the services received, how helpful the program was for solving and dealing with their problems, to what extent the program was what the participant expected, whether the participant would recommend the intervention to others, whether participants would use the program again in case they need it, and overall satisfaction with the program. Higher scores represent higher expectations and satisfaction levels. In this study, Cronbach's alpha was high (α=.95).

Usability: System Usability Scale (SUS; adapted by Campos and colleagues (2020). This instrument was adapted from the System Usability Scale (SUS) in order to assess the usability of a service or product and the acceptance of technology by the people who use it. The SUS has been shown to be a valuable and robust tool for assessing the quality of a wide range of user interfaces, as it is easy to use and understand. This scale includes 10 statements rated on a five-point scale measuring agreement with the statement (0 = strongly disagree; 4 = strongly agree). The final score is obtained by adding the scores on each item and multiplying the result by 2.5. Scores range from 0 to 100, where higher scores indicate better usability. Cronbach's alpha for this sample was high (α=.90).

Participant's opinion: Semi-structured qualitative interview. A qualitative interview will be adapted to explore reasons for participant's dropout or no participation in the trial (Quiñonez-Freire et al., 2020; van der Hout et al., 2021). Reasons for dropping out or not participating in the trial will be further explored using an online form with pre-set response options, and multiple reasons will be allowed. Additionally, options will be available to expand participants' qualitative responses.

2.6. Data analysis

The latest version of SPSS (v.26) was used for all data analysis. T-tests for independent-samples (t), ANOVAs, and chi-square analysis (χ2) were calculated to investigate the characteristics of the randomized sampled and included in the RCT and to explore group differences in participants' sociodemographic (e.g., age, gender) and clinical data (e.g., quality of life, well-being). Attrition and dropout rates were calculated by reporting percentages and patterns of missing data. Intent-to-treat mixed-model analyses without any ad hoc imputations were used to handle missing data in case of participant dropout and to conduct the efficacy analysis (Chakraborty & Gu, 2019). This analysis compares the study groups based on the treatment to which they were randomly allocated. It does not assume that the last measurement is stable, it does not involve any substitution of missing values with supposed or estimated values, it is conducted using all available observations, thus reducing the biases and loss of power caused by the simple deletion or random imputation of incomplete data. Mixed-model analyses are appropriate for RCTs with multiple time points and pre-post designs, and it has showed remarkable robustness to violations of distributional assumptions (e.g., skewed, kurtosis, or heteroscedastic) (Salim et al., 2008; Schielzeth et al., 2020). To study distributional assumptions and the impact of missing random effect components on model some tests were included: Normality assumptions were explored using the Shapiro-Wilk test (for each experimental group, N < 50), the Kolmogorov-Smirnov (K-S) test (for the total sample, N > 50), skewness and kurtosis indices, and normality plots (Q-Q plots). Homoscedasticity was explored by Levene's test and Box's M test for equivalence of covariance matrices. Wald statistic (or Z-test) was conducted to test the residual error variance estimation and the null hypothesis of homogeneity of residuals. The assumption that data is missing completely at random (MCAR) was evaluated using Little's MCAR test. it is robust to violations of distributional assumptions. A linear mixed-effect model for each outcome measure was implemented using the MIXED procedure with one random intercept per subject. An identity covariance structure was specified to model the covariance structure of the intercept. For each outcome, time (baseline and 3- and 6-month follow-up) was treated as a within-group factor and group (experimental and control group) as a between-group factor and significance effects were followed up with pairwise comparisons (adjusted by Bonferroni correction). Cohen's d effect size and 95% CI was calculated for within- and between-group comparisons (Cohen, 1988; Cumming & Calin-Jageman, 2017). Sensitivity analyses were performed to assess the robustness of the findings in terms of different methods for handling missing data (i.e., mixed models with and without imputation, maximum-likelihood estimation, and maximum-likelihood multiple imputation (Thabane et al., 2013). The means and standard deviations of the acceptability measures of the intervention were analyzed.

Finally, to explore the mediator variables, mediation analyses were performed using the procedure described by Hayes (2013) with the PROCESS macro (version 2.4), choosing model 4. Six simple mediation analyses were performed to test whether the effect of condition on the post EQ-5D and PHI scores was mediated by the change in self-criticism and (self)compassion (SCRS and SOCSS scores). Changes in self-criticism and (self)compassion were calculated using the baseline and 3-month follow-ups SCRS and SOCSS scores respectively. Bias-corrected bootstrap 95% CIs based on 5.000 samples were used to assess the indirect effects. CIs that did not include the zero-value indicated a significant indirect effect, meaning that the effects of the condition on the 3-month follow-up scores were mediated by the changes in self-criticism and (self)compassion.

Finally, participants' qualitative responses regarding facilitators and barriers to the intervention were explored using a qualitative content analysis and coding and categorization approach to the data using word frequency counts with ATLAS.ti software (v. 23). A thematic analysis of qualitative data was conducted by a researcher (MM) to identify common themes in relation to participant's opinion on different aspects of the intervention program, and provide further insight into user experiences. Following a comprehensive analysis and interpretation of raw data, initial themes were generated, coded (MM) and these were reviewed by a co-researcher (MDV) who has experience in qualitative analysis. The objective of this process was to identify and validate key patterns within a number of themes across a dataset (Braun and Clarke, 2006).

The state of the art of analytic methodology for RCT was reviewed before analyzing the data, in order to apply the most appropriate statistical analysis procedure.

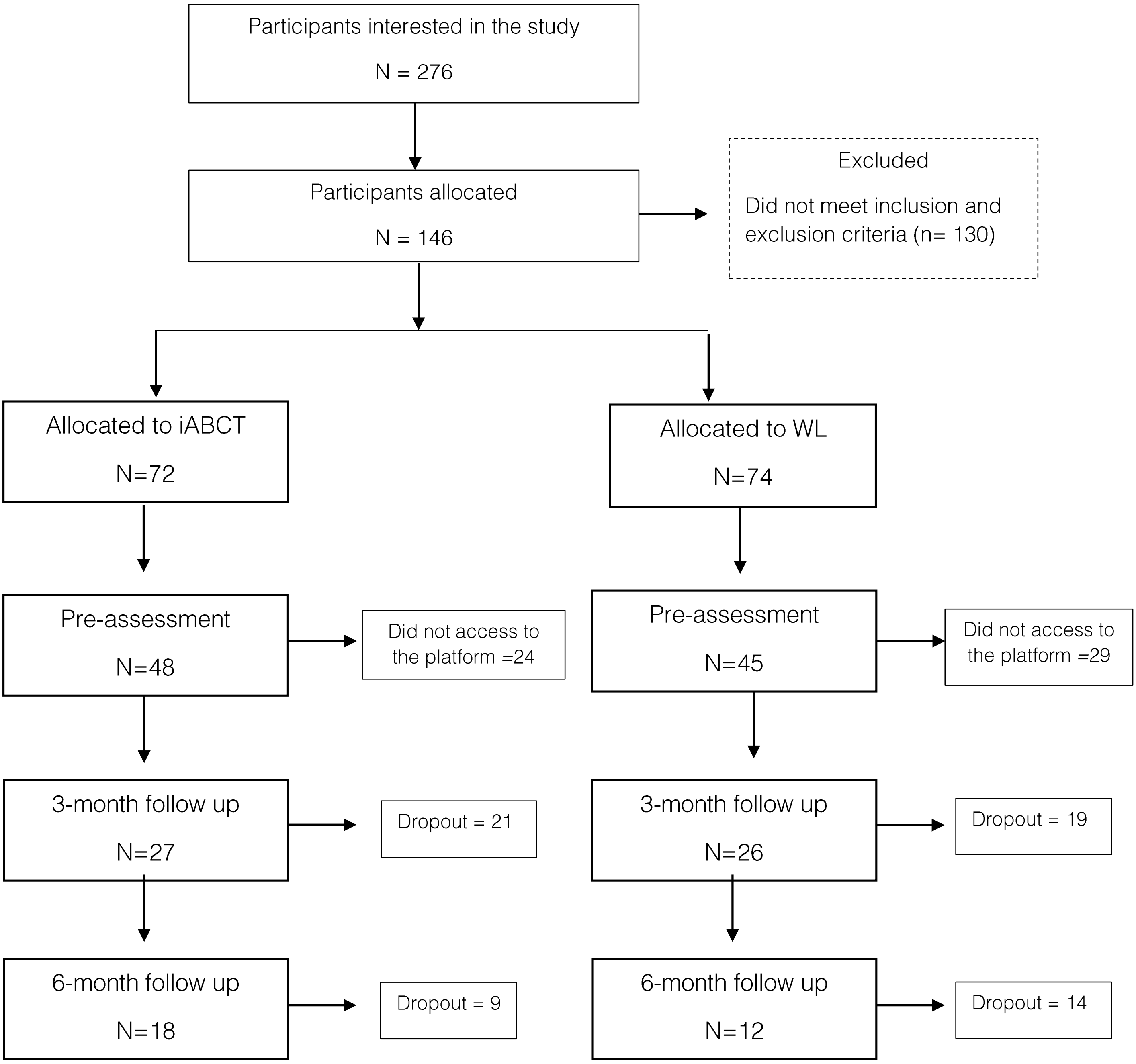
3. Results

3.1. Participants flow an attrition

Initially, 276 participants were interested in the study, and 130 were excluded from the trial because they did not fulfill the eligibility criteria. Thus, a total amount of 146 participants were included in the study and randomly allocated to each condition (iABCT, n = 72; WL, n = 74). 53 out of those 146 participants decided not to participate in the study (24 from the iABCT group, and 29 from the WL group). Finally, 43.75% of participants from the iABCT condition and 42.22% from the WL condition dropout of the 3-month follow up, and 33.33% of participants from the iABCT condition and 53.85% from the WL condition dropped out during the 6-month follow-up (see Figure 2). Data were missing completely at random (MCAR) (p >.05).

Regarding the percentage of participants who completed each module in the iABCT condition, only 25% of participants completed all the treatment modules, 27,8% completed five modules, 31.9% four modules, 37.5% three modules, and 41.7% two modules. In the case of the WL condition after giving them access to the intervention, only 10.8% of participants completed all the treatment modules, 12.2% completed six modules, 14.9% five modules, 16.2% three modules, and 17.6% two modules.

Figure 2. Participants flow diagram



3.2. Baseline sociodemographic and clinical characteristics

Table 3 shows participants' sociodemographic data for each condition. There were no statistically significant differences between groups on sociodemographic data: age, *t*(146) = -0.43, *p* = .668; sex, χ^2(1, N = 146) = 0.99, *p* = .320, Cramer's V = 0.08; comorbidity, χ^2(1, N = 146) = 0.67, *p* = .414, Cramer's V = 0.07; marital status, χ^2(3, N = 146) = 2.39, *p* = .495, Cramer's V = 0.13; educational level, χ^2(3, N = 146) = 1.87, *p* = .599, Cramer's V = 0.11; occupation, χ^2(7, N = 146) = 4.94, *p* = .667, Cramer's V = 0.18. However, significant differences between groups were found for the type of chronic condition, χ^2(11, N = 146) = 138.32, *p < 0.001* , Cramer's V = 0.97.

Table 3. Sociodemographic data for each condition

	iABCT n= 72	WL n= 74
Age M (SD)	48.18 (11.00)	47.39 (11.14)
Sex (%)		
Male	18.10	12.2
Female	81.90	87.8
Comorbidity (%)	37.50	31.1
Marital status (%)		
Single	16.70	24.30
Married/in a relationship	70,80	63.50
Separated/divorce	12.50	10,80
Widowed	0.00	1.40
Educational level (%)		
Primary studies	11.10	14.90
Secondary studies	31.90	25.70
University studies	56.90	58.10
Others	0.00	1.40
Occupation (%)		
Unemployed	16.70	13.50
Student	4.20	4.10
Household work	1.40	0.00
Employed	52.80	58.10
Time off work	5.60	5.40
Retired	9.70	4.10
Permanent disability	8.30	9.50
Others	1.40	5.40
Type of chronic medical condition (%)		
Fibromyalgia	20.80	18.90
Bowel inflammatory illness	29.20	27.00
Diabetes	11.10	9.50
Migraines	2.80	5.40
Low-back pain	4.20	1.40
Other conditions:	31.90	37.80

Regarding results on overall meditation practice, there were no statistically significant differences between groups on meditation experience, $\chi^2(1, N = 146) = 0.53$, *p* = .468, Cramer's V = 0.06; frequency of meditation $\chi^2(4, N = 53) = 1.28$, *p* = .865, Cramer's V = 0.16; duration of each meditation session, *t*(46) = -0.20, *p* = .842; lifetime practice, *t*(46) = -0.70, *p* = .489; the amount of time of meditation practice interruption, *t*(49) = 1.11, *p* = .275; and context of practice $\chi^2(1, N = 51) = 0.04$, *p* = .837, Cramer's V = 0.03 (see Table 4).

Table 4. Data on meditation practice

	iABCT n= 72	WL n= 74
Meditation experience (%)	34.70	40.50
Frequency of meditation (%)		
Daily	8.00	14.30
3 or 4 times a week	24.00	14.30
Once a week or less	20.00	21.40
2 or 3 times a month	24.00	28.60
Never	24.00	21.40
Duration of each session (minutes) M (SD)	18.10 (12.79)	17.44 (9.29)
Lifetime practice (years) M (SD)	1.63 (1.34)	1.37 (1.18)
Practice interruption (months)* M (SD)	8.35 (10.95)	11.85 (11.15)
Context of practice (%)*		
Secular	91.30	92.90
Religious	8.70	7.10

*Note: *only for experienced meditators*

Table 5 shows participants´ clinical data for each condition. There were only statically significant differences between groups on clinical outcomes such as (self)compassion (SOCS-S), indicating that participants of the WL condition showed higher levels of compassion and self-compassion. There were no statistically significant differences between groups on the rest of clinical outcomes (quality of life, well-being, self-care behaviors, self-criticism, symptomatology, attachment style and social support (*p* >.05).

Table 5. Clinical data and significant differences between conditions.

	iABCT n=48	WL N=45	
	M (SD)	*M (SD)*	Statistics
Quality of life			
EQ-5D			
Overall quality of life	-0.10 (0.78)	0.02 (0.75)	t(93) = 0.80, p = .429
General health	52.29 (17.41)	58.00 (19.61)	t(93) = 1.49, p = .141
Well-being			
PHI			
Total well-being	5.91 (1.99)	6.32 (1.72)	t(91) = 1.05, p = .295
Remembered well-being	5.92 (2.03)	6.36 (1.75)	t(91) = 1.10, p = .273
Experienced well-being	5.76 (2.46)	5.87 (2.26)	t(91) = 0.21, p = .831
Compassion and self-compassion			
SOCS-S			
SOCS Total score	66.78 (11.60)	73.67 (11.81)	t(87) = 2.75, p = .007*
Self-care behaviors			
B-MSC			
Physical care	2.79 (0.55)	2.84 (0.52)	t(90) = 0.43, p = .666
Mindful relaxation	2.27 (0.94)	2.58 (0.92)	t(90) = 1.58, p = .117
Self-compassion and purpose	2.63 (1.06)	3.06 (1.15)	t(90) = 1.84, p = .069
Supportive relationships	3.74 (1.05)	3.59 (1.03)	t(90) = -0.71, p = .481
Supportive structure	3.16 (0.92)	3.35 (1.04)	t(90) = 0.91, p = .364
Mindfulness	3.29 (1.15)	3.66 (1.06)	t(90) = 1.59, p = .116
Self-criticism:			
SCRS			
SCRS Total score	26.76 (7.68)	23.40 (8.12)	t(87) = -1.98, p = .051
Symptomatology:			
DASS-21			
Anxiety	13.32 (11.13)	12.48 (10.39)	t(86) = -0.36, p = .718
Depression	18.14 (12.44)	16.05 (12.26)	t(86) = -0.78, p = .435
Stress	21.14 (10.22)	20.19 (10.42)	t(86) = -0.43, p = .672
DASS Total score	52.59 (31.43)	48.71 (30.41)	t(86) = -0.58, p = .563
Attachment styles:			
RQ			
Secure attachment	4.56 (2.05)	4.86 (1.89)	t(85) = 0.70, p = .486
Preoccupied attachment	3.70 (2.21)	3.19 (2.10)	t(85) = -1.09, p = .281
Dismissive attachment	3.95 (1.80)	4.24 (1.75)	t(85) = 0.74, p = .460
Fearful attachment	3.81 (2.20)	3.17 (2.13)	t(85) = -1.39, p = .169
Social support:			
MOS-SSS			
MOS-SSS Total score	74.60 (17.05)	73.67 (15.31)	t(85) = -0.27, p = .790

Note: *$p < 0.05$

3.3. Differential effectiveness of the conditions

3.3.1. Change in primary outcomes at 3-month follow-up.

Quality of life (EQ-5D scores)

Results show significant condition x time interaction effects on overall quality of life, *F(*1, 68.01) = 6.33, *p* = .014, from baseline to 3-month follow-up.

