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**Clinician attitudes towards, and patient well-being outcomes from,
computerised Cognitive Behavioural Therapy: A research portfolio.**

Joanne K. Persson

Doctorate in Clinical Psychology

University of Edinburgh, January 2018

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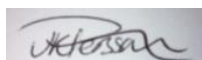
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Thesis Overview

This thesis follows the research portfolio format and is carried out in part fulfilment of the academic component of the Doctorate in Clinical Psychology at the University of Edinburgh. An abstract provides an overview of the entire portfolio thesis.

Chapter One contains a systematic review of published research exploring staff attitudes towards computerized cognitive behavior therapy (cCBT). Chapter Two is an empirical study examining a range of potential predictor variables on well-being outcomes from cCBT. Chapter one is prepared for Behavioural and Cognitive Psychotherapy, whereas chapter two is prepared for submission to the journal, Behaviour Research and Therapy. Both chapters follow the relevant author guidelines.

Word Count (including tables and figures)

Systematic review = 10,045

Empirical study = 9,905

Total thesis portfolio = 19,950

Thesis Abstract

Background: Evidence suggests that computerised cognitive behavioural therapy (cCBT) is both effective and efficacious in treating depression and anxiety.

Numerous barriers to its implementation and uptake have been identified, however, including attitudinal variables and high patient attrition rates. Research examining predictors of response from cCBT have tended to adopt the pathological model of distress, focussing on symptom reduction rather than the promotion of well-being.

Furthermore, exploration of possible predictors has tended to focus on a narrow range of factors (e.g. age, gender), neglecting key psychosocial variables (e.g. social identification, baseline distress) that could be exerting an effect.

Aims: A systematic review examined staff attitudes towards cCBT for depression, anxiety, and comorbid depression and anxiety, focussing on three attitudinal domains: Perceived acceptability of cCBT; staff's self-reported intention to use cCBT in the future, and perceived advantages and disadvantages of cCBT for depression and/or anxiety. An experimental study was subsequently conducted, examining a range of potential predictors on well-being outcomes from a cCBT intervention utilising Beating the Blues.

Method: A systematic search across five databases was conducted, followed by manual searches. Strict search criteria were applied, resulting in the identification of 15 studies. These were subjected to quality assessment, data extraction and synthesis. For the empirical study, data from 1354 participants was collected, with subgroup-analyses conducted on those completing measures of life and mental health satisfaction, functioning and well-being. Key potential predictors of interest were level of group identification, baseline distress, and socioeconomic deprivation.

Results: Findings from the systematic review indicated that staff held relatively positive attitudes towards cCBT, with some ambivalence emerging in relation to perceived advantages and disadvantages of the intervention. The empirical study obtained significant effects of group identification on life and mental health satisfaction. A mediating impact of group identity on baseline distress emerged, whereas a moderating effect of baseline distress on deprivation was obtained for the functioning model.

Discussion: The current findings demonstrated both positive and negative aspects of staff attitudes towards cCBT for depression and/or anxiety, whereas the empirical project established a clear link between social identification, baseline distress, and well-being. Results from both studies are discussed in terms of clinical implications relating to the uptake of cCBT.

Chapter One: Systematic review

Journal choice: Behavioural and Cognitive Psychotherapy

(5000 words, excluding references, tables and figures)

Title: Staff attitudes towards computerised Cognitive Behaviour Therapy: Perceived advantages and disadvantages.

Abbreviated title for running head: Staff attitudes towards cCBT.

Keywords: cCBT, attitudes, staff

1.1: Abstract

Background: Evidence suggests that computerised cognitive behavioural therapy (cCBT) is efficacious in treating depression. Numerous barriers to its uptake and implementation have been identified, however, including attitudinal variables. A systematic review (Kaltenthaler et al., 2008) of patient attitudes towards computer-based CBT programmes indicated such interventions are acceptable to patients. To date, no systematic review has examined staff perspectives on cCBT, despite recognition that such attitudes can constitute barriers or facilitators of access to care.

Aims: To systematically review and synthesize existing data on staff attitudes towards cCBT. Attitudes were assessed across three domains: Perceived acceptability of cCBT for anxiety, depression, or mixed anxiety and depression; clinicians' intention to use cCBT in the future, and perceived advantages and disadvantages of cCBT.

Method: A systematic search of five electronic databases (PsycINFO, Medline, Embase, Embase Classic and CINAHL) was conducted. Manual citation searches and searches of reference lists of all identified studies were completed. 1198 possible studies were identified, with 15 meeting full inclusion criteria. Key study information was extracted, synthesised, and subjected to methodological quality assessment. **Results:** Analysis revealed staff perceptions of cCBT as an acceptable treatment for depression and anxiety, with few staff expressing disinclination to use it in the future. Ambivalent attitudes towards advantages and disadvantages of cCBT emerged, with staff holding contradictory perceptions across four themes: patient and staff-related factors, organizational context, and programme practicalities. **Conclusions:** Overall, results indicated ambivalent attitudes towards cCBT from staff. Results are discussed in terms of strengths and limitations of the available evidence, and clinical implications for uptake of cCBT.

1.2: Introduction

Mental health problems are widespread across Europe (Ferrari et al., 2010). Some of the highest prevalence rates occur for anxiety and depressive disorders (Wittchen et al., 2011). Both disorders have been conceptualised as chronic conditions (e.g. Penninx et al., 2011; Richards, 2011) that affect individuals of all ages, including children, adolescents and adults (Avenevoli, Swendsen, He, Burstein, & Merikangas, 2015; Wittchen et al., 2011). Wide-ranging costs are associated with anxiety and depressive disorders on both individual and societal levels, including reduced quality of life (QoL; Zeng, Xu, & Wang, 2013), poor health outcomes (e.g. Cohen, Edmondson, & Kronish, 2015) and economic burden (Greenberg, Fournier, Sisitsky, Pike, & Kessler, 2015).

Guidelines from the National Institute of Health and Care Excellence (NICE) recommend the use of psychological therapies, including cognitive behavioural therapy (CBT; Beck, 1967), for the treatment of depression (NICE 2009) and anxiety (NICE 2011). A large evidence base demonstrates the efficacy of CBT in alleviating patient distress in both adult (e.g. Andersson, Cuijpers, Carlbring, Riper, & Hedman, 2014) and child or youth populations (Öst & Ollendick, 2017), yet access to such treatments remains low (Lawrence et al., 2015). This is despite recent governmental strategies that aim to improve access to psychological therapies (e.g. Scottish Government, 2017).