Within-group comparisons showed significant increases for the iABCT condition at 3-month-follow up on overall quality of life and general health with medium effect sizes (*d*=0.60 and *d* =0.61 respectively), but no significant change was found in the WL group (see Table 6 and Figure 3 (a-b)).

For the overall quality of life subscale of the EQ-5D, between-group comparisons revealed that participants in the iABCT condition scored significantly higher at 3-month follow-up than the WL, with a medium effect size (*d = 0.62*; see Table 6 for details).

Well-being (PHI scores)

Results show significant condition x time interaction effects on total well-being, *F* (1, 60.72) = 4.69, *p* = .034, and remembered well-being, *F*(1, 61.79) = 4.71, *p* = .034.

Within-group comparisons showed significant increases at 3-month follow-up on total well-being and remembered well-being for the iABCT group corresponding to low effect sizes (*d*=0.26 and *d*=0.27 respectively), but no significant change was found in the WL group (see table 6 and Figure 4 (a-b)).

Between-group comparison did not reveal differences on PHI scores between the iABCT group and the WL group at 3-month follow-up, although participants from the iABCT scored higher than participants from the WL condition (see Table 6 for details).

Table 6. Means, standard deviations, within-group comparisons effect sizes and between group comparisons effect sizes at 3-month follow-up for primary outcomes

Measure	Condition	M (SD)			Within-group effect size, *d* [95% CI]		3-month follow-up	
		Pre	FU (3M)	FU (6M)	Pre vs. 3M	Pre. Vs 6M	Mean dif. iABCT vs. WL	Between-group effect size, *d* [95% CI]
Quality of life								
EQ-5D								
Overall quality of life	**iABCT**	-0.10 (0.78)	0.37 (0.74)	0.33 (0.69)	**0.60 [-0.30, -0.89]**	**0.54 [-0.32, -0.77]**	0.46*	**0.62 [0.07, 1.17]**
	WL	0.02 (0.75)	-0.08 (0.69)	0.33 (0.78)	-0.13 [0.43, -0.17]	0.41 [-0.10, -0.72]		
General health	**iABCT**	52.29 (17.41)	62.96 (19.33)	60.00 (23.52)	**0.61 [-0.37, -0.84]**	**0.44 [-0.19, -0.69]**	0.32	0.05 [-0.49, 0.58]
	WL	58.00 (19.61)	62.12 (16.50)	61.17 (22.62)	0.21 [0.03, -0.44]	0.16 [0.09, -0.41]		
Well-being								
PHI								
Total well-being	**iABCT**	5.91 (1.99)	6.43 (1.82)	6.10 (2.07)	**0.26 [-0.03, -0.48]**	0.09 [0.06, -0.25]	0.48	0.21 [-0.33, 0.75]
	WL	6.32 (1.72)	6.03 (1.87)	5.95 (2.73)	-0.17 [0.33, 0.01]	-0.21 [0.40, 0.02]		
Remembered well-being	**iABCT**	5.92 (2.03)	6.48 (1.89)	6.12 (2.16)	**0.27 [-0.04, -0.50]**	0.10 [0.06, -0.25]	0.49	0.21 [-0.33, 0.75]
	WL	6.36 (1.75)	6.08 (1.94)	5.94 (2.82)	-0.16 [0.31, 0.00]	-0.24 [0.43, 0.04]		
Experienced well-being	**iABCT**	5.76 (2.46)	5.78 (2.68)	5.94 (1.92)	0.01 [0.27, -0.29]	0.07 [0.20, -0.35]	0.35	0.13 [-0.41, 0.67]
	WL	5.87 (2.26)	5.47 (2.30)	6.09 (2.77)	-0.18 [0.49, -0.14]	0.10 [0.21, -0.41]		

*Note. d, Cohen's d; CI, Confidence Interval; Pre, Pre-assessment; FU (3M), 3-month follow-up; FU (6M), 6-month follow-up; iABCT, Internet Attachment-based Compassion Therapy; WL, waiting list; EQ-5D, EuroQol 5D; PHI, Pemberton Happiness Scale; *p < 0.05.*

Figure 3 (a, b). Changes in quality of life (EQ-5D scores) in both conditions (iABCT and WL) at pre-assessment and 3-month follow-up.

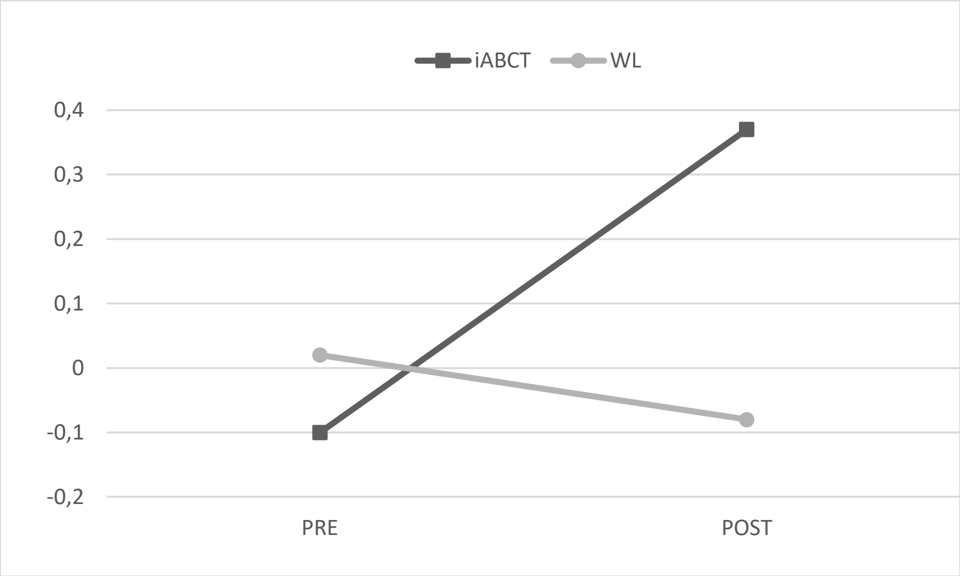


Fig. 3a. Changes in overall quality of life

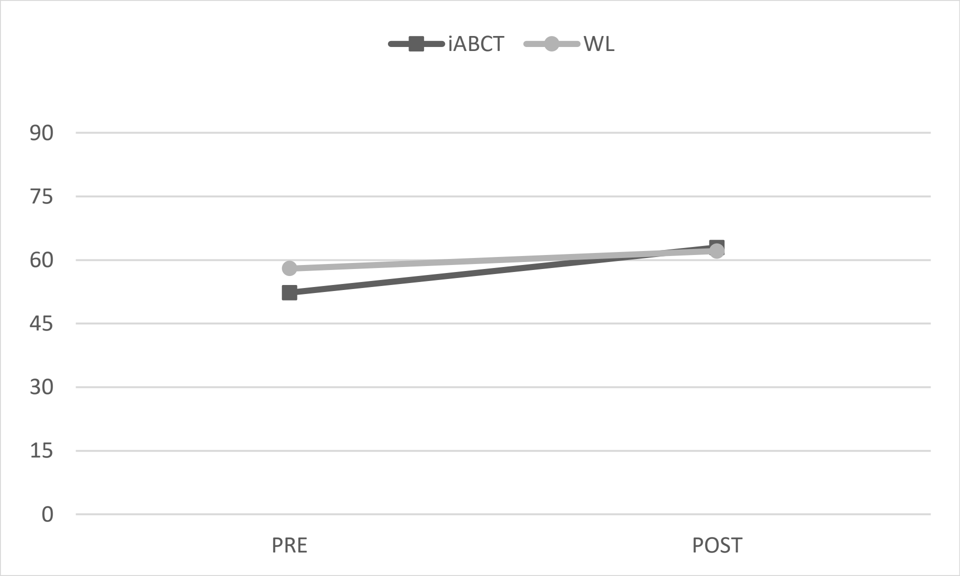


Fig. 3b. Changes in general health

Note. Pre, Pre-assessment; Post, 3-month follow-up; iABCT, Internet Attachment-based Compassion Therapy; WL, waiting list; EQ-5D, EuroQol 5D.

Figure 4 (a, b). Changes in well-being (PHI scores) in both conditions (iABCT and WL) at pre-assessment and 3-month follow-up.

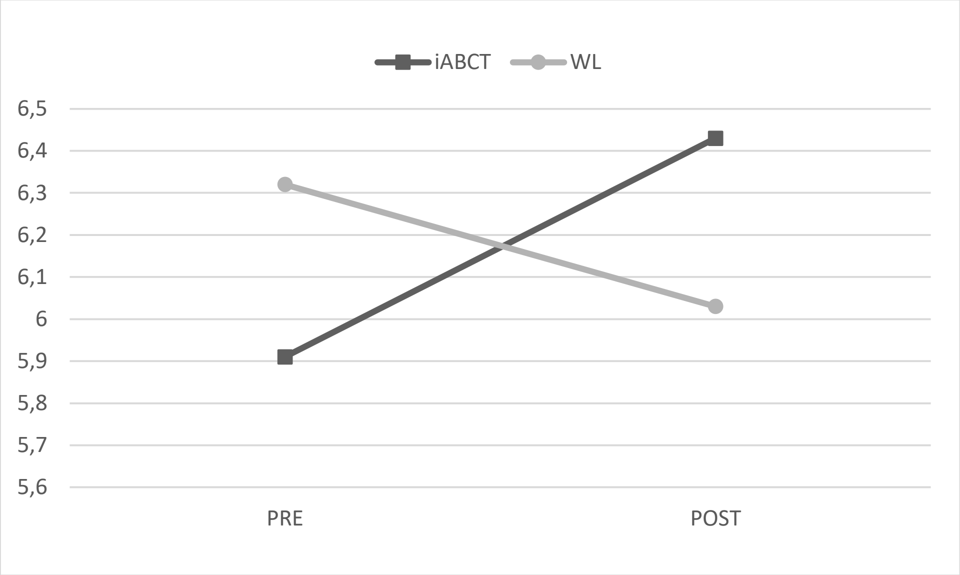


Fig. 4a. Changes in total well-being

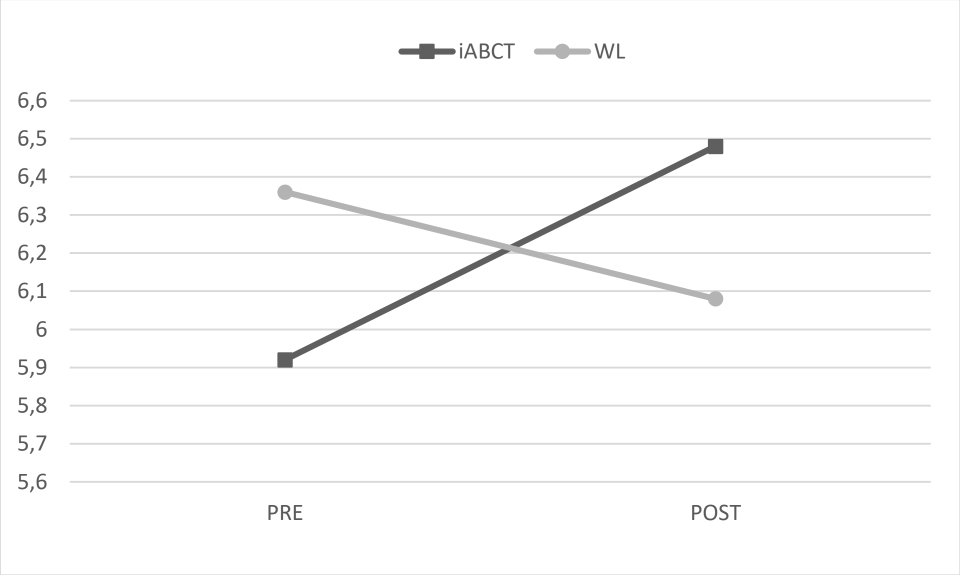


Fig. 4b. Changes in remembered well-being

Note. Pre, Pre-assessment; Post, 3-month follow-up; iABCT, Internet Attachment-based Compassion Therapy; WL, waiting list; PHI, Pemberton Happiness Index

3.3.2. Change in secondary outcomes at 3-month follow-up.

Compassion and self-compassion (SOCSS scores)

Regarding SOCSS, pretreatment scores on this measure were entered as a covariate to account for baseline differences.

Results showed a significant interaction effect in the SOCSS total score, $F(1, 59.95) = 4.90$, $p = .031$. Within-group comparisons revealed a significant increase on SOCSS total score for the iABCT condition at 3-month follow-up with a medium effect size (d=0.64), but no significant changes were found for the WL condition.

Between-group comparison did not reveal significant differences on SOCSS scores between the iABCT group and the WL group. However, participants from the iABCT condition showed higher levels of compassion compared to participants from WL group (see Table 7 for details).

Self-care behaviors (b-MSCS scores)

Results showed no significant condition x time interaction effect for any subscale of the b-MSCS. Within-group comparisons revealed significant pre- to 3-month follow-up increases in the ABCT for different self-care behaviors. Participants from the iABCT group show significant increases from baseline to 3-month follow up on self-compassion and purpose and supportive structure corresponding with medium effect sizes (d=0.60 and d=0.39 respectively). No significant changes were found in the WL condition for any subscale of the b-MSCS.

Between-group comparison did not reveal differences on b-MSCS scores between the iABCT group and the WL group (see Table 7 for details).

Self-criticism (SCRS scores)

Results for the SCRS showed a significant interaction effect in the SCRS total score, *F*(1, 61.16) = 6.76; *p* = 0.012. Within-group comparisons revealed a significant pre-to-3-month follow-up reductions on the total score of self-criticism for the iABCT, corresponding with a moderate effect size (*d*= 0.67), but no reduction was found in the WL condition.

For the total score of the SCRS, between-group comparisons did not reveal 3-month follow-up differences on self-criticism between the iABCT and the WL conditions (see Table 7).

Symptomatology (DASS-21 scores)

Results showed no significant condition x time interaction effect for any subscale of the DASS-21. Within-group comparisons revealed a significant pre- to 3-month follow-up reductions in both iABCT and WL conditions for the total score of the DASS-21, corresponding to a medium effect size (*d*=0.57) and a low effect size (*d*=0.43). Reductions for both groups on anxiety, depression and stress subscales show from low to medium effect sizes (see Table 7 for details).

Between-group comparison did not reveal differences on DASS-21 scores between the iABCT group and the WL group (see Table 7 for details).

Attachment styles (RQ scores)

For RQ results showed a significant interaction effect on secure attachment subscale, *F* (1, 66.43) = 7.15; *p* = 0.009, and preoccupied attachment subscale, *F* (1, 65.53) = 10,19; *p*= 0.002, from baseline to 3-month follow-up.

Within-group comparisons showed a significant increase at 3-month follow-up on secure attachment and significant reductions on preoccupied attachment and fearful attachment for the iABCT group corresponding to low and medium effect sizes (*d*=0.25; *d*=0.46 and *d*=0.44 respectively), but no significant change was found in the WL group. Between-group comparison revealed statistically significant differences at 3-month follow-up where the iABCT reported higher scores on secure attachment (*d*= 0.47) and lower scores on preoccupied attachment (*d*= 0.59) compared with the WL group (see table 7).

Social support (MOSS-S scores)

No significant condition x time interaction effect was found for any subscale of the MOSS-S (see table 7).

Between-group comparison did not reveal differences on MOSS-S scores between the iABCT group and the WL group at 3-month follow-up (see Table 7 for details).

Table 7. Means, standard deviations, within-group comparisons effect sizes and between group comparisons effect sizes at 3-month follow-up for secondary outcomes

Measure	Condition		M (SD)		Within-group effect size, *d* [95% CI]		3-month follow-up	
		Pre	FU (3M)	FU (6M)	Pre vs. 3M	Pre vs. 6M	Mean dif. iABCT vs. WL	Between-group effect size, d [95% CI]
Compassion and self-compassion								
SOCS-S								
SOCS Total score	iABCT	66.78 (11.60)	74.52 (11.20)	74.33 (13.07)	**0.66 [-0,38, -0,94]**	**0.64 [-0,42, -0,86]**	-0.65	0,07 [-0.47, 0.62]
	WL	73.67 (11.81)	73.58 (13.52)	75.27 (14.70)	-0.01, [0.16, -0.14]	0.13 [0.05, -0.32]		
Self-care behaviors								
B-MSCS								
Physical care	iABCT	2.79 (0.55)	2.66 (0.78)	2.79 (0.69)	-0.23 [0.52, -0.06]	0,00 [0.25, -0.25]	-0.10	-0.19 [-0.73, 0.35]
	WL	2.84 (0.52)	2.80 (0.63)	3.20 (0.59)	-0.08 [0.31, -0,16]	**0.68 [-0.38, -0.99]**		
Mindful relaxation	iABCT	2.27 (0.94)	2.44 (0.79)	2.31 (0.73)	0.18 [0.13, -0.49]	0.04 [0.30, -0.39]	-0.36	-0.33 [-0.88, 0.21]
	WL	2.58 (0.92)	2.77 (1.13)	2.73 (1.16)	0,20 [0.00, -0.41]	0.16 [0.08, -0.41]		
Self-compassion and purpose	iABCT	2.63 (1.06)	3.27 (0.89)	2.93 (0.96)	**0.60 [-0.24, -0.95]**	0.60 [-0.24, -0.95]	0.17	0.17 [-0.37, 0.71]
	WL	3.06 (1.15)	3.11 (0.94)	3.20 (1.31)	0.04 [0.17, -0.25]	0.12 [0.06, -0.30]		
Supportive relationships	iABCT	3.74 (1.05)	4.05 (0.94)	3.92 (1.00)	0.29 [-0.02, -0.56]	0.17 [0.16, -0.50]	0.43	0.49 [-0.06, 1.03]
	WL	3.59 (1.03)	3.54 (1.16)	3.89 (1.13)	0.05 [0.18, -0.08]	0.29 [-0.05, -0.53]		
Supportive structure	iABCT	3.16 (0.92)	3.52 (0.66)	3.58 (0.63)	**0.39 [-0.13, -0.64]**	0.39 [-0.13, -0.64]	0.03	0.18 [-0,36, 0.72]
	WL	3.35 (1.04)	3.38 (0.89)	3.43 (1.05)	0.03 [0.11, -0.17]	0.08 [0.10, -0.26]		
Mindfulness	iABCT	3.29 (1.15)	3.69 (1.02)	3.39 (1.04)	0,34 [-0,05, -0,64]	0.34 [-0.05, -0.64]	-0.03	0.02 [-0.52, 0.56]
	WL	3.66 (1.06)	3.67 (1.05)	3.67 (1.09)	0.01 [0.19, -0.20]	0.01 [0.23, -0.25]		
Self-criticism:								
SCRS								
SCRS Total score	iABCT	26.76 (7.68)	21.56 (8.90)	23.11 (10.98)	**-0.67 [0.94, 0.40]**	**-0.47 [0.66, 0.28]**	-1.45	-0.26 [-0.82, 0.29]
	WL	23.40 (8.12)	24.04 (9.53)	23.91 (11.75)	0.08 [0.02, -0.17]	0.06 [0.05, -0.17]		
Symptomatology:								
DASS-21								
Anxiety	iABCT	13.32 (11.13)	8.12 (8.72)	9.50 (10.71)	**-0.46 [0.71, 0.21]**	**-0.34 [0.52, 0.16]**	0.07	-0.03 [-0.58, 0.52]
	WL	12.48 (10.39)	8.38 (8.56)	8.73 (9.36)	**-0.39 [0.62, 0.16]**	-0.36 [0.64, 0,08]		
Depression	iABCT	18.14 (12.44)	11.75 (13.14)	11.83 (13.78)	**-0.51 [0.75, 0.26]**	**-0.50 [0.72, 0.28]**	0.42	0.08 [-0.48, 0.63]
	WL	16.05 (12.26)	10.88 (9.42)	10.81 (12.48)	**-0. 42 [0.62, 0.21]**	**-0.42 [0.66, 0.19]**		
Stress	iABCT	21.14 (10.22)	13.76 (10.51)	14.22 (11.02)	**-0.71 [0.98, 0.45]**	**-0.67 [0.92, 0.42]**	-0.49	-0.09 [-0.64, 0.46]
	WL	20.19 (10.42)	14.62 (7.97)	16.18 (11.88)	**-0.53 [0.79, 0.26]**	-0.38 [0.64, 0.11]		
DASS Total score	iABCT	52.59 (31.43)	34.42 (30.28)	35.56 (33.68)	**-0.57 [0.82, 0.32]**	**-0.54 [0.73, 0.34]**	0.42	-0.02 [-0.58, 0.54]
	WL	48.71 (30.41)	34.92 (23.80)	35.73 (29.55)	**-0.45 [0.67, 0.22]**	-0.42 [0.67, 0.17]		

*Note. d, Cohen's d; CI, Confidence Interval; Pre, Pre-assessment; FU (3M), 3-month follow-up; FU (6M), 6-month follow-up; iABCT, Internet Attachment-based Compassion Therapy; WL, waiting list; Mean dif., mean differences; SOCS-S = Sussex-Oxford Compassion for the Self Scale, B-MSC = Mindful Self-Care Scale - Brief version; SCRS = Self-critical rumination Scale, DASS-21 = Depression, Anxiety and Stress Scale; *p < 0.05.*

Table 7. Continuation

Measure	Condition	M (SD)			Within-group effect size, *d* [95% CI]		3-month follow-up	
		Pre	FU (3M)	FU (6M)	Pre vs. 3M	Pre Vs. 6M	Mean dif. iABCT vs. WL	Between-group effect size, *d* [95% CI]
Attachment styles:								
RQ								
Secure attachment	**iABCT**	4.56 (2.05)	5.08 (1.68)	3.61 (2.48)	**0.25 [-0.02, -0.48]**	-0.46 [0.83, 0.09]	1,07*	0,47 [-0.09, 1.02]
	WL	4.86 (1.89)	4.27 (1.73)	4.09 (2.12)	-0.31 [0.57, 0.05]	-0.40 [0.61, 0.19]		
Preoccupied attachment	**iABCT**	3.70 (2.21)	2.48 (2.12)	2.17 (2.20)	**-0.55 [0.83, 0.26]**	**-0.68 [0.97, 0.40]**	-1.28*	-0.59 [-1.15, -0.03]
	WL	3.19 (2.10)	3.69 (1.93)	2.36 (2.11)	0.24 [-0.03, -0.44]	-0.39 [0.71, 0.06]		
Dismissive attachment	**iABCT**	3.95 (1.80)	3.52 (1.92)	2.72 (2.30)	-0.24 [0.49, -0.02]	**-0.67 [0.95, 0.40]**	-0.11	-0.09 [-0.64, 0.46]
	WL	4.24 (1.75)	3.69 (1.85)	3.36 (1.75)	-0.31 [0.64, -0.02]	-0.50 [0.87, 0.12]		
Fearful attachment	**iABCT**	3.81 (2.20)	2.40 (2.00)	2.83 (2.43)	**-0.63 [0.91, 0.36]**	**-0.44 [0.68, 0.20]**	-0.36	-0.12 [-0.67, 0.43]
	WL	3.17 (2.13)	2.65 (2.02)	2.64 (2.62)	-0.24 [0.49, -0.01]	-0.25 [0.49, 0.00]		
Social support:								
MOS-SSS								
MOS-SSS Total score	**iABCT**	74.60 (17.05)	77.33 (16.16)	79.00 (18.33)	0,16 [0.06, -0.38]	0.25 [-0.05, -0.46]	6.16	0,32 [-0.24, 0.88]
	WL	73.67 (15.31)	71.96 (16.67)	76.55 (17.36)	-0.11 [0.25, -0.03]	0.19 [-0.03, -0.34]		

*Note. d, Cohen's d; CI, Confidence Interval; Pre, Pre-assessment; Post (3M), 3-month follow-up; FU (6M), 6-month follow-up; iABCT, Internet Attachment-based Compassion Therapy; WL, waiting list; Mean dif., Mean differences; RQ = Relationships Questionnaire, MOS-SSS = Medical Outcomes Study-Social Support Survey; *p < 0.05.*

3.4. Efficacy of the intervention at 6-month follow-up.

3.4.1. Maintenance of changes at 6-month follow-up for the iABCT condition

Regarding results on primary measures, a significant effect of time was find from baseline to 6-month follow-up on overall quality of life, *F* (2, 52.83) = 6,50, *p*= 0.003, and general health subscales of the EQ-5D, *F* (2, 56.41) 4.89, *p*= 0.011, but no significant changes were found for any subscale of the PHI. Within-group comparisons revealed a significant pre- to 6-month follow-up increases on overall quality of life and general health corresponding to medium and low effect sizes (d= 0.54 and d= 0.44 respectively) (see table 6).

Results on secondary measures revealed a significant effect of time at 6-month follow-up on compassion total score, *F* (2, 50.17) =7,61, *p*=0.001, self-criticism total score, *F* (2, 51.50) = 6.04, *p* = 0.004, overall symptomatology, *F* (2, 42.25) = 10.59, *p* < 0.001, and preoccupied *F* (2, 54.01) = 7.35, *p*= 0.002], fearful, *F* (2, 53.86) = 7.38, *p*= 0.001, and dismissive attachment, *F* (2, 53.91) = 3.70, *p*= 0.031. Within-group comparison showed significant increases on compassion total score with a medium effect size (*d*= 0.64) and significant pre to 6-month follow-up reductions on self-criticism were shown with low effect sizes (*d*= 0.47) (see table 7). Moreover, results show significant reductions in all subscales of the DASS corresponding to low effect size for anxiety (*d*= 0.34) and medium effect sizes for depression, stress and overall symptomatology (*d*=0.50, d= 0.67 and *d*= 0.54 respectively). Significant pre to 6-month reductions were also shown with medium and low effect sizes on dismissive attachment (*d*= 0.67) preoccupied attachment (*d*= 0.68) and fearful attachment (*d*= 0.44).

No significant pre- to 6-month follow-up changes were found on self-care behaviors (b-MSC scores) nor social support (MOSS-S scores).

3.4.2. Effectiveness of the intervention at 6-month follow-up for the WL group.

Regarding primary outcomes, results show no significant changes from baseline to 6-month follow up on quality or life (EQ-5D scores) or wellbeing (PHI scores) for the WL condition (see table 7 for more details).

Results on secondary outcomes show significant effect of time from baseline to 6-month follow up on the physical care subscale of the b-MSCS, $F(2, 52.21) = 3.25$, $p = 0.047$; and depression subscale of the DASS-21, $F(2, 39.96) = 7.77$, $p = 0.001$.

Within-group comparisons revealed a significant pre- to 6-month follow-up changes in WL group for the physical care subscale with a medium effect size ($d = 0.68$) and a significant reduction on depression symptomatology corresponding to medium effect size ($d = 0.67$). No significant changes were found in WL group at 6-month follow-up for any other secondary outcome (see table 7 for details).

3.5. Mediation analysis

3.5.1. Self-criticism and secure attachment as mediators: Is the effect of the condition on the 3-month follow-up wellbeing and quality of life scores mediated by changes on self-criticism and self(compassion)?

In the analysis of the self-criticism mediations models, there was a significant indirect effect of condition on well-being through changes on self-criticism, $b = 0.38$, $SE = 0.22$, 95% CI [0.04, 0.91], as bias-corrected bootstrap 95% confidence intervals (CI) for the indirect effects, based on 5.000 bootstrap samples, did not include the zero value (see Figure 5a). Neither the total effect, $b = 0.30$, $t = 0.59$, $p = 0.560$, nor the direct effect, $b = 0.16$, $t = -0.15$, $p = 0.885$, were significant for this model.

The indirect effects for the rest of the models were not significant, indicating that the change in self-criticism and (self)compassion (pre and 3-month follow-up SCRS and SOCS-s scores respectively) did not mediate the relationship between the condition and quality of life (EQ-5D 3-month follow-up scores). Neither the direct effects nor the total effects were significant in any of the models (see figures 5(b-c) and figure 6(a-c))

Thus, the results imply that the effect of the intervention on well-being is not direct, but is mediated by changes in self-criticism. However, self(compassion) do not appear as a mediator of the effect of the intervention neither on well-being (PHI scores) nor quality of life (EQ-5D scores).

Unstandardized regression coefficients, standard errors in parenthesis, and confidence intervals of the direct, total, and indirect effects are shown in Figure 5 (a-c) and Figure 6 (a-c).