Numerous barriers to the uptake of traditional psychological interventions have been identified, including stigma around help-seeking behaviour (Ferrari, 2016), limited supply of trained clinicians (Layard, 2006), and difficulty accessing services for individuals from rural locations (Dolja-Gore et al., 2014). Considering the

limited number of patients currently accessing psychological treatment (Lawrence et al., 2015), researchers have argued that existing psychological models require adaption in order to increase access to specialist services (e.g. Newton & Sundin, 2016).

One potential adaptation that may help to address the barriers outlined above is through the use of computerised treatments. Debate has arisen over the definition of computerised approaches (see Barak, Klein, & Proudfoot, 2009), with some articles referring to ‘eTherapy’ or ‘eHealth’ in relation to information and communication technologies (such as professionals’ utilisation of email or tablets; e.g. Olok et al., 2015), online educational resources (Whittemore et al., 2013), or web-based interventions adopting specific therapeutic models, such as psychodynamic (Zwerenz et al., 2017) or cognitive behavioural approaches (Cientanni et al., 2017).

The current study refers to computerised CBT (cCBT), and adopts the definition proposed by NICE: ‘*cCBT is a generic term that is used to refer to a number of methods of delivering CBT via an interactive computer interface*’ (2006, section 3.1). An additional consideration emphasised by Barak and colleagues (2009) is that cCBT can be employed as a standalone treatment (i.e. completed without assistance from a therapist), or in conjunction with face-to-face therapy from a clinician (see Barak, Klein, & Proudfoot, 2009). A growing literature base indicates that cCBT is efficacious in treating depression (e.g. Andersson, Cuijpers, Carlbring, Riper, & Hedman, 2014), anxiety (for a review, see Olthuis, Watt, Bailey, Hayden, & Stewart, 2016) and mixed anxiety and depression (Titov et al., 2016). Recent evidence suggests that cCBT can be as effective as face-to-face CBT (Andersson et al., 2014; Titov et al., 2015) whilst being less expensive (Gerhards et

al., 2010; but see Kenter et al., 2015), in part due to requiring less clinician time than face-to-face approaches (Titov et al., 2015).

Evidence also indicates that cCBT may help to overcome barriers associated with more traditional approaches, such as stigma related to help-seeking behaviour (Choi, Sharpe, Li & Hunt, 2015) and patients' geographical distance from available services (Farrer, Christensen, Griffiths, & Mackinnon, 2011). Recent literature has emphasised additional benefits of cCBT, such as increased flexibility for both clinicians and patients (e.g. over appointment times; Gellatly et al., 2017) and appealing to patients who might find traditional, face-to-face approaches threatening (e.g. those with social phobias; Wilhelmsen et al., 2014). In combination, these factors indicate that cCBT offers a treatment modality that can increase access to cost-effective psychological therapy (Gerhards et al., 2010), which could help to alleviate the burden placed on a psychology workforce that is already overstretched (Scottish Government, 2011; Wilhelmsen et al., 2014).

Notwithstanding its potential benefits, cCBT appears to be under-utilised by patients and clinicians within routine care for adults (MacLeod, Martinez, & Williams, 2009) and within child and adolescent mental health services (CAMHS; Stallard et al., 2010). Just as with more traditional approaches, a range of criticisms of cCBT or barriers to its implementation have been identified (see Twomey & O'Reilly, 2017), including practical considerations that could limit access (e.g. lack of high speed internet; Andrewes, Kenicer, McClay, & Williams, 2013), and potential attitudinal barriers from patients or healthcare professionals (e.g. Knowles et al., 2014). Indeed, mental health staff have been shown to perceive attitudinal variables as one of the main barriers to the implementation of new psychological

treatments (Cook, Biyanova, & Coyne, 2009). Understanding the attitudes and perspectives of stakeholders involved in the therapeutic process, including patients and staff, could therefore be central to facilitating the uptake of computerised approaches in routine care (Montero-Marin et al., 2016).

To date, two systematic reviews have examined adult patients' attitudes towards cCBT for depression (Bowyer, 2017; Kaltenthaler et al., 2008)¹. In the work by Kaltenthaler and colleagues, data was synthesized from 12 studies that utilised questionnaires to assess patients' acceptability or satisfaction with cCBT. High ratings of both acceptability and satisfaction emerged from the majority of studies, leading the authors to conclude that patients hold positive perceptions of cCBT. Similarly, in the latter review (including studies published since 2007, in order to provide an update from the earlier analysis), patients reported high levels of self-reported satisfaction.

Although patients' attitudes towards cCBT are increasingly understood (e.g. Alaoui et al., 2015), few studies have explored staff perspectives to such approaches (Newton & Sundin, 2016). This is despite recognition that clinicians' attitudes may constitute a major barrier to the implementation of new psychological approaches (Cook et al., 2009; Vigerland et al., 2014), and that staff perceptions of cCBT are likely to influence patients' uptake of the programmes (Du et al., 2013). Where research into clinician attitudes has been conducted, it has tended to be restricted to a narrow range of topics, such as comparisons of attitudes towards cCBT versus face-to-face therapies (e.g. Stallard et al., 2010), or has focused on generic online therapies, rather than investigating attitudes towards cCBT specifically (e.g.

¹ One additional systematic review on computerized approaches (Knowles et al., 2014) has also been conducted. This review included both CBT and other treatment modalities (e.g. interpersonal therapy), however, and so was excluded from our review.

Schröder et al., 2017). This means that our understanding of clinicians' perspectives on cCBT remains limited. To the best of our knowledge, to date no systematic review has examined the content of staff attitudes towards cCBT.

The main aim of this review was therefore to employ a systematic approach to the search for and analysis of published research, in order to answer the question "What attitudes do staff hold about cCBT for depression and/or anxiety"? We assessed attitudes across three main domains: perceived acceptability or suitability of cCBT for depression and/or anxiety (defined as whether clinicians perceived cCBT to be an appropriate treatment for the condition, and variables relating to this perception e.g. improvement rates); reports of whether staff were likely to use cCBT in the future, and perceived advantages versus disadvantages regarding cCBT for depression and/or anxiety (e.g. Salloum, Crawford, Lewin, & Storch, 2015). This was in order to answer the secondary aim of this review: To determine whether any consistent advantages or disadvantages of computer-assisted approaches could be identified.

Considering the lack of previous research in this area, the review aimed to synthesize findings from both qualitative and quantitative studies, in order to allow for a greater understanding of the available yet limited data. This is in line with recent guidelines from the Joanna Briggs Institute (Pearson et al., 2014), which recommend the inclusion of both qualitative and quantitative data into systematic reviews. While the findings of individual qualitative studies are specific to the context from which they are obtained (e.g. examination of experiences from a specific population) and are therefore not generalisable (Malterud, 2001), systematic

analysis allows us to identify themes from multiple sources (Stuart, Tansey, & Quayle, 2016) which may have wider applicability.

1.3: Method

The reporting of this systematic review followed guidelines from the Centre for Reviews and Dissemination (CRD; 2009) and PRISMA (Moher, Liberati, Tetzlaff, & Altman, 2009) utilizing the PICOS methodology (i.e. consideration of the population, interventions, comparators, outcomes, and design of relevant studies)².

1.3.1: Search strategies

Translation of studies in languages other than English was beyond the scope of this review, so searches were restricted to articles published in English. The systematic search was conducted in January, 2017, and consisted of an initial search of the Cochrane and Prospero databases to identify whether any similar systematic reviews had recently been undertaken. This search revealed one article of relevance to this review: a protocol for a review on patient attitudes to cCBT (Bowyer, 2017).

As no further reviews were identified, the following databases were subsequently searched: Embase Classic and Embase (1947 - 2017); PsychINFO (1806 - 2017), Ovid Medline³ (R; 1946 – 2017), and CINAHL. A keyword search across all fields was undertaken across three main subject domains: cCBT, staff groups, and attitudinal or intervention feasibility ratings (see Appendix 1 for full list of search terms), with duplicate articles removed. Due to the lack of research within

² As emphasized in the CRD guidelines, not all systematic review questions will incorporate all five elements from PICOS (see <https://www.york.ac.uk/crd/SysRev/ISSL/WebHelp/SysRev3.htm>). As our research questions did not assess intervention effectiveness trials, the comparators element (e.g. control conditions) was not considered.

³ Including Epub ahead of print

this area (Newton & Sundin, 2016), no timeframe was set for the search, in order to be as inclusive as possible. Searches were re-run in September, 2017, to identify whether any additional articles had been published.

Two manual searches were also undertaken: An examination of the reference lists of each of the articles identified by the database search, and a citation search of each identified article. An additional citation search was also conducted on six, previously identified studies that examined staff attitudes towards computerised psychological therapies (Becker & Jensen-Doss, 2013; Donovan, Poole, Boyes, Redgate, & March, 2015; Du, Quayle, & Macleod, 2013; Perle et al., 2013; Waller & Gilbody, 2009; Whitfield & Williams, 2004). Following SIGN Guideline 50 (2015), hand searches of key journals were not conducted. Any relevant papers that had been omitted from the initial database search but were identified in these latter searches were included in the current systematic review. Any duplicate articles identified by the search strategies were removed, resulting in a total of 1198 potentially relevant studies.

1.3.2: Eligibility Criteria

Population

Included articles were based on studies that examined staff attitudes towards cCBT for depression, anxiety, or comorbid depression and anxiety. The population consisted of medical, mental health, or support staff working with individuals across the lifespan. As the focus of the review was staff attitudes to cCBT within the general population, studies examining attitudes of clinicians working within

specialist services (e.g. learning disabilities, forensic populations) were excluded (e.g. Vereenooghe, Gega, & Langdon, 2017).

Following the database and manual searches, numerous studies were identified that did not report the age-ranges of patients with whom clinicians worked ($n = 6$). Corresponding authors from each study were therefore contacted via e-mail (see Appendix 2) to ask for this information. Five authors replied, with three supplying the required information. The remaining two authors indicated that they had not assessed this variable in their studies. For those who did not reply ($n = 1$), or for whom the data was missing ($n = 2$), a separate section of the review was compiled.

cCBT interventions

As emphasised in the introduction, considerable confusion currently exists regarding precise definition of computerised CBT (Barak et al., 2009). Within the present review, cCBT is defined as any online or computer-assisted program that utilises a CBT intervention. This includes both standalone or embedded cCBT (i.e. combined with face-to-face therapy). Studies examining attitudes towards either type of treatment were therefore included in the current review.

The initial search strategies identified a range of studies examining ‘eHealth’ (e.g. Olok et al., 2015), defined as ‘the cost-effective and secure use of ICT in support of health and health-related fields’ (World Health Organisation, 2004). Although some of these studies examined attitudes towards cCBT (e.g. Donovan et al., 2015), others examined alternative eHealth modalities, such as online appointment systems (e.g. Almunawar, Wint, Low, & Anshari, 2012). Similarly, numerous studies examined attitudes to generic web- or internet-based psychological

therapies (e.g. Topooco et al., 2017), including online psychodynamic therapy (Zwerenz et al., 2017). As attitudes towards different types of therapy may vary between clinicians (Leahy, Holland, & McGinn, 2012), only studies examining cCBT were included.

Outcomes

Any outcome measures that assessed attitudinal variables towards cCBT (e.g. satisfaction ratings, reported concerns) were included in the current study.

Study design

Quantitative and qualitative studies were eligible for inclusion in the current review, regardless of the methodology that was employed. In contrast, review articles were excluded (cf. Reardon et al., 2017). Following Cochrane guidelines (Hannes, 2011), editorials and opinion papers were also excluded (e.g. Fox, Acton, Wilding, & Corcoran, 2004).

1.3.3: Study selection

The titles and abstracts of the 1198 identified studies were screened for inclusion eligibility based upon the exclusion and inclusion criteria detailed above. A visual representation of the study selection process is illustrated in Figure 1.1. This resulted in the full text of 89 studies being examined for eligibility, of which 74 were excluded for reasons detailed in Figure 1.1 (e.g. study examining perceptions of generic ‘web-based psychotherapy’ rather than cCBT). The lead researcher and two

of her supervisors (KP and EQ) discussed the suitability of shortlisted studies, with unanimous agreement between all members of the research team.

1.3.4: Data extraction

A data extraction spreadsheet was specifically designed for this review, piloted on one study (Newton & Sundin, 2016), and modified based on the results of the pilot (separate section added on analysis of advantages and disadvantages of cCBT). Key characteristics and data from each of the identified studies were extracted and summarized in Tables 1.1, 1.2, and 1.5, including: author, publication year, country of study, sample size, study methodology, intervention programme, main findings, and any perceived advantages or disadvantages reported by staff.