Figure 5 (a-c): Simple mediation analyses exploring self-criticism as mediator

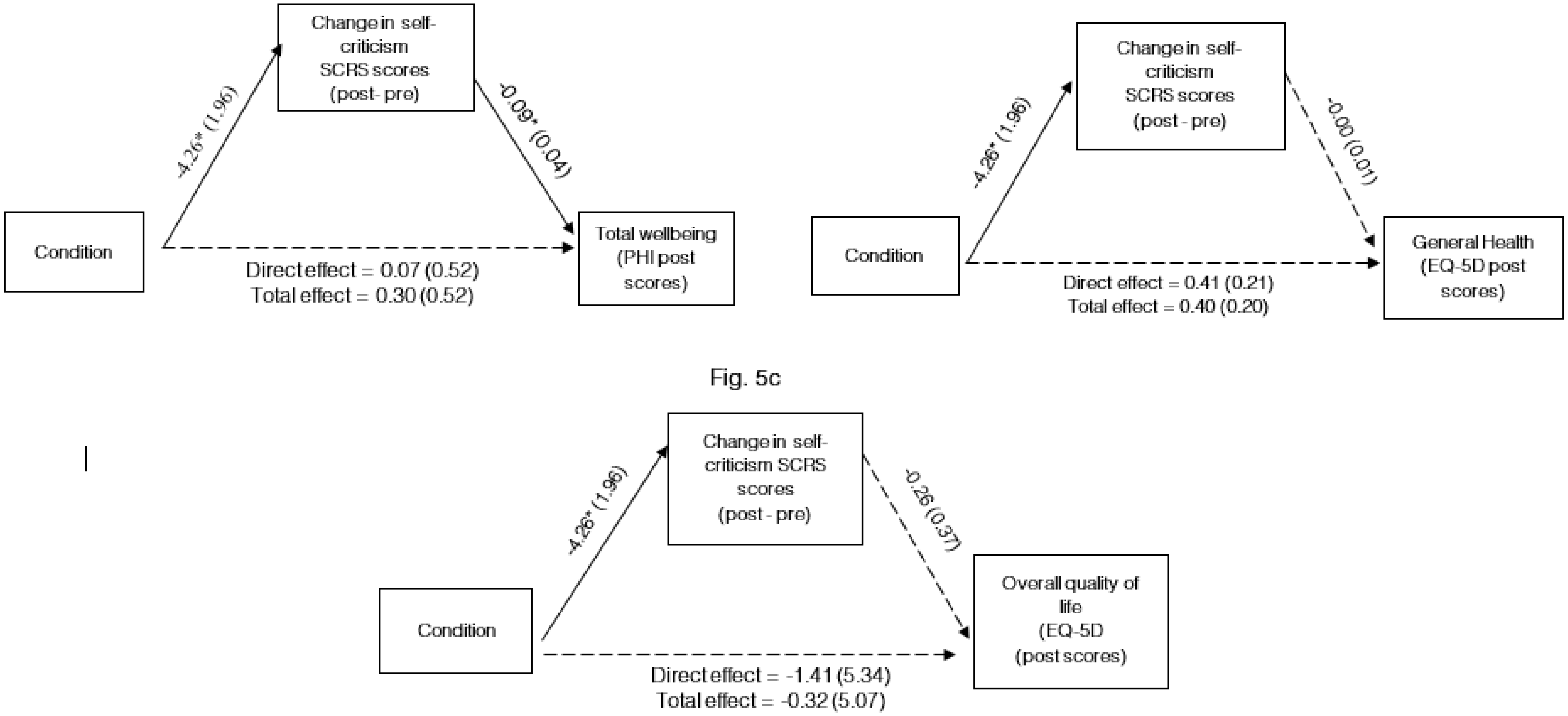


Fig. 5a

Fig. 5b

Fig. 5c

*Note. All coefficients represent unstandardized regression coefficients (standard errors in parenthesis); * p < .05; ** p < .01; *** p < .001; Pre, Pre-assessment; Post, 3-month follow-up; EQ-5D = EuroQol, PHI = Pemberton Happiness Index, SCRS = Self-critical rumination Scale*

Figure 6 (a-c): Simple mediation analyses exploring self(compassion) as mediator

Fig. 6a

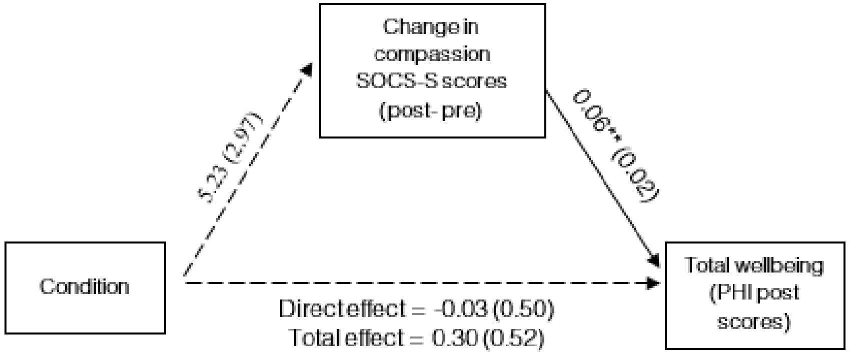


Fig. 6b

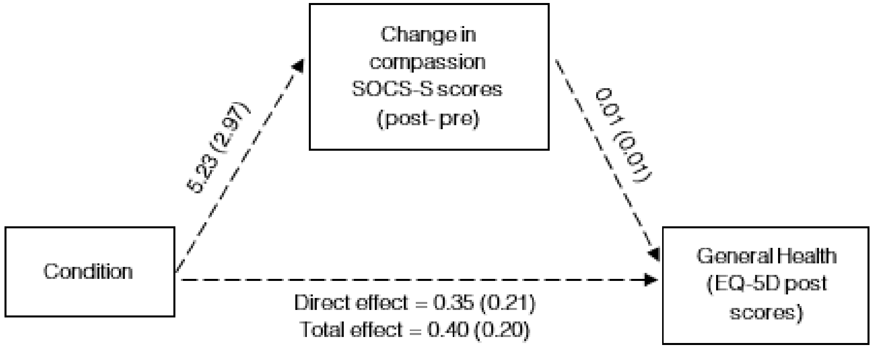
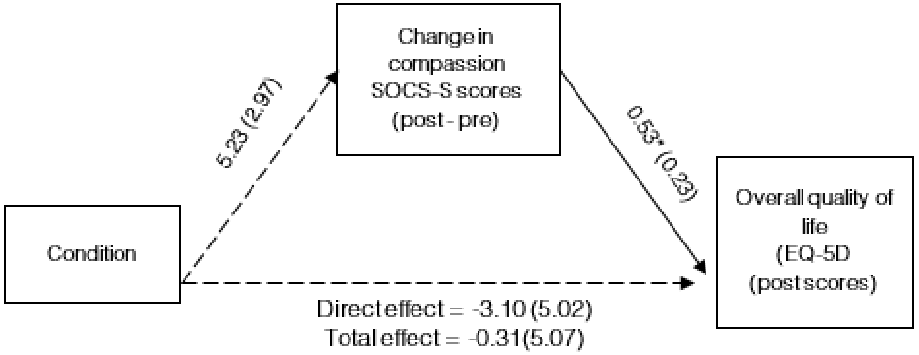


Fig. 6c



*Note. All coefficients represent unstandardized regression coefficients (standard errors in parenthesis); * p < .05; ** p < .01; *** p < .001; Pre, Pre-assessment; Post, 3-month follow-up; EQ-5D = EuroQol, PHI = Pemberton Happiness Index, SOCS-S = Sussex-Oxford Compassion for the Self Scale*

3.6. Satisfaction, usability and quality of the compassion practice.

In response to questions on satisfaction with the program, the majority of participants from the iABCT group show a high satisfaction with the program (*M*=26.06; *SD* = 5.74) after finishing it (at 3 months). Specifically, the majority of participants were satisfied with the quantity (*M* =3.47; *SD* =0.72) and quality (*M* =3.41; *SD* =0.71) of the services received, and they rated the program as helpful for solving their problems (*M*=2.35; *SD* = 0.93) and for dealing better with their problems (*M*=3.29; *SD* = 0.77), and they considered that the help received was what they expected (*M*=3.24; *SD* = 0.97). Moreover, participant's overall satisfaction with the program is high (*M*=3.53; *SD* = 0.80) and the majority of participants would use the program again in case they needed it (*M*=3.35; *SD* = 0.93) and they would recommend it to a friend (*M*=3.41; *SD* = 0.80).

Results of usability show that participants from the iABCT condition rated the program as functional and easy to use in overall terms (*M* =82.79; *SD* = 18.64). These results indicate that overall participants had a positive experience in terms of the program usability and acceptance of technology.

Regarding results on difficulties of compassion-based meditations, the majority of participants show a high quality of compassion practice referring to less difficulties on different key aspects of compassion practices such as mental imaginary or sense of connection and warmth (*M*=61.65; *SD* = 24.34).

Regarding the WL condition after giving access to the intervention and finishing it (at 6 months), the majority of participants show a high satisfaction with the program (*M*=24.14; *SD* = 2.19). The majority of participants were satisfied with the quantity (*M*=2.86; *SD* = 0.38) and quality (*M*=3.43; *SD* = 0.53) of services received, and they considered that the help received was what they expected (*M*=3.00; *SD* = 0.00). Participants from the WL condition rated the program as useful for solving their problems (*M*=2.14; SD = 0.38) and helpful for dealing better with their problems (*M*=3.29; *SD* = 0.49). Moreover, participant's overall satisfaction with the program is high (*M*=3.14; *SD* = 0.38) and the majority of participants would use the program again in case they needed it (*M*=3.14; *SD* = 0.69) and they would recommend it to a friend dealing with similar difficulties (*M*=3.14; *SD* = 0.69).

Similarly, participants from the WL condition rated results regarding usability show that participants from the WL condition rated the program as easy to use (M=78.33; *SD* = 21.83), which indicate that they found the program functional.

Finally, regarding quality of the compassion meditation practice, some difficulties were found by participants in the WL condition regarding aspect of the compassion meditations practice such as mental imaginary, sense of connection and warmth or compassionate phrases and gestures (*M*=49.71; *SD* =30.12).

3.7. Participant’s opinion: barriers and facilitators of an online CBI.

A total of 74 participants who drop-out from the study or decided not to participate were contacted to complete the semi-structured interview. Responses were completed by a total of 34 participants (21 of the non-participation group and 13 participants of the drop-out group).

Regarding barriers, frequency analyses revealed that the most frequent reasons to not participate in the study were not feeling motivated (n= 19, 90.5%), the presence of too many steps to access to the intervention (n= 14, 66.7%) or not being interested in the program (n= 13, 61.9%) or the scientific research (n= 12, 57.1%). Other reasons were related with missing the presence of a therapist (n= 9, 42.9%), not having enough time (n=9, 42.9%) or considering that the assessment part was too long or with too many questionnaires (n= 9, 42.9%). Other reasons mentioned by participants could be seen in Table 8.

On the other hand, results show that the most frequent reasons for dropping out from the intervention were related with needing the physical contact with a therapist (n= 12, 92.3%), need for more monitoring or support (n= 8, 61.5%), feeling that there were elements from the intervention that were too demanding, tiring or repetitive (n= 8, 61.5%), or feeling that the platform was not what they expected (n=7, 53.8%). Other less frequent mentioned reasons were that the platform was not likeable for them (n= 6, 46.2%), or that the program required too much time (n= 6, 46.2%) (see Table 9 for more details).

Table 8. Reasons for not participating

Reasons to not participate	N= 21	% sample
Improvement of emotional state	2	9.5
Missed the presence of a therapist	9	42.9
I did not feel motivated	19	90.5
I was not interested in the program	13	61.9
I was not interested in the science research	12	57.1
The platform was not what I expected	6	28.6
Problems with access	7	33.3
Preference for another electronic device (smartphone or tablet)	0	0
There were too many steps for accessing	14	66.7
The assessment was too long, with too many questionnaires	9	42.9
Some situation related with COVID-19	0	0
Other:		
Time	9	42.9

Regarding facilitators, improvements such as incrementing the presence of a therapist (79.4%), an easier and more attractive design (73.5%), a shorter program (55.9%) or having more interaction (55.9%), were the most frequent mentioned for both groups. Other important improvements were related to a more tailored and specific program (32.4% and 23.5% respectively) or including functionalities to interact with others (32.4%) (see Table 10 for more details).

Table 9. Reasons for dropping out of the treatment

Reasons for dropping out	N= 13	% sample
Improvement of emotional state	3	23.1
The program was not helping	1	7.7
The program was not what I expected	2	15.4
Need for physical contact with a therapist	12	92.3
Need for more monitoring	8	61.5
Need for greater restraint	0	0
I did not feel motivated	3	23.1
I was not interested in the program	0	0
The platform was not what I expected	7	53.8
The platform format was not likeable to me	6	46.2
Problems with access	1	7.7
Preference for another electronic device (smartphone or tablet)	2	15.4
The program was difficult to adapt to daily life.	2	15.4
Too much time	6	46.2
There were elements too demanding, tiring or repetitive (e.g. questionnaires, exercises or practices)	8	61.5
The program was too long	2	15.4
Some situation related with COVID-19	0	0
Other:		
Not being constant and tendency to not finish what I started	1	7.7

Table 10. Facilitators of CBIs

Facilitators of CBI	N= 34	% sample
A shorter program (brief)	15	55.9
Different design (easier and attractive)	25	73.5
Different format (e.g. app for smartphone)	3	8.8
Tailored program	11	32.4
A more specific and targeted program for my problem	8	23.5
More presence of a therapist	27	79.4
Completely face-to-face intervention	3	8.8
More interaction	15	55.9
Functionalities to interact (e.g. chats, forums)	11	32.4
Other:		
technical problems	2	5.9

3.7.1. Qualitative analyses of participant's opinions on improvements and missed aspects of the program.

Results from the qualitative thematic analysis were organized into four domains including: support, program improvements, aspects of initial assessment and access, and platform and web facilitators. A total of 15 categories are included into the domains (see table 11 for details).

Support:

This domain refers to the participant's wish of establishing contact with some therapist or interacting with other peers that could help them and support them along the intervention. A total of 4 categories related to the support emerged from the analysis: therapist support, support not specified, support from other peers and support from guides. Improvements included in this domain were the most mentioned by participants, representing a 29.75% of the total. Specifically, support from therapist was the most mentioned improvement within the domain (47.2%), followed by no specified support (30,5%), support from other peers (16.67%), and support from a guide (5.56%).

Program:

This domain contains participant's perceived improvements regarding the different characteristics of the iABCT program such as the content or the amount of information among others. Comments from participant's regarding characteristics of the program were classified into 4 categories: personalization, length, difficulty level and dynamism. Most comments were made in relation to the length of the program (40.63%), referring to the wish of participants of a shorter program. Other aspects mentioned by participants referred to a more personalized and adapted program (21.88%), and an easier (18.75%) and more dynamic program (18.75%).

Aspects of initial assessments and access:

Aspects mentioned in this domain were related to participant's opinion of the different assessments and the procedure to access to the web platform and start with the intervention. Three categories were included in this domain containing comments regarding participant's wish for shorter assessments (33.33%), a reduced number of assessments (22.22%) and less steps to access to the platform and start with the intervention (44.44%).

Web platform:

This domain was characterized by participant's comments on different web platform features (i.e. website design) or different aspects regarding technology. A total of 4 categories related to the web platform emerged from the analysis: intuitive web (28.57%), technical aspects (20%), accessibility (11.43%) and system design (40%). Most of participant's desires mentioned a more attractive and user-friendly web platform.

Table 11: Domains, categories and examples of the qualitative thematic analysis

Domain	Category	Example	Nº of units	% of the domain	% total
Support and interaction	No specified human support	*"More support and interaction"* *"Someone that could help me and support me"*	11	30.5%	29.75%
	Therapist	*"Increased therapist presence or include sessions in which a therapist is present"* *"I missed the help or support of a professional"*	17	47.2%	
	Other peers	*"To be able to talk to other people"* *"I wish I could have talked to other patients"*	6	16.67%	
	Guide	*"Some lessons via zoom or similar to increase commitment and involvement"* *"Guidance to understand some aspects of the program"*	2	5.56%	
Program	Personalization	*"A more personalized program adapted to my disease"* *"More personalization. I felt that the program was not adapted to my condition".*	7	21.88%	26.45%
	Length	*"A shorter program, with less modules"* *"The program seemed very long, I couldn't find the time to accommodate it"*	13	40.63%	
	Difficulty level	*"An easier program"* *"The program was quite complicated and tedious at certain points"*	6	18.75%	
	Dynamism	*"A more dynamic and motivating program"* *"The program was repetitive and boring"*	6	18.75%	
Aspects of initial assessments and access	Shorter assessments	*"The assessments were very long"* *"Fewer or at least shorter questionnaires"*	6	33.33%	14.88%
	Number of assessments	*"Reduced number of questionnaires"* *"Fewer assessments"*	4	22.22%	
	Less steps to start	*"Reduce tasks to be performed before the intervention"* *"There were too many steps to access"*	8	44.44%	
Web platform	Intuitive web	*"A more user-friendly website"* *"A more intuitive web platform"*	10	28.57%	28.93%
	Technical aspects	*"The program did not allow access, there were a lot of errors".* *"The website did not run properly"*	7	20%	
	Accessibility	*"Easier access"* *"Better access to the platform"*	4	11.43%	
	System design	*"I found the format of the website a bit old-fashioned and not very attractive"* *"A more visually appealing platform"*	14	40%	

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CHAPTER THREE

GENERAL DISCUSSION

CHAPTER 3. General discussion

The general objective of this dissertation was to analyze the efficacy of a CBI delivered online (iABCT) to improve the quality of life and well-being in a population with chronic medical conditions compared to a waiting list control group.