1.3.5: Thematic analysis

In order to determine perceived advantages and disadvantages of cCBT across studies, a data-driven thematic analysis approach (Braun & Clark, 2006) was employed. This employed a six phase model for the identification of advantages and disadvantages: 1) immersing self in the data through multiple readings of the articles, whilst searching for meanings, similarities and patterns in the data; 2) generating initial codes based on features of the data; 3) sorting the codes into possible themes; 4) refining and reviewing identified themes, checking for accuracy against the initial codes, and generating a thematic map of the data; 5) define, name and refine the themes and 6) tell the story of the data through producing a report, and select extracts to illustrate the themes. As the current methodology consisted of a secondary analysis of existing data (i.e. themes previously identified by study authors),

wherever possible the original theme names were retained in the current analysis, although this often involved minor rewording of the initial names to facilitate ease of comparison across studies (e.g. ‘Not individualised’; Varley, 2011, p. 72 reworded to ‘Lack of individualised approach’ in the current analysis).

1.3.6: Quality assessment

Guidance on the assessment of quality of studies included in systematic reviews emphasise utilising assessment tools that are multidimensional and are based upon a checklist approach (CRD, 2009; Hannes, 2011). As studies identified through our search strategy employed a range of methodologies, a further consideration was the use of an assessment tool that permitted an evaluation of both qualitative and quantitative designs. Cochrane guidelines (Hannes, 2011) on the assessment of qualitative studies stipulate that quality assessments should include evaluation of: quality of reporting (including data sampling, collection and analysis); methodological vigour, and conceptual depth and breadth. In contrast, assessment of quality in quantitative methodologies should assess: risk of bias, selection of designs appropriate to the research objective, choice of outcome measures, statistical issues, quality of the intervention and generalizability (CRD, 2009). These guidelines also recommend that a distinction should be drawn between the quality of the empirical work and the quality of the reporting, as failing to report specific aspects of design methodology does not equate to relevant methods not being used (see Soares et al., 2004).

Based on these considerations, an assessment tool was selected that assessed each of the above quality criteria, and allowed for complimentary assessment of

multiple study designs (Kmet, Lee, & Cook, 2004). This tool consists of two checklists, one for quantitative and one for qualitative designs, and demonstrated acceptable to high inter-rater reliability scores in the original paper (i.e. 60-100%; Kmet, Lee, & Cook, 2004)⁴. The quantitative checklist consists of 14 items (e.g. ‘Design evident and appropriate to answer question’), whereas the qualitative checklist consists of 10 items (e.g. ‘Reflexivity of the account’). Items from both checklists are scored on a 3-point scale (where *yes* = 2, *partial* = 1, and *no* = 0), plus a ‘Not applicable’ option for quantitative items (e.g. random allocation to conditions). Summary scores are calculated by dividing the total score for each study by the total possible score, resulting in maximum summary scores of 1 for both checklists.

Any studies employing a mixed-methods design were evaluated in the current review using both checklists. Clear guidelines for allocating scores for each item are included with the tool (see Appendix 3). In order to address issues of relevance to our research questions, the qualitative checklist was modified (cf. Reardon et al., 2017) to differentiate between studies that used multiple to no verification procedures (e.g. member checks). An item was also added to each checklist to assess the reporting of quality of each study (cf. CRD, 2009; see Appendix 3.2). The quality of each study was assessed by the first author (JP), with four papers (26.7%) randomly selected for quality assessment by an independent reviewer. Cohen’s kappa (Cohen, 1960) was calculated to determine inter-rater reliability for this

⁴ NB inter-rater agreement scores were lower for the quantitative checklist (40-100%). The checklist items were modified following this analysis, however, but subsequent inter-rater reliabilities were not provided.

process ($\kappa = .80$, 95% CI [0.68, 0.93]), which demonstrated a strong level of agreement (McHugh, 2012). Any disagreements were resolved through discussion.

1.4: Results

1.4.1: Characteristics of included studies

In total, 15 studies were included in the review, with 10 providing qualitative data, five providing quantitative data, and two providing both (see Tables 1.1 - 1.2). One study (Kuosmanen, Fleming, & Barry, 2017) adopted a mixed-methods approach, but only the qualitative aspect of the study referred to cCBT. It was therefore classified as providing qualitative data. Studies varied on a range of characteristics, including country of origin, methodological design, staff professional grouping (e.g. Clinical Psychologist, Social Worker), age of population with whom clinicians worked (see Table 1.1). Across the 15 studies, staff attitudes towards a range ($n = 13$) of specific programmes were assessed (e.g. Beating the Blues; BtBs), with one study assessing attitudes towards generic cCBT, and three studies assessing attitudes towards both generic cCBT and specific programmes (see Table 1.1).

Studies employing qualitative methodologies tended to have utilised focus group designs or semi-structured interviews, with a minority employing open-ended questionnaire measures (e.g. Varley, 2011). In contrast, the majority of quantitative studies employed questionnaire designs (e.g. Carper, McHugh, & Barlow, 2013). The amount of data relevant to answering our research questions varied across studies, with assessment of staff attitudes constituting a small proportion of some