The specific objectives of this study were:

1. To analyze the efficacy of the iABCT program in increasing quality of life and well-being and at 3-month follow-up after baseline compared to the WL group.
2. To analyze the efficacy of the iABCT intervention in increasing other secondary outcomes such as (self)compassion, self-care behaviors, self-criticism, symptomatology, attachment styles and social support.
3. To analyze data on the maintenance of the achievements in the intervention group and analyze the efficacy of the iACBT for the WL group at 6-month follow-up.
4. To analyze the acceptability of the iABCT program in terms of expectations, satisfaction, usability and opinion by the participants
5. To analyze if self-criticism and (self)compassion mediate the effect of the condition on the improvement on quality of life and well-being at 3-months follow-up.
6. To identify possible facilitators and barriers to the use of this intervention (e.g., treatment logic, duration, format, usability) taking into account the participant's perspective through a semi-structured qualitative interview.

1. Efficacy of the iABCT in a population with chronic medical conditions

1.1. Efficacy of the iABCT on primary outcomes: quality of life and well-being

The first hypothesis of this dissertation proposed that participants from the iABCT condition would show significant increases on quality of life and well-being at 3-month follow-up in comparison with the WL group. In this regard, results showed that the iABCT group significantly increased both quality of life and well-being scores with medium and low effects sizes. Moreover, significant differences between two conditions were found at 3-month follow-up on overall quality of life with medium effect sizes, indicating that the iABCT show higher scores on quality of life than the WL condition. Even though differences on well-being between conditions were not significant, participants from the iABCT condition scored higher than participants from WL condition at 3-month follow-up. Therefore, the first hypothesis was partially confirmed.

These data are in line with those obtained in previous studies that confirm the effectiveness of the CBIs for improving the quality of life and well-being in chronic medical illness populations (e.g. Montero-Marin et al., 2018; Penlington, 2019). For instance, Montero-Marin and colleagues (2018) concluded that the ABCT was more effective than relaxation in improving quality of life in patients with fybromialgia with high effect sizes (d= 0.84). Our results are also consistent with the conclusions reported by review studies and meta-analysis on the efficacy of CBIs for the intervention on chronic medical conditions (Austin et al., 2021; Kiliç et al., 2021).

Finally, our results are also consistent with those obtained in studies on the use of the Internet for the treatment of medical clinical conditions concluding that CBIs delivered online may be an alternative to traditional face-to-face interventions among persons with chronic health conditions for improving health outcomes and quality of life (Bendig et al., 2018; Mehta et al., 2019; White et al., 2022).

1.2. Efficacy of the iABCT on secondary outcomes: (self)compassion, self-criticism, attachment styles, self-care behaviors, symptomatology and social support.

The second hypothesis stated that participants from the iABCT group would show significant increases on (self)compassion, self-care behaviors, secure attachment style and social support; and significant reductions on self-criticism, symptomatology and preoccupied, dismissive and fearful attachment styles at 3-month follow up in comparison with participants from the WL condition. This hypothesis was partially confirmed since some significant changes followed the expected direction but no significant results were found on other outcomes. A review of these results are presented below:

(Self)compassion and self-criticism

Results indicated that participants from the iABCT group showed significant increases on (self)compassion and significant decreases on self-criticism at 3-month follow-up with medium effect sizes in comparison with participants from de WL condition (who did not show any significant change). Moreover, even though differences between conditions did not reach statistical significance at 3-months follow-up, participants from the iABCT group scored higher on compassion and lower on self-criticism than participants from the WL.

These results agree with other studies showing the effectiveness of different CBIs on improving compassion and self-compassion (e.g. Germer & Neff, 2013; or Jazaieri, et al., 2013) and decreasing self-criticism (e.g. Beaumont et al., 2016; Shahar et al., 2015). Results from our study also support similar findings from systematic reviews and meta-analysis (Wakelin et al 2022; Kirby et al., 2017)

Finally, these results are also in accordance with studies showing the effectiveness of CBIs delivered online for reducing self-criticism and increasing (self)compassion (e.g. Krieger et al., 2019; Finlay-Jones et al., 2017).

Self-care-behaviors

Results on self-care behaviors indicated that participants from the iABCT group increased they scores at 3-month follow-up on different self-care behaviors such as self-compassion and purpose and supportive structure with medium effect sizes. No improvements were shown for the WL condition. Nevertheless, the iABCT group did not show significant changes in any other self-care behavior and the difference between conditions at 3-month follow-up did not reach statistical significance. Hence, results regarding this outcome should be viewed with caution.

Our results show a tendency in the same line that other studies supporting a positive association between self(compassion) and different self-care behaviors such as eating habits, exercise, sleep behaviors or others health promoting behaviors (Sirois et al., 2015; Phillips & Hine, 2021). However, the majority of studies are correlational and present a great variability in their design, measures, the target population and the specific self-care behavior they choose as the outcome (Biber & Ellis, 2017; Phillips & Hine, 2021). Therefore, research on CBIs in the context of chronic medical conditions may benefit from future evidence exploring the effect of training compassion on different self-care responses among individuals suffering from chronic medical conditions.

Symptomatology

Results from this study show improvements over time on symptomatology (depression, anxiety and stress) for both iABCT condition and WL group and no significant differences were found between conditions at 3-month follow-up. Specifically, a reduction on depression, anxiety and stress symptomatology was found for both the iABCT and the WL conditions.

These findings did not match with what was expected, since participants from the WL group reduces their symptomatology during their waiting time. In this line, evidence from a few studies has also found improvements in the WL condition during their time waiting for an intervention (Elliot & Brown, 2002; Shahar et al., 2015; Zernicke et al., 2012). For instance, results from a meta-analysis exploring the effect of waiting on a population suffering from tinnitus conclude that participants improve their tinnitus distress over a short waiting phase (Hesser et al., 2011). In this line different studies have highlighted the importance of exploring results also for the waiting list conditions and how those could influence intervention effects (e.g. Cunningham et al., 2013; Furukawa et al., 2014).

Attachment styles

Results on attachment styles follow the pattern expected in hypothesis 2 since significant increases were shown in secure attachment with low effect sizes and significant decreases were shown in preoccupied attachment and fearful attachment with medium effect sizes for participants in the ABCT group compared to participants in the WL condition. Moreover, significant differences between conditions were found at 3-month follow-up on secure and preoccupied attachment with medium effect sizes, indicating that participants from the iABCT group showed higher secure attachment and lower preoccupied attachment than participants from the WL condition.

The relationship between attachment styles and (self)compassion has been explored in different studies founding similar results. A recent systematic review carried out by Amari and colleagues (2022) concluded that all of these studies appeared to corroborate the evolutionary theoretical link between a developed soothing system, secure attachment and (self)compassion and the activation of a threat system with insecure attachment (Gilbert, 2020; Naismith et al., 2019). However, almost all the studies were cross-sectional and fewer studies explore the effect of a CBI on increasing secure attachment style and decreasing insecure attachment styles (Amari et al., 2022). In this sense, our results are in line with the study carried out by Navarro-Gil and colleagues (2020), which found that the attachment-based compassion therapy significantly increased secure attachment and reduce preoccupied and dismissive attachment in a healthy population (Navarro-Gil et al., 2020).

Social-support

Regarding results on social support, no significant change was found for the iABCT condition at the 3-month follow-up and no differences between conditions reach statistical significance at the 3-month follow-up. Thus, our results from the study are not in line with what we expected.

Theoretically, (self)compassion has been conceptualized as a social mentality in which the interpersonal mentalities of care-seeking and caregiving are activated (Gilbert, 2019; Hermanto & Zuroff, 2016). Moreover, common humanity has been considered as a component of self-compassion that promotes having a more interconnected and less separate view of the self (Barnard & Curry, 2011; Neff, 2003).

In this sense, results from different studies show that (self)compassion is associated with different aspects related to social support such as perceiving more social connectedness (Neff et al., 2007), perceiving availability of social support (Neely et al 2009) or promoting care-seeking behaviors (Hermanto & Zuroff, 2016).

However, once again, there are only few studies exploring the relationship between social support and self(compassion) in the context of chronic medical conditions (e.g.

Brion et al.,2014). To our knowledge, no study has explored the effect of a CBI on social support and future research should investigate how training compassion may affect social support in this context.

1.3. Efficacy of the iABCT at 6-month follow-up

The third hypothesis stated that the increases achieved after receiving the intervention would be maintained at 6-month follow-up for the iABCT condition.

Following our results, this hypothesis was partially confirmed since some improvements were maintained at 6-month follow-up, but no significant changes were found in other variables. In this sense, results show that significant increases in quality of life and (self)compassion were maintained until 6-month follow-up with low and medium effect sizes and significant reductions in self-criticism, symptomatology and dismissive, preoccupied and fearful attachment styles were maintained with low and medium effect sizes. However, no significant results were found for well-being, self-care behaviors nor social support.

Our fourth hypothesis proposed that participants in WL group would show an increased quality of life and well-being and other secondary variables at a 6-month follow-up, once they receive the iABCT. Results from this study did not match with what it was expected since only a significant change from baseline to 6-month follow-up was found on physical care and depression symptomatology with medium effect sizes, but no significant improvements were found on any primary or other secondary variables.

In this work, some factors might explain these results. First, we would like to highlight that these results may be affected by the high dropout rate presented at 6-month follow-up (especially for the WL condition, that supposes a 53.85% of participants). Moreover, as mentioned in previous sections, the waiting time for an intervention could influence the intervention's effectiveness and attrition (Cunningham et al., 2013; Fukurawa et al., 2014). For example, Akl and colleagues (2012) found in a systematic review exploring the impact on treatment effects of information lost to follow-up in RCTs that a higher percentage of participants lost to follow-up was associated with a longer length of follow-up time.

Second, long-term changes on individuals with chronic medical conditions may be more difficult to achieve due to the particularities of this population. For example, it is worth mentioning the impact that high rates of comorbidity or the passage of time and age can have on functional limitations on the daily life of these individuals (Qin, 2022; Rector et al., 2020).

Therefore, exploring factors associated with dropout rates in follow-ups and investigating the long-term impact of different characteristics of patients with medical conditions may be convenient to strengthen the robustness of follow-up results.

1.4. Summary of findings on the efficacy of the iABCT

Based on the results obtained in the present study, we can conclude that the iABCT may be an effective intervention for increasing the quality of life and well-being until 3-month on a chronic medical condition population. Furthermore, the iABCT has proven its efficacy on increasing (self)compassion and secure attachment and reducing self-criticism and preoccupied and fearful attachment until the 3-months for people suffering from a chronic medical condition.

As mentioned, these results are in concordance with similar results found on different systematic reviews and meta-analyses and support the beneficial effect that a CBI could have on improving quality of life and well-being in people suffering from chronic medical conditions (Austin et al., 2021; Hughes et al., 2021; Kiliç et al., 2021). Moreover, our study reinforces the existing evidence on using IBIs in the context of chronic medical conditions (Bendig et al., 2018; Elbert et al., 2014; White et al., 2022) and the benefits that could be derived from adapting a CBI to a web-based program delivered online in this context (Carvalho et al., 2022; Karekla et al., 2019).

However, the lack of statistically significant differences between conditions in addition to the results in the significant within-group effect sizes could reflect insufficient statistical power for some outcomes (e.g. well-being, self-compassion, or self-criticism). To explain this issue, we would like to highlight the effect of sample sizes on statistically significant differences. In this sense, statically significant results with p-values are directly dependent of samples sizes, whereas the effect sizes are a measure of the strength of a phenomenon and do not directly dependent on the sample sizes (Gerber & Malhotra, 2008; Kühberger et al., 2014). Future studies could confirm if statistical differences on these outcomes can be found in larger samples and thus helping the generalization of findings.

Similarly, even though results on maintenance of changes indicate a tendency in the expected direction, results from 6-month follo-up should be considered with caution due to the high drop-out rates. Likewise, more evidence with larger samples and research on factors that influence drop-out rates is needed to replicate and help to generalize these results.

2. Satisfaction and usability of the iABCT

The fifth hypothesis of this study stated that the iACBT would be well accepted in terms of expectations, satisfaction, usability and opinion by the participants.

This hypothesis is confirmed because results from the satisfaction and usability measures indicate that overall participants from both conditions were satisfied with the program after finishing it. Overall participants from both conditions found the program functional and easy to use, and they showed high levels of satisfaction with the intervention received (in terms of quality and quantity of the service received, finding the program helpful for their problems or receiving the help that they expected).

Regarding the quality of compassion meditation practice, participants from the iABCT showed a high quality of compassion practice whereas participants from the WL condition found some difficulties on aspects of compassion meditation practices (e.g. mental imaginary ability or generating a sense of connection and warmth).

These results are in accordance with different recent evidence indicating that CBIs are considered useful and satisfactory interventions for individuals suffering from chronic diseases (Austin et al., 2021; Brooker et al., 2020; Guiomar et al., 2022) and support the evidence on acceptability of online interventions in this context (Cuijpers et al., 2008).

3. Self-criticism and (self)compassion as mediator variables

The sixth hypothesis proposed that changes in self-criticism and (self)compassion would appear as mediators of greatest changes in quality of life and well-being. This hypothesis was partially confirmed as the effect of condition on well-being was mediated by the change in self-criticism. Nonetheless, no mediation effect of self-criticism was found for quality of life and changes in self-compassion did not mediated any change in quality of life nor well-being.

These results indicate that changes in well-being in the iABCT group versus the WL group were significantly mediated by improvements in self-criticism. Thus, it seems that reductions in self-criticism mediated the effectiveness of the iABCT in increasing well-being in a population of chronic medical conditions.

Thus far, to our knowledge only one study carried out by Sommers-Spijkerman and colleagues (2018) has explored the pathways for which a CBI works, finding similar results in a population with low to moderate levels of well-being. In this study, authors concluded that the compassion-focused therapy (CFT) operates through different mechanisms such as cultivating self-reassurance, reducing self-criticism and regulating positive and negative affect (Sommers-Spijkerman et al., 2018). Moreover, they found that self-criticism and the facet of self-compassion (self-reassurance) did not have the same importance as working mechanisms, being self-criticism the least important. In this sense, authors hypothesized that while compassion might have a more important role in subclinical populations, self-criticism might have a more vital role in clinical samples. This hypothesis is in accordance with our findings since self-criticism (but not self-compassion) appears to be a significant mediator of changes in well-being in a population with chronic medical conditions.

These findings altogether add empirical evidence to Gilbert's affect regulation systems theory since they suggest that CBIs might work through the activation of the soothing system in subclinical and healthy populations whereas in clinical populations it might work through the deactivation of the (hyper-aroused) threat system (Gilbert, 2014).

Therefore, our study adds promising findings on the mechanism underlying the effectiveness of CBIs but research on this issue is still in the early stages and there is a need for more research in this area applying more rigorous designs to replicate these findings or to explore other active ingredients of CBIs on different contexts (Kirby et al., 2017; Sommers-Spijkerman et al., 2018).

4. Participant's opinion: Reasons for dropping out and not participating on an online CBI and facilitators of these programs.

Attrition rates in Internet-based interventions for chronic health conditions are usually high, supposing a problem to analyzing the effectiveness of these programs in this context. In this line, a great heterogeneity on drop-out rates, which ranged from 2% to 63%, was found in a systematic review carried out by Cuijpers and colleagues (2008) on internet-administered CBT programs for health problems. Similarly, Meyerowitz-Katz and colleagues (2020), concluded in a recent systematic review and meta-analysis that drop-out rates in trials of app-based interventions for chronic diseases was 43% in average.