Figure 1.1: Flowchart of literature search process

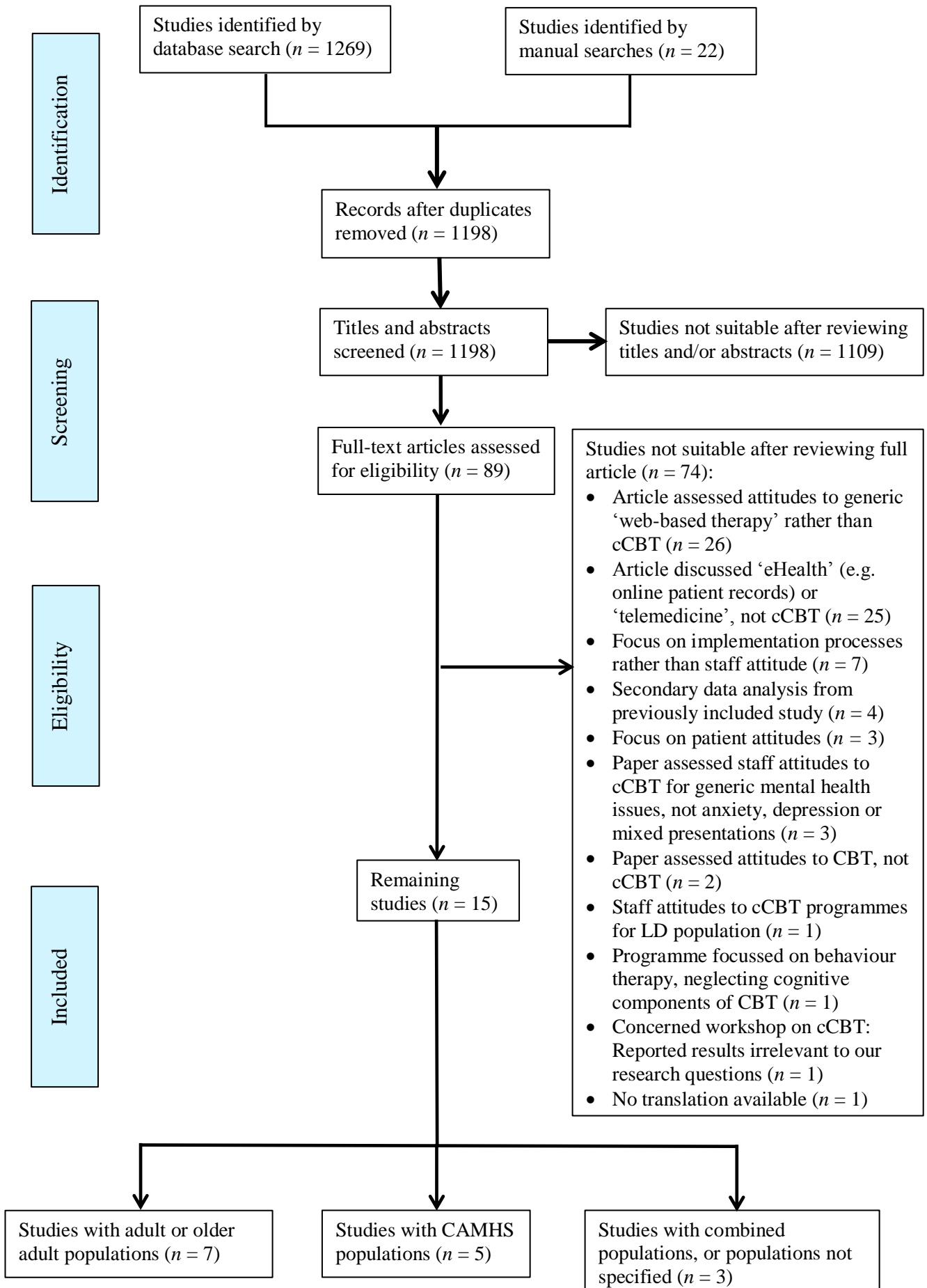


Table 1.1: *Study and sample characteristics from included studies*

Authors and year	Country	cCBT programme	Presenting problems	Staff group	<i>n</i> (% female)	Response rate (%)
Adult populations						
Friesen et al. (2014)	Canada	The Wellbeing course	Anxiety and/or depression	Trainee clinical psychologists	12 (-)	-
Gellatly et al. (2017)	England	OCFighter	OCD	PWPs	20 (90.0)	28.2
MacGregor et al. (2009)	Scotland	Fear Fighter	Anxiety disorders	-	15 (-)	57.7
Newton & Sundin (2016)	England	Generic cCBT Beating the Blues	Depression	BABCP accredited therapists	12 (66.7)	<10.0 ^a
Robertson et al. (2006)	Australia	Recovery Road	Depression	Mental health professionals ^a	-	-
Varley (2011)	Scotland	Generic cCBT	Anxiety and/or depression	Mental health professionals: - Psychologists (e.g. clinical, CAAPs). - GPs - Nurses	72 (-)	21.4
Wilhelmsen et al. (2014)	Norway	Moodgym (translated)	Depression	GPs	11 (81.8)	-
CAMHS populations						
Baror (2010)	USA	Cool Teens CD-Rom	Anxiety	Psychologists: - Clinical - Counselling - 'Other'	43 (-)	-
Brezinka (2010)	Switzerland	Treasure Hunt	Various MHPs, including anxiety and depression	Child psychiatrists Clinical psychologists	124 (-) ^b 42 (-) ^c	31.7 23.9
Fleming & Merry (2013)	New Zealand	Generic cCBT SPARX	Depression	Youth workers	40 (40.0)	-

Kuosmanen et al. (2017)	Ireland	Moodgym SPARX	Anxiety and/or depression	Youthreach staff: - Coordinators - Teachers - Trainees	12 (75.0)	-
Salloum et al. (2015)	USA	Camp-cope-a-lot	Anxiety disorders	Various, including: - Administrators - Project coordinators - Therapists	9 (88.9)	-
Mixed or does not specify population						
Alberts et al. (2017)	Canada	Wellbeing after cancer	Anxiety and/or depression	Social workers	10 (100)	38.5
Donovan et al. (2015)	Australia	Generic cCBT BRAVE	Various MHPs, including anxiety and depression	Mental health workers, including: - Clinical psychologists - Social workers - Nurses	124 (-)	-
Jones & Ashurst (2013)	UK	Generic cCBT Living Life to the Full Moodgym	Depression	Mental health professionals: - Nurses - Occupational therapists - Clinical psychologist	19 (68.4)	82.6

Note. - = Not assessed or reported in study; PWPs = Psychological Well-being Practitioner; BABCP = British Association for Behavioural and Cognitive Psychotherapists; CAAPs = Clinical Associate in Applied Psychology; GPs = General Practitioners.

^aFurther details not provided; ^btime one, first impression of programme; ^ctime two, post-use of programme.

Table 1.2: *Characteristics and main acceptability and future use ratings from included studies*

Authors	Method	Analysis approach	Main findings (and implications)	
			Acceptability or suitability	Will use cCBT in future
Adult populations				
Friesen et al. (2014)	Interviews	Thematic content	-	-
Gellatly et al. (2017)	Interviews	Thematic analysis	-	a
MacGregor et al. (2009)	Questionnaire	Descriptive statistics	1. Staff reported cCBT was suitable: 100% 2. Staff reported patients had improved \geq "to some extent": 75%	-
Newton & Sundin (2016)	Questionnaire	Thematic analysis	1. Qualitative report that is appropriate for depression ^b 2. Qualitative report that is suitable when used as part of embedded approach ^b	-
Robertson et al. (2006)	Questionnaire	Descriptive statistics	1. Staff reported had helped relationship with patients ^c : 86% 2. Staff reported satisfaction with programme ^c : 100%	-
Varley (2011)	Questionnaire	Descriptive statistics Correlation Framework thematic analysis	1. Staff reported 'approved' or 'really approved' of cCBT: 66.7%	If appropriate, how often will you refer to cCBT: 1. Always: 1.4% 2. Often: 6.9% 3. Fairly often: 37.5% 4. Sometimes: 22.2% 5. Occasionally: 16.7% 6. Rarely: 13.9% 7. Not at all: 1.4%
Wilhelmsen et al. (2014)	Interviews	Thematic analysis	-	-
CAMHS populations				
Baror (2010)	Questionnaire	Descriptive statistics	1. Staff reported it was 'likely' or 'very likely' that an adolescent would benefit	How likely is it that you would use the Cool Teens CD with no face-to-face

			from using Cool Teens CD: 56.1%	contact and biweekly phone contact only? 1. Less likely: 95.3% 2. More likely: 4.7%
				How likely is it that you would use the Cool Teens CD if you were also seeing the individual in face-to-face therapy? 1. Less likely: 41.9% 2. More likely: 58.1%
Brezinka (2010)	Questionnaire	Descriptive statistics	1. Staff reported was useful tool: 95.2%	-
Fleming & Merry (2013)	Interviews Focus groups	General inductive approach	1. Qualitative reports that cCBT would be useful ^b	No participants indicated that they would not use it.
Kuosmanen et al. (2017)	Interviews Focus groups	Requirements development approach	-	-
Salloum et al. (2015)	Interviews	Thematic analysis	-	-
Mixed or does not specify population				
Alberts et al. (2017)	Interviews	Thematic content analysis	1. All staff reported cCBT programme was useful or beneficial	-
Donovan et al. (2015)	Questionnaire	Descriptive statistics	-	Would you use a cCBT programme with your clients, if it were available? ^c 1. Definitely yes: 13.7% 2. Most likely: 32.3% 3. Possibly: 42.7% 4. Unsure: 6.5% 5. Definitely not: 4.8%
Jones & Ashurst (2013)	Transcripts	Thematic analysis	-	-

Note. cCBT = computerised cognitive behaviour therapy; CAMHS = Child and Adolescent Mental Health Service; CD = compact disc.

^aAssessed but not reported in article; ^bProportion of staff expressing view not provided; ^cExact wording of question not provided.

studies (e.g. MacGregor, Hayward, Peck, & Wilkes, 2009), versus being the primary focus of others (e.g. Varley, 2011).

1.4.2: Quality of included studies

Quality of included studies was assessed on the basis of each study's ability to answer *our* research questions regarding staff attitudes towards cCBT. It should be noted that this question was often subsidiary to the main research question of the specific study (e.g. patient attitudes towards cCBT; Robertson, Smith, Castle, & Tannenbaum, 2006). This analysis therefore does not assess the generic quality of the studies in question, but rather their quality related to the research questions detailed above.

Tables 1.3 - 1.4 present the results of the methodological quality assessment for each of the 15 included studies. Results demonstrated variability across the study criteria. Maximum possible criterion scores for individual rating items were 2.0, with maximum summary scores of 1.0 for both checklists. Summary scores for each study ranged from 0.55 to 0.86 for the qualitative studies or data ($M = 0.76$, $SD = 0.11$), versus 0.29 to 0.88 ($M = 0.57$, $SD = 0.21$) for the quantitative studies or data, indicating variability across studies. For the qualitative data, the highest scoring studies (Alberts, Hadjistavropoulos, Titov, & Dear, 2017; Fleming & Merry, 2013; Varley, 2011) tended to have clearly defined research questions or objectives, and to have used multiple verification procedures (with the exception of Varley, 2011) in comparison to the lowest scoring studies (Baror, 2010; Jones & Ashurst, 2013).

Some aspects of methodological quality were adequately addressed, with each study, for example, employing suitable designs to answer their study questions

Table 1.3: *Methodological quality assessment of qualitative studies using Kmet and colleagues' (2004) checklist*

Criteria	Included studies											<i>M</i>	<i>(SD)</i>
	Alberts et al. (2017)	Baror (2010)	Fleming & Merry (2013)	Friesen et al. (2014)	Gellatly et al. (2017)	Jones & Ashurst (2013)	Kuosmanen et al. (2017)	Newton & Sundin (2016)	Salloum et al. (2015)	Varley (2011)	Wilhelmsen et al. (2014)		
1. Question/objective clearly described?	2	1	1	1	1	1	2	2	2	2	2	1.55	(0.52)
2. Design evident and appropriate to answer study question?	2	2	2	2	2	2	2	2	2	2	2	2.00	(0.00)
3. Context for the study is clear?	2	2	2	1	2	1	1	1	1	2	2	1.55	(0.52)
4. Connection to theoretical framework / wider body of knowledge?	2	1	1	2	1	1	2	1	2	1	2	1.45	(0.52)
5. Sampling strategy described, relevant and justified?	1	2	2	1	1	1	2	1	1	2	1	1.36	(0.50)
6. Data collection methods clearly described and systematic?	2	2	2	2	2	2	1	1	2	2	2	1.82	(0.40)
7. Data analysis clearly described, complete and systematic?	2	0	2	2	2	2	2	2	1	2	2	1.73	(0.65)
8. Use of verification procedure (s) to establish credibility?	2	0	2	2	2	1	1	1	2	0	2	1.36	(0.81)
9. Do the results support the conclusions?	2	1	2	1	2	1	1	1	2	2	2	1.55	(0.52)
10. Reflexivity of the account?	1	0	1	2	2	1	0	2	0	2	1	1.09	(0.83)
11. Write up	1	1	2	2	0	0	2	1	2	2	0	1.18	(0.87)
Summary score	0.86	0.55	0.86	0.82	0.77	0.59	0.73	0.68	0.77	0.86	0.82	0.76	(0.11)

(M criterion score = 2.0, $SD = 0$) and utilising systemic and replicable data collect methods ($M = 1.82$, $SD = 0.40$). In contrast, other aspects were less well addressed, with the lowest score emerging for reflexivity of the accounts ($M = 1.09$, $SD = 0.83$) and the quality of reporting ($M = 1.18$, $SD = 0.87$).

For the quantitative studies, the highest scoring studies (Donovan et al., 2015; Varley, 2011) demonstrated recruitment strategies aimed at reducing bias in the sample (e.g. approaching all clinicians within available services (Varley, 2011) and reported relevant and potentially confounding characteristics of their samples (e.g. theoretical orientation; Donovan, 2015), whereas the lowest scoring studies (Baror, 2010; MacGregor et al., 2009) showed a tendency to rely on convenience sampling. As with the qualitative data, reporting of quantitative studies tended to show low quality (see Table 1.4), with over half of the studies failing to report key aspects of methodological design (e.g. age of clients with whom clinicians worked (e.g. MacGregor et al., 2009).