Considering this evidence, qualitative studies exploring participant's opinions regarding the treatment or exploring reasons for dropping out could be enormously relevant in the context of chronic conditions in order to prevent high rates of attrition. However, thus far no studies have explored using qualitative methodology barriers and facilitators of a CBI delivered online for individuals with chronic medical conditions. For this reason, one objective of this work was to explore participant's opinions regarding reasons for dropping out or not participating in the iABCT along with improvements they considered a CBI should have.

In this regard, results from our quantitative analysis exploring reasons for dropping out and not participating in the iABCT indicated that most mentioned reasons for not participate were related to not feeling motivated, the presence of too many steps to access or not being interested in scientific research. However, reasons for dropping out were slightly different, since participants highlighted aspects such as needing physical contact with a therapist, more monitoring or support, and reasons related to the characteristics of the program (i.e. they perceived the intervention as too demanding or the platform did not match their expectations).

Facilitators or improvements mentioned by participants were related to including the support from a therapist, an easier, shorter and more attractive program and having more interaction along the intervention.

Similar results were found in the qualitative thematic analysis of participant's opinions on improvements and missed aspects of the program, which resulted in four domains: support, program improvements, aspects of initial assessment and access, and platform and web facilitators. In this sense, participants mentioned as important improvements related to receiving some kind of support (especially from a therapist), and other preferences related with the program and platform (i.e. a shorter and more tailored program with a more attractive design) and preferences regarding access to the platform (i.e. fewer steps to access to the platform and a shorter and less number of assessments).

These results are in line with some studies exploring which characteristics should be present on IBIs to improve adherence in individuals with chronic health problems. For instance, Karekla and colleagues (2019) concluded in a review analyzing best practices for digital interventions that including human support, tailoring the interventions according to user characteristics or improving program and platform characteristics (i.e. providing technical assistance or including simple and direct instructions for use) were aspects recommended to improve adherence and engagement in chronic illnesses sufferers. Similarly, motivation is another factor that has been considered important for increasing engagement in individuals with chronic medical conditions (especially at the beginning of an intervention) (Danielson et al., 2019).

In the same line, digital interventions including some form of human support have been associated with more engagement (Palmqvist et al., 2007) and with greater efficacy and lower drop-out rates (e.g., Baumesiter et al., 2014; Richards & Richardson, 2012).

Similar results are also found on different studies exploring participant's opinions on CBIs delivered online. For example, Deacon and colleagues (2021) explored participant's experiences of developing self-compassion through an online training and identified the lack of personalized support as a barrier to training self-compassion and tailoring the training to participants' own needs as a facilitator of developing self-compassion.

In conclusion, even though there are a few studies exploring qualitatively participant's opinions on different compassion-based programs (see Austin et al., 2021, for a review), evidence on this matter it's still scarce and no studies have explored reasons for dropping out from a CBI delivered online in the context of chronic medical conditions. In this sense, studies exploring reasons for dropping out from online CBIs could help to improve tailoring interventions according to participants' needs and improve adherence and prevent high rates of attrition in this context.

5. Limitations

This study has also limitations that are worth to mention. Although some limitations of this work have been briefly discussed in previous sections, some general limitations of this dissertation can be pointed out.

First, we used a waitlist control design rather than an active control intervention. Whereas there are ethical advantages to a waitlist design because it allows for the provision of care to individuals who need it while permitting a no-treatment assessment, such design may have some effects on interventions results. For instance, one study concluded that the waitlist design caused an overestimation of intervention effects (Cunningham et al., 2013). Similarly, other study concluded that using different control conditions may lead to substantively different treatment effect estimates and that the waitlist condition could be regarded as a nocebo condition since it was inferior to no-treatment condition (Furukawa et al., 2014). Therefore, studies should explore the influence of waiting list conditions on intervention results and pay more attention to the differences in the control conditions in future research (Fukurawa et al., 2014).

Second, we have not analyze the cost-effectiveness of the iABCT. Considering that these illnesses suppose a great burden in terms of socioeconomic costs and healthcare budget worldwide (Centers for Disease Control & Prevention, 2009; WHO, 2019), studies analyzing cost-effectiveness of CBIs are necessary to explore if these interventions are not only effective but also efficient for the healthcare systems and society in general.

Third, high dropout rates (especially at 6-month follow-up) should be taken into account for interpreting our results since they could have affected the statistical power, and therefore the rest of the analyses of the present study. In order to address this problem, we included the qualitative analysis exploring reasons of dropping out, which gave us information about participants' opinions about the treatment and possible ways to reduce drop-out rates and improving CBIs delivered online in future studies.

Four, information regarding illness interference was not possible to analyze due to the heterogeneity of the sample and the unbalanced number of participants per group of types of chronic condition. For the same reason, comparison between types of chronic conditions was neither possible. Some studies have found how illness interference could be an outcome affected after receiving a CBI. For example, Montero-Marin and colleagues (2018), found in an RCT that impact of fibromyalgia was reduced after receiving the Attachment-Based Compassion therapy in a sample of patients with fibromyalgia. Hence, studies analyzing illness interference may be beneficial for understanding the efficacy of CBIs in reducing the impact that the chronic disease has on patients' daily life.

Fifth, even though a transdiagnostic approach has been considered a beneficial approach to illnesses with high rates of comorbidity and commonalities, such design also presents some disadvantages. For instance, this approach makes it difficult to tailor the intervention to diagnosis-specific needs and there is also a danger of ignoring the important difference between diagnoses, which could be important targets for the intervention (Craske, 2012; Mansell et al., 2009). Hence, future research could explore the characteristics of patients or conditions that are most likely to benefit from a transdiagnostic approach (Brassignton et al., 2018).

Finally, a comparison between iABCT group and WL condition was not possible at 6-month follow-up because WL was provided with the intervention at 3 months due to ethical reasons. For that reason, results of maintenance and generalization at 6-month follow-up should be viewed with caution.

6. Future directions

Findings from the present study are promising and lead us to new research questions which guide several future directions for this work.

Our analysis exploring participants' opinions and reasons for dropping out gave us different insights on how CBIs delivered via Internet could be improved to prevent high rates of attrition and improve adherence.

First, the inclusion of some kind of support, especially human contact with a therapist, could help improve adherence to this intervention. Thus far, it has been shown that digital interventions including some form of human support have been associated with more engagement (Palmqvist et al., 2007) and with greater efficacy and lower drop-out rates (e.g., Baumesiter et al., 2014; Richards & Richardson, 2021). Future research could explore other types of support (e.g., peer support, blended interventions, facilities to interact) to analyze whether there is greater adherence to CBIs, especially in the context of chronic medical conditions.

Second, tailoring interventions to participants' own needs has been considered an important characteristic that could also improve adherence to CBIs. While there are many commonalities across living with different illnesses, some features are more specific and demand more tailored interventions (Brassignton et al., 2016). In this sense, further studies could include tailored interventions targeted at the characteristics, needs, and preferences of patients with chronic medical conditions (Deacon et al., 2021).

Third, further research is also needed to explore how different characteristics of platforms and programs (e.g. briefer interventions and assessments, a more attractive platform design, or a more user-friendly program) could impact on adherence to online CBIs in individuals suffering from chronic illnesses.

On the other hand, this dissertation also helped to answer some questions regarding mechanisms underlying the effectiveness of CBIs. However, much more is still unknown and further research is needed.

In this line, additional studies are needed to replicate and build on our initial and previous findings on mechanisms underlying the efficacy of CBIs (see Sommers-Spijkerman et al., 2018). Further research designed to measure both mediators and outcomes at multiple intervals over the course of the intervention and more rigorous research exploring other active ingredients of CBIs in different contexts is recommended to refine current CBIs, optimize their effectiveness and tailor it for different target groups (Kirby et al., 2017; Kraemer et al., 2002; Sommers-Spijkerman et al., 2018). In the same vein, moderation analyses of different clinical and sociodemographic characteristics of individuals suffering from chronic medical illnesses (e.g. age, gender, type of chronic illness, comorbidities, etc.) may be interesting to shed light on the personalization of interventions in order to establish which intervention target is the most optimal in each case and for whom it is best.

Another line of future studies should rely on research exploring the cost-effectiveness of these interventions. In this sense, D'Amico and colleagues (2020) in a pilot study showed promising results on the cost-utility of the ABCT in individuals with fibromyalgia but more research with more robust designs is needed in order to replicate this incipient evidence and to prove the efficiency of adapting this CBIs to an online format (Austin et al., 2021; D'amico et al., 2020). Moreover, future studies exploring the implementation of online CBIs in public health systems may be interesting to further explore if these interventions may have an impact on reducing the burden of these diseases in terms of socioeconomic costs and healthcare budget.

7. Conclusions

This is the first study in Spain to analyze the efficacy of Internet attachment-based compassion therapy for improving quality of life and well-being in a chronic medical conditions population. Furthermore, this work is the first attempt of exploring reasons for dropping out from a CBI delivered online in the context of chronic medical conditions and provides promising results on mechanisms underlying the effectiveness of CBIs.

The main findings regarding the objectives of this dissertation are presented in the following points:

- Our results support the use of Internet attachment-based compassion therapy to increase quality of life and well-being in individuals with chronic medical illnesses.
- Our study adds promising findings of the effect of the iABCT on other outcomes such as self(compassion), self-criticism and attachment styles.
- Maintenance of changes on quality of life, self(compassion), self-criticism, attachment styles and symptomatology show a tendency in the expected direction at 6-months for the iABCT group but results should be viewed with caution due to high rates of attrition.
- The effect of the intervention on the WL condition could not be proved at 6-month follow-up due to high dropout rates.
- Regarding participants' opinions of the intervention, participants show a high satisfaction with the program, the program was well-accepted and considered useful. This suggests that technologies could be an attractive and a useful tool in the context of chronic medical conditions.
- Self-criticism was a mediator variable for the relationship between the condition and the well-being, indicating that self-criticism might be a mechanism explaining the efficacy of CBIs in the context of chronic medical conditions.
- Reasons for not participating in iABCT were related to lack of motivation and interest and the presence of too many steps to access to the intervention.
- Reasons for dropping out from iABCT were related to the lack of physical contact with a therapist and the need of more monitoring or support, and with aspects related to the program (i.e. too demanding or tiring).
- Aspects of human support, tailored and shorter programs and assessments and improved website design (e.g. a more attractive and user-friendly program) were improvements considered by participants as facilitators of CBIs.

In conclusion, the iABCT is a well-accepted intervention that represents a potentially beneficial way to support people with chronic medical conditions. Nonetheless, it is clear that the field and the available evidence are in their infancy and a deeper exploration is needed taking into account larger samples, tailored programs, cost-effectiveness analyses and aspects of therapeutic support.

8. References

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ANNEXES

ANNEXES

Annex 1: Questionaries and scales used in the study

1.1. Elegibility assessment (screening):

1. ¿Qué edad tienes? _______________

2. ¿Entiendes y lees bien el español? NO/SÍ

3. ¿Tienes acceso a Internet en casa y dirección de e-mail? NO/SÍ

e-mail: __________________________________

4. ¿Manejas el ordenador a nivel de usuario? (p.ej., búsquedas en Internet, acceso a páginas web, etc.). NO/SÍ

5. A lo largo de tu vida, ¿has recibido algún diagnóstico de trastorno mental? ¿Cuál?
____

6. ¿Hace cuánto te diagnosticaron de tu enfermedad crónica?

____

7. ¿Actualmente estás recibiendo un tratamiento psicológico? NO/SÍ

Si es el caso, ¿qué tipo de intervención estás recibiendo?

8. ¿Padece una enfermedad cardio-respiratoria grave u otra enfermedad física grave o terminal?

9. ¿Ha padecido alguna crisis epiléptica?

10. ¿Actualmente estás recibiendo algún entrenamiento basado en la práctica de meditacion? NO/SÍ

11. ¿Cómo has conocido el estudio?
____

1.2. Sociodemographic and clinical data:

SEXO

1 Mujer

0 Hombre

2 Otros

FECHA DE NACIMIENTO (dd/mm/aaaa): ___ /___ / _____ EDAD ____

NACIONALIDAD: ______________________________

LUGAR DE RESIDENCIA: ____________________

TIPO DE ENFERMEDAD CRÓNICA

☐ Diabetes

☐ Dolor crónico (fibromialgia, migrañas, lumbalgia, etc)

☐ Enfermedad inflamatoria intestinal (colitis ulcerosa, Enfermedad de Chron)

☐ Artritis reumatoide

☐ Otras (especificar):

ESTADO CIVIL:

0 Casado/a o emparejado/a

1 Soltero/a

2 Separado/a Divorciado/a

3 Viudo/a

NIVEL DE ESTUDIOS:

0 No sabe leer ni escribir

1 No ha cursado estudios, pero sabe leer y escribir

2 Graduado escolar (Estudios primarios)

3 Estudios secundarios (BUP, bachillerato superior, COU, PREU, FP II)

4 Estudios universitarios

5 Otros (especificar):

SITUACIÓN LABORAL:

0 Desempleado/a Con subsidio o Sin subsidio

1 Estudiante

2 Ama de casa

3 Empleado/a

4 Empleado/a pero está de baja laboral (ILT). Fecha inicio (dd/mm/aaaa): __/__/____

5 Jubilado/a

6 Incapacitado/a invalidez permanente

7 Otros (especificar):

COMENTARIOS:

DATOS SOBRE LA EXPERIENCIA Y LA PRÁCTICA DE LA MEDITACIÓN

1. ¿Tienes experiencia en la práctica formal de meditación?

0 NO.

1 SI.

Contestar a las siguientes preguntas solo en caso de marcar SI.

2. ¿Dónde aprendiste principalmente a practicar?

☐ Autodidacta (libros, Internet, etc.)

☐ Maestro (Contexto religioso: Budista, Cristiano, etc.)

☐ En el contexto de una terapia

☐ Profesor o Curso de Formación (Contexto no religioso)

☐ Otro (especifique): ________________

3. En la actualidad, teniendo en cuenta el último año, ¿con qué frecuencia meditas?

5 Diariamente

4 Entre 3 y 4 veces por semana

3 Una vez a la semana

2 Entre 2 y 3 veces al mes

1 Esporádicamente (1 vez al mes o menos)

0 Nunca

4. Cuando meditas, ¿Cuánto tiempo estás practicando de media? (en minutos)

____________minutos

5. ¿Desde hace cuánto que meditas?

0 Menos de 1 año

1 Entre 1 y 3 años

2 Entre 4 y 6 años

3 Entre 7 y 9 años

4 Más de 10 años

6. Teniendo en cuenta que es posible que haya habido interrupciones en tu práctica. ¿Durante cuánto tiempo has interrumpido tu práctica a lo largo de tu vida en total? (Contesta en meses):

___________________meses

7. ¿Meditas en el contexto de alguna tradición budista o contexto religioso?

1 Si. ¿Cuál? _________________________

0 No.

1.3. Primary outcomes measures:

Quality of life: The EuroQol 5-Dimensions Questionnaire:

CUESTIONARIO DE SALUD EUROQOL-5D (EQ-5D; The EuroQol Group, 1990).

Marque con una (X) las afirmaciones que describan mejor su estado de salud de **hoy**.

Movilidad

- No tengo problemas para caminar ☐
- Tengo algunos problemas para caminar ☐
- Tengo que estar en la cama ☐

Cuidado Personal

- No tengo problemas con el cuidado personal ☐
- Tengo algunos problemas para lavarme o vestirme ☐
- Soy incapaz de lavarme o vestirme ☐

Actividades Cotidianas (ej., trabajar, estudiar, hacer las tareas domésticas, actividades familiares durante el tiempo libre)

- No tengo problemas para realizar mis actividades cotidianas ☐
- Tengo algunos problemas para realizar mis actividades cotidianas ☐
- Soy incapaz de realizar mis actividades cotidianas ☐

Dolor/Malestar

- No tengo dolor o malestar ☐
- Tengo moderado dolor o malestar ☐
- Tengo mucho dolor o malestar ☐

Ansiedad/Depresión

- No estoy ansioso ni deprimido ☐
- Estoy moderadamente ansioso o deprimido ☐
- Estoy muy ansioso o deprimido ☐

Comparado con mi estado general de salud durante los últimos 12 meses, mi estado de salud hoy es (por favor, marque un cuadro):

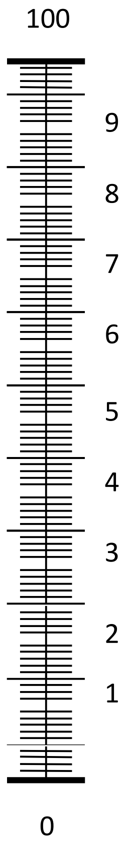
Mejor	Igual	Peor
☐	☐	☐

Para ayudar a la gente a describir lo buen o malo que es su estado de salud hemos dibujado una escala parecida a un termómetro en el cual se marca con un <u>100 el mejor estado</u> de salud que pueda imaginarse y con un <u>0 el peor estado</u> de salud que pueda imaginarse.

Nos gustaría que nos indicara en esta escala, en su opinión, lo bueno y malo que es su estado de salud en el día de HOY. Por favor, dibuje una línea desde el casillero donde dice "*Su estado de salud hoy"* hasta el punto del termómetro que en su opinión indique lo bueno o malo que es su estado de salud en el día de HOY.

Su estado de salud HOY

El mejor estado de salud imaginable



El peor estado de salud imaginable

Well-being: The Pemberton Happiness Index

ÍNDICE DE FELICIDAD DE PEMBERTON (PHI; Hervás y Vázquez, 2013).

Por favor, usando la siguiente escala del 0 al 10, donde 0 significa totalmente en desacuerdo y 10 totalmente de acuerdo, diga en qué medida está de acuerdo con las siguientes afirmaciones. POR FAVOR LEA DETENIDAMENTE CADA UNA DE LAS AFIRMACIONES

(*Rodee con un círculo un número por cada frase, según la escala que aparece a continuación)*

Totalmente en desacuerdo										Totalmente de acuerdo
0	1	2	3	4	5	6	7	8	9	10

1. Me siento muy satisfecho con mi vida	0 1 2 3 4 5 6 7 8 9 10
2. Tengo la energía necesaria para cumplir bien mis tareas cotidianas	0 1 2 3 4 5 6 7 8 9 10
3. Creo que mi vida es útil y valiosa	0 1 2 3 4 5 6 7 8 9 10
4. Me siento satisfecho con mi forma de ser	0 1 2 3 4 5 6 7 8 9 10
5. Mi vida está llena de aprendizajes y desafíos que me hacen crecer	0 1 2 3 4 5 6 7 8 9 10
6. Me siento muy unido a las personas que me rodean	0 1 2 3 4 5 6 7 8 9 10
7. Me siento capaz de resolver la mayoría de los problemas de mi día a día	0 1 2 3 4 5 6 7 8 9 10
8. Creo que en lo importante puedo ser yo mismo	0 1 2 3 4 5 6 7 8 9 10
9. Disfruto cada día de muchas pequeñas cosas	0 1 2 3 4 5 6 7 8 9 10
10. En mi día a día tengo muchos ratos en los que me siento mal	0 1 2 3 4 5 6 7 8 9 10
11. Creo que vivo en una sociedad que me permite desarrollarme plenamente	0 1 2 3 4 5 6 7 8 9 10

Por favor, marque ahora cuál de las siguientes cosas le sucedió AYER:

Me sentí satisfecho por algo que hice	SI ☐ NO ☐
En algunos momentos me sentí desbordado	SI ☐ NO ☐
Pasé un rato divertido con alguien	SI ☐ NO ☐
Me aburrí durante bastante tiempo	SI ☐ NO ☐
Hice algo que realmente disfruto haciendo	SI ☐ NO ☐
Estuve preocupado por temas personales	SI ☐ NO ☐
Aprendí algo interesante	SI ☐ NO ☐
Pasaron cosas que me enfadaron mucho	SI ☐ NO ☐
Me permití un capricho	SI ☐ NO ☐
Me sentí menospreciado por alguien	SI ☐ NO ☐

1.4. Secondary outcomes measures:

Compassion and self-compassion: The Sussex-Oxford Compassion for the Self Scale

ESCALAS DE COMPASIÓN DE SUSSEX-OXFORD (SOCS-S; Gu et al., 2019)

Instrucciones

Debajo hay frases que describen cómo usted podría relacionarse consigo mismo. Por favor, indique hasta qué punto son ciertas para usted usando la siguiente escala de respuestas de 5 puntos (1 = No es verdad en absoluto, 2 = Raramente es verdad, 3 = A veces es verdad, 4 = Casi siempre es verdad, 5 = Siempre es verdad). Por ejemplo, si piensa que la frase casi siempre es verdad, dibuje un círculo en el "4".

Nota: En los ítems de debajo, las palabras generales (ej: 'disgustado', 'angustiado', 'sufrimiento', 'apuros') se utilizan para cubrir un rango de emociones desagradables como tristeza, miedo, ira, frustración, culpa, vergüenza, etc.

Por favor, proporcione una respuesta a cada frase.

	Nunca es verdad	Raramente es verdad	A veces es verdad	Casi siempre es verdad	Siempre es verdad
1. Reconozco perfectamente cuando me siento angustiado.	1	2	3	4	5
2. Entiendo que todos experimentamos sufrimiento en algún momento de nuestras vidas.	1	2	3	4	5
3. Cuando estoy atravesando por un momento difícil, siento compasión hacia mí mismo.	1	2	3	4	5
4. Cuando estoy disgustado, intento estar abierto a mis sentimientos en lugar de evitarlos.	1	2	3	4	5
5. Intento animarme cuando estoy angustiado, incluso si es imposible actuar sobre la causa.	1	2	3	4	5
6. Noto cuando estoy angustiado.	1	2	3	4	5
7. Entiendo que sentirse disgustado a veces es parte de la naturaleza humana.	1	2	3	4	5
8. Cuando me ocurren cosas negativas, cuido de mí mismo.	1	2	3	4	5
9. Conecto con mi propio malestar sin dejar que me sobrepase.	1	2	3	4	5

10. Cuando paso por momentos difíciles, intento cuidar de mí mismo.	1	2	3	4	5
11. Noto rápidamente los primeros signos de angustia en mí mismo.	1	2	3	4	5
12. Como yo, sé que otras personas también pasan apuros en la vida.	1	2	3	4	5
13. Cuando estoy disgustado, intento sintonizar con mis sentimientos	1	2	3	4	5
14. Conecto con mi propio sufrimiento sin juzgarme a mí mismo	1	2	3	4	5
15. Cuando estoy disgustado, intento hacer lo que es mejor para mí.	1	2	3	4	5
16. Reconozco los signos de sufrimiento en mí mismo.	1	2	3	4	5
17. Sé que todos podemos sentirnos angustiados cuando las cosas no van bien en nuestras vidas.	1	2	3	4	5
18. Incluso cuando estoy decepcionado conmigo mismo, puedo darme afecto cuando estoy angustiado.	1	2	3	4	5
19. Cuando estoy disgustado, puedo aceptar la presencia de mis emociones sin sentirme sobrepasado.	1	2	3	4	5
20. Cuando estoy disgustado, hago todo lo posible para cuidar de mí mismo.	1	2	3	4	5

Self-care behaviors: The Mindful Self-Care Scale - Brief version

ESCALA BREVE DE AUTOCUIDADO CONSCIENTE (B-MSC; Hotchkiss & Cook-Cottone, 2019):

Señale la opción que mejor refleje la frecuencia de las siguientes conductas en su caso, durante la última semana (7 DÍAS)

¿Cuantos días de la semana pasada …?

	Nunca	Raramente	A veces	A menudo	Habitualmente
	0 días	1 día	de2 a 3 días	De 3 a 5 días	De 6 a 7 días
1. Comí una gran variedad de alimentos nutritivos (por ejemplo, vegetales, proteínas, frutas y cereales)					
2. Realicé de 30 a 60 minutos de ejercicio					
3. Participé en actividades, como hacer deporte , bailar u otras actividades físicas programadas (ej. deportes de equipo, clases de baile					
4. Realicé actividades sedentarias en lugar de hacer ejercicio (ej. Ver la televisión, trabajar en el ordenador)					
5. Practiqué yoga u otra práctica de equilibrio mente-cuerpo (ej. Tae Kwon Do, Tai Chi)					
6. Pasé tiempo con personas que son buenas para mí (ej. Que me brindan apoyo, me alientan y creen en mí)					
7. Me sentí apoyado por las personas que me rodean					
8. Sentí que alguien me escucharía si me sintiera molesto (ej. Un amigo, consejero, grupo)					
9. Estaba seguro que las personas que me rodean me respetarían si dijese que “no”					
10. Me di cuenta, de forma serena de mis pensamientos					
11. Me di cuenta, de forma serena de mis emociones					
12. Me di cuenta, de forma serena de mi cuerpo					
13. Reconocí amablemente mis propios retos y dificultades					
14. Me dije a mi mism@ palabras de apoyo y consuelo (por ejemplo, "Mi esfuerzo es valioso y significativo")					
15. Me permití sentir mis emociones (ej. me permití llorar)					
16. Experimenté un sentimiento transcendente de propósito en mi vida laboral / escolar (ej. por una causa)					
17. Hice algo creativo para relajarme (ej. dibujé, toqué un instrumento, escribí creativamente, canté, organicé)					

18. He escuchado algo para relajarme (ej. escuché música, un podcast, un programa de radio, sonidos de un bosque)					
19. Miré imágenes para relajarme (ej. arte, película, escaparates de tiendas, naturaleza)					
20. Busqué olores para relajarme (ej. lociones, naturaleza, velas / incienso)					
21. Mantuve mi área de trabajo organizada para ayudarme en mis tareas					
22. Mantuve un horario manejable					
23. Mantuve el equilibrio entre las demandas de los demás y lo que es importante para mí					
24. Mantuve un ambiente agradable y reconfortante					

Self-criticism: The Self-critical Rumination Scale

ESCALA DE RUMINACIÓN AUTOCRÍTICA (SCRS; Smart et al., 2015)

Por favor lea cada afirmación cuidadosamente y valore cuánto le describe cada ítem. Utilice la siguiente escala:

En absoluto	Un poco	Moderadamente	Mucho
1	2	3	4

1	A menudo centro mi atención en aspectos de mí mismo/a que me avergüenzan.	1	2	3	4
2	Parece que siempre estoy repitiendo mentalmente las tonterías que he dicho o hecho.	1	2	3	4
3	A veces me resulta difícil detener los pensamientos críticos sobre mí mismo/a.	1	2	3	4
4	No puedo dejar de pensar en de qué otras maneras podría haber actuado en ciertas situaciones.	1	2	3	4
5	Paso mucho tiempo pensando en cómo me avergüenzan algunos de mis hábitos.	1	2	3	4
6	Me critico mucho por cómo me comporto ante de los demás.	1	2	3	4
7	Desearía pasar menos tiempo criticándome.	1	2	3	4
8	A menudo me preocupo por todos los errores que he cometido.	1	2	3	4
9	Paso mucho tiempo deseando ser distinto/a.	1	2	3	4
10	A menudo me riño a mí mismo/a por no ser tan productivo/a cómo debería ser.	1	2	3	4

Symptomatology: The Depression, Anxiety and Stress Scale

ESCALA DE DEPRESIÓN, ANSIEDAD Y ESTRÉS (DASS-21; Henry & Crawford, 2005)

Por favor lea las siguientes afirmaciones y coloque un círculo alrededor de un número (0, 1, 2, 3) que indica cuánto esta afirmación le aplicó a usted *durante la semana pasada.* No hay respuestas correctas o incorrectas. No tome demasiado tiempo para contestar.

La escala de calificación es la siguiente: 0=No me aplicó; 1= Me aplicó un poco, o durante parte del tiempo; 2= Me aplicó bastante, o durante una buena parte del tiempo; 3=Me aplicó mucho, o la mayor parte del tiempo

1.	Me costó mucho relajarme..	0	1	2	3
2.	Me di cuenta que tenía la boca seca	0	1	2	3
3.	No podía sentir ningún sentimiento positivo	0	1	2	3
4.	Se me hizo difícil respirar...	0	1	2	3
5.	Se me hizo difícil tomar la iniciativa para hacer cosas	0	1	2	3
6.	Reaccioné exageradamente en ciertas situaciones	0	1	2	3
7.	Sentí que mis manos temblaban	0	1	2	3
8.	Sentí que tenía muchos nervios	0	1	2	3
9.	Estaba preocupado por situaciones en las cuales podía tener pánico o en las que podría hacer el ridículo	0	1	2	3
10	Sentí que no tenía nada por que vivir..	0	1	2	3
11	Noté que me agitaba..	0	1	2	3
12	Se me hizo difícil relajarme	0	1	2	3
13	Me sentí triste y deprimido	0	1	2	3
14	No toleré nada que no me permitiera continuar con lo que estaba haciendo	0	1	2	3
15	Sentí que estaba al punto de pánico	0	1	2	3
16	No me pude entusiasmar por nada..	0	1	2	3
17	Sentí que valía muy poco como persona	0	1	2	3
18	Sentí que estaba muy irritable..	0	1	2	3
19	Sentí los latidos de mi corazón a pesar de no haber hecho ningún esfuerzo físico .	0	1	2	3
20	Tuve miedo sin razón	0	1	2	3
21	Sentí que la vida no tenía ningún sentido...	0	1	2	3

Attachment styles: The Relationships Questionnaire

CUESTIONARIO DE RELACIÓN (RQ; Yárnoz-Yaben y Comino, 2011).

Instrucciones:

Seguidamente aparecen cuatro párrafos referidos a nuestra forma de relacionarnos con los demás. En esta ocasión deberá rodear con un círculo el número que refleje su grado de acuerdo con la idea que se expresa en cada párrafo según la siguiente escala:

1=Totalmente en desacuerdo; 2= Bastante en desacuerdo; 3=Un poco en desacuerdo; 4=Ni desacuerdo/ni acuerdo; 5=Un poco de acuerdo; 6=Bastante de acuerdo; 7=Totalmente de acuerdo.

1. Me resulta fácil acercarme emocionalmente a los demás. Me siento cómodo (A) tanto en las situaciones en que tengo que confiar en los demás como en aquellas en que otros han depositado su confianza en mí. El hecho de estar solo (a) o de que los demás no me acepte no me trastorna.

1	2	3	4	5	6	7

2. Me siento bien cuando no tengo una relación afectiva. Es muy importante para mí sentirme independiente y autosuficiente, y prefiero no depender de otros o que otros dependan de mí.

1	2	3	4	5	6	7

3. Quiero establecer un mayor grado de intimidad afectiva con los demás, pero a menudo encuentro que los demás marcan más distancia de lo que a mí me gustaría. Me siento perdido (a) cuando no estoy en una relación afectiva, pero a veces me altera que los demás no me valoren tanto como yo les valoro a ellos (as).

1	2	3	4	5	6	7

4. Me relaciono mal cuando no me acerco emocionalmente a los otros. Quiero mantener relaciones afectivas, pero encuentro difícil confiar totalmente, o depender de los demás. Me preocupa que pueda sufrir si no girado las distancias con los demás.

1	2	3	4	5	6	7

Rodee con un círculo el párrafo que se adecue a su forma de relacionarse afectivamente de entre los cuatro mostrados en este cuestionario:

1	2	3	4

Social support: The Medical Outcomes Study-Social Support Survey

CUESTIONARIO DE APOYO SOCIAL (MOS-SSS; Sherbourne & Stewart, 1991)

Las siguientes preguntas se refieren al apoyo o ayuda de la que Usted dispone:

1. Aproximadamente, ¿cuántos amigos íntimos o familiares cercanos tiene Ud. (personas con las que se encuentra a gusto y puede hablar acerca de todo lo que se le ocurre).