1.4.3: Perceived acceptability or suitability of cCBT

Eight studies (53.3%) reported data on staff perceptions of the acceptability or suitability of cCBT for anxiety, depression, or comorbid presentations (see Table 1.2), with three employing qualitative analyses and five quantitative. As indicated in Table 1.2, data usually consisted of the proportion of staff that perceived cCBT to be beneficial for these conditions (e.g. Brezinka, 2010), or the *extent* to which staff perceived cCBT to be appropriate (Newton & Sundin, 2016) or helpful (Robertson et al., 2006). In all cases, the majority of staff reported positive perceptions of the suitability of cCBT for depression and anxiety, although the proportion of those

Table 1.4: Methodological quality assessment of quantitative studies using Kmet and colleagues' (2004) checklist

Criteria	Studies						<i>M</i>	<i>(SD)</i>
	Baror (2010)	Brezinka (2010)	Donovan et al (2015)	MacGregor et al (2009)	Robertson et al (2006)	Varley (2011)		
1. Question or objective sufficiently described?	1	1	2	1	1	2	1.33	(0.52)
2. Design evident and appropriate to answer study question?	2	1	2	1	1	2	1.50	(0.55)
3. Method of subject selection or source of information/input variables is described and appropriate?	1	2	1	1	1	2	1.33	(0.52)
4. Subject characteristics or input variables/information sufficiently described?	1	1	2	1	0	2	1.17	(0.75)
5. If random allocation to treatment group was possible, is it described?	-	-	2	-	-	-	2.00	(0.00)
6. If interventional and blinding of investigators to intervention was possible, is it reported?	-	-	0	-	-	-	0.00	(0.00)
7. If interventional and blinding of subjects to intervention was possible, is it reported?	-	-	-	-	-	-	-	-
8. Outcome and (if applicable) exposure measure(s) well defined and robust to measurement / misclassification bias? Means of assessment reported?	2	1	2	1	0	2	1.33	(0.82)
9. Sample size appropriate?	1	2	2	1	0	1	1.17	(0.75)
10. Analysis described and appropriate?	2	1	1	1	1	2	1.33	(0.52)
11. Some estimate of variance is reported for main results/outcomes (i.e., those directly addressing the question/objective upon which the conclusions are based)?	1	1	2	1	0	1	1.00	(0.63)
12. Controlled for confounding?	0	1	0	0	0	1	0.33	(0.52)
13. Results reported in sufficient detail?	0	1	1	1	1	2	1.00	(0.63)
14. Do the results support the conclusions?	1	1	2	2	2	2	1.67	(0.52)
15. Write up	0	1	1	0	0	2	0.67	(0.82)
Summary score (<i>SD</i>)	0.50	0.58	0.71	0.46	0.29	0.88	0.57	(0.21)

expressing positive views varied across studies, ranging from 56.1% (Baror, 2010) to 100% (Alberts, 2017; MacGregor et al., 2009). These results are similar to patients' ratings of the acceptability of cCBT (for reviews, see Bowyer, 2017; Kalthenthaler et al., 2008), which also reported positive perceptions.

1.4.4: Do staff intend to use cCBT in the future?

Few studies ($n = 4$; 26.7%) examined staff members' intention to use cCBT in the future. One additional study examined this variable, but did not provide relevant findings in their results section (Gellatly et al., 2017). Due to the heterogeneity across studies over assessment of this variable (i.e. use of different questions and a variety of rating scales; see Table 1.2), direct comparison proved somewhat problematic (Field, 2005). Despite this, few clinicians indicated that they would definitely not use cCBT in the future (range 0 – 4.8%; see Table 1.2). A higher proportion of staff indicated their intention to use the intervention equal to or more frequently than 'fairly often' (45.8%; Varley, 2011) and that they would be 'most likely' or would 'definitely' use cCBT (46%; Donovan et al., 2015). With just two studies utilising such scales, however, the generalizability of this finding must be treated with caution.

Of note, the study by Baror (2010) differentiated between using cCBT in conjunction with face-to-face or telephone contact. When this differentiation was made, the vast majority of participants (95.3%) indicated that they would be unlikely to combine cCBT with telephone contact, in comparison to almost 60% who would be more likely to use it in combination with face-to-face contact. As no other study made this differentiation, the reliability of this finding is difficult to comment on.

Overall, consideration of the studies collectively suggests that clinicians were willing to use cCBT, yet some ambivalence was evident.

1.4.5: Does any consistency emerge over staff's perceptions of advantages or disadvantages regarding cCBT?

As indicated in Table 1.5, a range of advantages and disadvantages regarding cCBT were identified by staff from our identified studies. Thematic analysis (Braun & Clarke, 2006) indicated that these fell into four main themes: Patient-related factors, staff-related factors, organisational context, and practicalities regarding the use of cCBT. Varying numbers of subthemes (range = 3 to 9) arose within these four, overarching categories (see Table 1.5). The lead researcher initially identified each theme and subtheme, with an independent reviewer checking the classifications. Agreement on both classification types was high (100% and 89.1%, respectively). Any disagreements were resolved through discussion.

The total number of advantages versus disadvantages generated within each theme was calculated (i.e. number of times each theme was identified across studies). Interestingly, across the four themes, the highest number of items generated related to patient factors for both advantages ($n = 31$) and disadvantages ($n = 34$). In total, 24 (46.2%) subthemes were identified relating to advantages of cCBT (see Table 1.5), in comparison to 28 (53.8%) disadvantages. In line with previous research (e.g. Whitfield & Williams, 2004), this suggests that studies and participants included in the current review demonstrated ambivalent attitudes towards cCBT.