Escriba el nº de amigos íntimos ____ y familiares cercanos ____.

La gente busca a otras personas para encontrar compañía, asistencia, u otros tipos de ayuda, ¿Con qué frecuencia dispone Ud. de cada uno de los siguientes tipos de apoyo cuando lo necesita? Indique uno de los números de cada fila.

	Nunca	Pocas veces	Algunas veces	La mayoría de veces	Siempre
2. Alguien que le ayude cuando tenga que estar en cama.	1	2	3	4	5
3. Alguien con quien pueda contar cuando necesite hablar	1	2	3	4	5
4. Alguien que le aconseje cuando tenga problemas.	1	2	3	4	5
5. Alguien que le lleve al médico cuando lo necesita.	1	2	3	4	5
6. Alguien que le muestre amor y afecto.	1	2	3	4	5
7. Alguien con quien pasar un buen rato.	1	2	3	4	5
8. Alguien que le informe y le ayude a entender una situación.	1	2	3	4	5
9. Alguien en quien confiar o con quien hablar de sí mismo y sus preocupaciones.	1	2	3	4	5
10. Alguien que le abrace.	1	2	3	4	5
11. Alguien con quien pueda relajarse.	1	2	3	4	5
12.Alguien que le prepare la comida si no puede hacerlo.	1	2	3	4	5
13. Alguien cuyo consejo realmente desee.	1	2	3	4	5
14. Alguien con quien hacer cosas que le sirvan para olvidar sus problemas.	1	2	3	4	5
15. Alguien que le ayude en sus tareas domésticas si está enfermo.	1	2	3	4	5

16. Alguien con quien compartir sus temores y problemas más íntimos.	1	2	3	4	5
17. Alguien que le aconseje cómo resolver sus problemas personales.	1	2	3	4	5
18. Alguien con quien divertirse.	1	2	3	4	5
19. Alguien que comprenda sus problemas.	1	2	3	4	5
20. Alguien a quien amar y hacerle sentirse querido.	1	2	3	4	5

Quality of compassion meditation practice: The Compassion Practice Quality Questionnaire

CALIDAD DE LA PRÁCTICA DE COMPASIÓN (Navarrete et al., 2021)

Respecto a la sesión de hoy (o en la última práctica realizada), por favor señala el porcentaje aproximado de tiempo que tu experiencia reflejó cada uno de los enunciados que encontrarás a continuación:

	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Durante la práctica, tuve muchas dificultades para escoger los elementos que conformaban la imagen mental que estaba utilizando para generar un estado de compasión/autocompasión											
Durante la práctica, tuve muchas dificultades para construir la imagen mental que estaba utilizando para generar un estado de compasión/autocompasión											
Durante la práctica, tuve muchas dificultades para sostener la imagen mental que estaba utilizando para generar un estado de compasión/autocompasión											
Durante la práctica, logré activar una sensación de calidez y afecto hacia los demás											
Durante la práctica, tuve muchas dificultades para ver con claridad y detalle la imagen mental que estaba utilizando para generar un estado de compasión/autocompasión											
Durante la práctica, he sentido que estaba completamente dentro de la visualización, olvidándome que estaba en esta sala											
Durante la práctica, me juzgué por no ser capaz de sentir compasión											
Durante la práctica, noté en mi cuerpo una sensación de calidez y confort											
Durante la práctica, percibí una gran conexión y cercanía afectiva con la imagen mental que estaba utilizando para generar un estado de compasión/autocompasión											

1.5. Acceptability outcome measures of intervention

Expectations and satisfaction: Expectancy and satisfaction questionnaire

CUESTIONARIO DE EXPECTATIVAS Y SATISFACCIÓN (adaptado por Campos y cols.,2020 de Borkovec and Nau, 1972).

Por favor, para mejorar nuestros servicios nos gustaría hacerle algunas preguntas sobre la atención que usted ha recibido. Nos interesa conocer su verdadera opinión, sea esta positiva o negativa. Por favor responda a todas las cuestiones que le planteamos.

Señale la opción correcta a cada pregunta:

¿Cómo evaluaría la calidad de los servicios que ha recibido?

1. Excelente
2. Buena
3. Regular
4. Mala

¿Recibió la clase de servicio que usted requería?

1. No, definitivamente
2. En muy pocos casos
3. Sí, en general
4. Sí, definitivamente

¿Hasta qué punto ha ayudado nuestro programa a solucionar sus problemas?

1. En casi todos
2. En la mayor parte
3. Solo en algunos
4. En ninguno

¿Si un/a amigo/a estuviera en necesidad de ayuda similar, le recomendaría nuestro programa?

1. No, definitivamente
2. No, creo que no
3. Sí, creo que sí
4. Sí, definitivamente

¿Cómo de satisfecho/a está usted con la cantidad de ayuda que ha recibido?

1. Nada satisfecho/a
2. Indiferente o moderadamente no satisfecho/a
3. Moderadamente satisfecho/a
4. Muy satisfecho/a

¿Los servicios que ha recibido le han ayudado a enfrentarse mejor a sus problemas?

1. Sí, me ayudaron mucho
2. Sí, me ayudaron algo
3. No, realmente no me ayudaron
4. No, parecían poner las cosas peor

¿En general, cómo de satisfecho/a está usted con los servicios que ha recibido?

1. Muy satisfecho/a
2. Moderadamente satisfecho/a
3. Algo satisfecho/a
4. Muy insatisfecho/a

¿Si necesitara ayuda otra vez, volvería a nuestro programa?

1. No, definitivamente
2. No, posiblemente
3. Sí, creo que sí
4. Sí, con seguridad

Usability: System Usability Scale

CUESTIONARIO DE USABILIDAD Y ACEPTACIÓN (CUA; adaptado por Campos y cols. 2020).

Instrucciones: Marca el grado de acuerdo con cada una de las afirmaciones que verás a continuación:

	Totalmente desacuerdo	Algo en desacuerdo	Ni de acuerdo ni en desacuerdo	Bastante de acuerdo	Totalmente de acuerdo
1. Pienso que la mayoría de las personas podrían aprender muy rápidamente a utilizar este programa.	1	2	3	4	5
2. Me he sentido seguro de lo que hacía utilizando este programa	1	2	3	4	5
3. En general, he sabido qué tenía que hacer en cada momento. Por ejemplo, cuando he querido hacer algo he sabido qué botón pulsar.	1	2	3	4	5
4. Una vez que he aprendido a usar este programa me ha permitido realizar las tareas rápidamente.	1	2	3	4	5
5. En general, he podido hacer lo que he querido en cada momento. Por ejemplo, cuando he querido pulsar un botón concreto lo he conseguido.	1	2	3	4	5
6. Las instrucciones de este programa son fáciles.	1	2	3	4	5
7. El tamaño de la letra y botones es suficiente para mí.	1	2	3	4	5
8. Me gustaría utilizar este sistema frecuentemente.	1	2	3	4	5
9. En general, creo que este programa es muy útil para mí.	1	2	3	4	5
10. En general, creo que este programa es fácil de usar.	1	2	3	4	5

Participant's opinion: Semi-structured qualitative interview (Quiñonez-Freire et al., 2020; van der Hout et al., 2021).

Preguntas para el grupo *No participation:*

Cuéntanos, ¿por qué decidiste no participar en el estudio? Por favor, trata de ser lo más honesto/a. A continuación encontrarás una serie de razones que algunas personas mencionan para no participar en estos estudios. Marca todas las que mejor representen tu situación o, en caso de que ninguna lo haga, escribe otras razones en el apartado de "otras".

Decidiste no participar porque...

☐ Sentiste que tu estado emocional o físico mejoró
☐ Extrañaste la presencia física de un/a terapeuta
☐ No te sentías motivado/a
☐ No te interesó la intervención CUIDATEC
☐ No estabas interesado/a en la investigación científica
☐ La plataforma no era lo que esperabas para recibir atención psicológica
☐ Tuviste problemas de acceso con el ordenador o a Internet
☐ Habrías preferido realizar el programa en otro dispositivo electrónico a parte del ordenador como teléfono o tablet
☐ Hubo alguna circunstancia relacionada con la pandemia de la COVID-19

☐ Las evaluaciones eran demasiado largas, con muchos cuestionarios

☐ Había demasiados pasos para acceder

☐ Otras razones (especificar).

Preguntas para el grupo *Drop-out:*

Cuéntanos, ¿por qué decidiste no continuar con la intervención? Por favor, trata de ser lo más honesto/a. A continuación, encontrarás una serie de razones que algunas personas mencionan para abandonar o interrumpir las intervenciones online. Marca todas las que mejor representen tu situación o, en caso de que ninguna lo haga, escribe otras razones en el apartado de "otras".

Decidiste no continuar con la intervención porque….

☐ Sentiste que tu estado emocional mejoró
☐ Pensaste que el programa no te estaba aportando beneficios
☐ Lo que ofrecía el programa no era lo que esperaba
☐ Sentiste la necesidad de mayor contacto físico con un/a terapeuta
☐ Sentiste la necesidad de un mayor seguimiento
☐ Sentiste la necesidad de una mayor contención
☐ No te sentías motivado/a
☐ El programa no fue de tu interés
☐ La plataforma no fue lo que esperabas para recibir atención psicológica
☐ El formato de la plataforma no te agradaba
☐ Tuviste problemas de acceso con el ordenador o Internet
☐ Habrías preferido realizar el programa en otro dispositivo electrónico a parte del ordenador como teléfono o Tablet
☐ El programa fue difícil de adaptar en tu día a día
☐ Te requería demasiado tiempo
☐ Hubo elementos en la plataforma que te resultaron muy demandantes, cansados o repetitivos (ej. cuestionarios, ejercicios, prácticas, etc)
☐ Pensaste que el programa era demasiado largo
☐ Hubo alguna circunstancia relacionada con la pandemia de COVID-19

☐ Otras razones (especificar):

Opinión respecto a las mejoras:

Para finalizar, nos gustaría conocer tu opinión sobre el programa (tanto como si lo has empezado como lo que te gustaría encontrar en programas online de este estilo).

1. *¿Qué aspectos, a nivel general, crees que se podrían mejorar para que el programa fuera de un mayor agrado para la mayoría de los/as usuarios/as?*

2. *¿Qué características debería tener? ¿Qué características has echado en falta?*

Marca las mejoras que te hubiera gustado encontrar en el programa: consideras que alguna de las siguientes mejoras:

☐ Un programa más breve
☐ Diferente diseño (más fácil y atractivo)
☐ Diferente formato (por ejemplo, en app para Smartphone)
☐ Un programa más personalizado
☐ Un programa más específico y dirigido a mi problema
☐ Con una mayor presencia del/la terapeuta
☐ Totalmente presencial
☐ Más interacción
☐ Diferentes funcionalidades como chats o foros donde los que interaccionar
☐ Otras (especificar)

Annex 2: Posters and flyers used in the recruitment of the study

2.1. Flyer used for the dissemination on hospitals and chronic patients' associations:

Intervención online para enfermedades médicas crónicas

CuidaTec

¿Quiénes somos?

labpsitec

En el Laboratorio de Psicología y Tecnología (**LabPsiTec**), de la Universitat de Valencia, llevamos más de 15 años investigando las posibilidades que las Tecnologías de la Información y la Comunicación (TICs) (como la Realidad Virtual, Internet, los sistemas móviles, etc.) pueden ofrecer a la Psicología Clínica, como herramientas de evaluación y de tratamiento.

Nuestro estudio

El **objetivo** de este estudio es analizar la eficacia de una intervención online basada en la compasión para mejorar la calidad de vida de pacientes con enfermedades médicas crónicas.

Intervención online

El programa consta de 8 módulos y una duración de aproximadamente 8 semanas. Estará disponible en la plataforma web **Psicologia y Tecnologia**, en la que encontrarás:

- **Módulos de tratamiento** que cuentan con estrategias eficaces para llevar un mejor manejo de la enfermedad.
- **Ejercicios semanales** para poner en marcha todo lo aprendido.
- **Material audiovisual** como vídeos, audios o enlaces que te facilitarán consolidar todos tus aprendizajes.

Procedimiento

En primer lugar, necesitamos aseguramos de que el tratamiento va a ser el adecuado para ti y por tanto, cumples los criterios de inclusión para participar en este estudio. En el caso de que los cumplas serás asignad@ a una de las dos condiciones del estudio:

a **Intervención online:** tendrás acceso al tratamiento después de completar la primera evaluación.

b **Lista de espera:** tendrás acceso al tratamiento a los 3 meses de apuntarte a participar.

¿Qué son las enfermedades médicas crónicas?

Las enfermedades crónicas son enfermedades de larga duración y progresión generalmente lenta (p. ej: diabetes, dolor crónico, enfermedad inflamatoria intestinal, etc).
Suelen requerir un cambio en el estilo de vida o un régimen de tratamiento que puede parecer frustrante para las personas que las padecen. Por eso, en muchos casos pueden aparecer altibajos emocionales y una peor calidad de vida.

¿Cómo me va a ayudar?

Con **CUIDATEC**, pondrás en práctica la **compasión**, una forma de afrontar el sufrimiento de manera amable y bondadosa.

Adoptar una actitud compasiva ante tu enfermedad puede ayudarte a actuar de una manera más efectiva sobre lo que te está pasando. Te puede ayudar a:

Comprometerte con acciones de cuidado que alivien tu malestar.

Regular emociones difíciles.

Sentirte menos aislad@ y más comprendid@ respecto a tu enfermedad.

¿Cómo participo?

Si tienes una enfermedad médica crónica y te resulta difícil poner en marcha estrategias de autocuidado, este programa es para tí.

Participa en el siguiente link:
bit.ly/cuidatecBL

Si quieres más información puedes escribirnos a:
cuidatec.online@gmail.com

También puedes consultar nuestra web en:
cuidateconline.wixsite.com/cuidatec

2.2. Flyer and description used for the dissemination on social media

APRENDE A CUIDARTE

¿Tienes una enfermedad crónica y te cuesta poner en marcha estrategias de autocuidado?

CuidaTec

CUIDA-TEC es una intervención online gratuita que te ayudará en el manejo de tu enfermedad.

Si estás interesad@ en participar entra al siguiente enlace: bit.ly/cuidatec

o escribe un correo a cuidatec.online@gmail.com

¡Hola! 👋

Hoy queremos comentaros un estudio nuevo que acabamos de lanzar en el Laboratorio de Psicología y Tecnología (**LabPsiTec**), de la Universitat de València. ¿Os apetece conocerlo?

CuidaTec es una intervención online totalmente gratuita cuyo objetivo es ayudar a manejar la enfermedad crónica. Forma parte de un estudio que busca analizar la eficacia de una intervención online basada en la compasión para mejorar la calidad de vida de pacientes con enfermedades médicas crónicas.

Procedimiento: En primer lugar, necesitamos asegurarnos de que el tratamiento va a ser el adecuado para ti y, por tanto, cumples los criterios de inclusión para participar en este estudio. En el caso de que los cumplas serás asignad@ a una de las dos condiciones del estudio:

- **Intervención online:** tendrás acceso al tratamiento después de completar la primera evaluación.
- **Lista de espera:** tendrás acceso al tratamiento a los 3 meses de apuntarte a participar.

¿Te interesa? ¡Si tienes una enfermedad médica crónica y te cuesta poner en marcha estrategias de autocuidado este recurso es para ti!

Si estás interesad@ te dejamos aquí el link: bit.ly/cuidatecBL

Y si te gustaría recibir más información nos puedes escribir al correo: cuidatec.online@gmail.com

También puedes consultar nuestra página web: cuidateconline.wixsite.com/cuidatec

Si no es tu caso, pero te gustaría hacerlo llegar a más gente, te agradeceríamos su difusión.

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