In terms of consistency of responses, the majority of subthemes ($n = 33$; 63.5%) were identified by more than one study. In terms of the most common perceived

Table 1.5: Characteristics and findings regarding perceived advantages and disadvantages of cCBT from included studies

Themes	<i>n</i> studies	Studies	Example data extraction
Advantages			
Patient-related factors	31		
1. Increases access to therapy: a. For patients with specific characteristics (including physical mobility and social anxiety issues, lower symptom severity, etc.)	6	Fleming & Merry (2013) Friesen et al. (2014) Kuosmanen et al. (2017) Jones & Ashurst (2013) Newton & Sundin, (2016) Varley (2011)	<i>'I do think it's a good service for certain clients.'</i> (Friesen et al., 2014; p.44). <i>'I have dealt with a number of students this year who might benefit from this. They wouldn't go to [mental health service] but would do something. They are into computers.'</i> (Fleming & Merry, 2013; p.271)
b. For those with practical difficulties (e.g. rural location, hectic or busy lives)	3	Alberts (2017) Friesen et al. (2014) Varley (2011)	<i>'Well, definitely the availability of it to anybody, no matter where you live. I know we work with a lot of rural people... they don't want to travel for more therapy or whatever, so something that they can do at home.'</i> (Alberts, 2017; p.601).
2. Increased flexibility of appointments or access (e.g. time and location)	4	Alberts et al. (2017) Gellatly et al. (2017) Varley (2011) Wilhelmsen et al. (2014)	<i>'I think that if people were able to access that and work on that much more freely... Especially for people who may be working during the day, or need to be able to access something at a time convenient for them'</i> (Gellatly et al., 2017; p.5)
3. Offers patients choice over therapy options	4	Fleming & Merry (2013) Gellatly et al. (2017) Kuosmanen et al. (2017) Varley (2011)	<i>'Gives patients increased choice if offered as one of a range of suitable options'</i> (Varley, 2011; p.70).
4. Reduces stigma and offers normalisation	4	Alberts et al. (2017) Friesen et al. (2014) Newton & Sundin (2016) Varley (2011)	<i>'I think the existence of a program for self-help... [may help the patient] realize that they are not alone and others have similar problems.'</i> (Newton & Sundin, 2016; p.6).
5. Empowers patients and/or increases autonomy	4	Fleming & Merry (2013) Salloum et al. (2015)	<i>'They had a lot of ownership in the program. They were sitting at the computer, they were the ones doing this, it wasn't being done to</i>

		Varley (2011)	<i>them, so I think that was very powerful.</i> (Salloum et al. 2015; p.36)
		Wilhelmsen et al. (2014)	
6. Gateway to, or prepares individual for, additional support (e.g. face-to-face therapy)	2	Fleming & Merry (2013) Newton & Sundin (2016)	<i>'And it's good because they get stuff from here and then probably go on to the next level, by meeting each other face to face. This could be like a starting, then you could elaborate.'</i> (Fleming & Merry, 2013; p.271).
7. Increases patient anonymity/privacy	2	Gellatly et al. (2017) Kuosmanen et al. (2017)	<i>'I guess with accessing an online programme... there's a slightly more anonymous aspect to it, and I think some people prefer that.'</i> (Gellatly et al., 2017).
8. Increases motivation and strengthens therapeutic relationship	1	Brezinka (2010)	Summary: p.106
9. Suitable for a wide age-range of children	1	Salloum et al. (2015)	Summary: p.36
Staff-related factors	24		
1. Useful tool to supplement face-to-face therapy	6	Alberts et al. (2017) Brezinka (2010) Kuosmanen et al. (2017) Newton & Sundin, (2016) Varley (2011) Wilhelmsen et al. (2014)	<i>'So it is, it's nice to have a tool to offer people. That in itself makes you feel better as a caregiver!'</i> (Wilhelmsen et al., 2014; p.10) <i>"I think it can be offered as a useful adjunct to therapy (not necessarily as a sole option)"</i> (Varley, 2011; p.72)
2. Provides psycho-education and socialisation to CBT model	6	Alberts et al. (2017) Brezinka (2010) Kuosmanen et al. (2017) Newton & Sundin, (2016) Varley (2011) Wilhelmsen et al. (2014)	<i>'BtB could provide psychoeducation while people are on waiting lists – to get the ball rolling.'</i> (Newton & Sundin, 2016; p.6)
3. Increases staff expertise and confidence with CBT	5	Fleming & Merry (2013) Friesen et al. (2014) Gellatly et al. (2017) Salloum et al. (2015) Wilhelmsen et al. (2014)	<i>'I have to speak to what a good training experience this was for me because I loved the modules for that reason'</i> (Friesen et al. 2014, p.45) <i>"To me it felt very good [to learn ICBT]! Because now I finally felt I had some treatment I could try."</i> (Wilhelmsen et al. 2014, p.10)

4. Requires less clinician time than tCBT (i.e. time-efficient)	3	Friesen et al. (2014) Salloum et al. (2015) Varley (2011)	<i>'I like that it's all in one spot. You can have all your materials, your games, everything like an entire office in a computer program so it makes preparation time for a session a lot less.'</i> (Salloum et al. 2015)
5. Facilitates face-to-face communication	2	Fleming & Merry (2013) Wilhelmsen et al. (2014)	<i>'Be good for young people who don't have the words for what they are feeling'</i> (Fleming & Merry, 2013; p.271)
6. Enables monitoring of patients' use	1	Friesen et al. (2014)	<i>'That's been great because I open up two windows and I go through the module to see what it was that they were seeing that week'</i> (p.271)
7. Reported benefit of programme including parents as active participants	1	Salloum et al. (2015)	Summary: p.37
8. Useful for relapse prevention	1	Jones & Ashurst (2013)	Summary: p.284
Organisational context	9		
1. Effective, evidence-based treatment	5	Friesen et al. (2014) Robertson et al. (2006) Salloum et al. (2015) Varley et al. (2011) Wilhelmsen et al. (2014)	Summary: (Wilhelmsen, p.11)
2. Earlier access to therapy that could facilitate reduction in waiting lists	2	Friesen et al. (2014) Varley (2011)	<i>'[cCBT] could be offered to people while on a waiting list after assessment'</i> (Varley, 2011; p. 70).
3. Cost-effective treatment option	1	Varley (2011)	<i>"It's a cost effective way of offering treatment to patients with mild- moderate mental illness"</i> (p. 70)
4. Fills a gap in existing services; helps prevent patients from being missed	1	Alberts (2017)	<i>'So unless somebody contacts me, I don't know that anyone's out there that needs help, but if you have that online program, you would get that contact.'</i> (p.601)
Programme practicalities	15		
1. Engaging, interactive medium and user-friendly programmes	7	Friesen et al. (2014) Gellatly et al. (2017) Kuosmanen et al. (2017) Fleming & Merry (2013)	<i>'I think with them having a smart phone in their hand at all times, it would be a shame not to do it that way.'</i> (Kuosmanen et al., 2017; p.7). <i>'...particularly appealing to new generation of folks used</i>

		Wilhelmsen et al. (2014) Salloum et al. (2015) Varley (2011)	<i>to this type of communication</i> ' (Varley, 2011; p.72)
2. Manualised, structured or organised approach	6	Alberts et al. (2017) Brezinka (2010) Friesen et al. (2014) Gellatly et al. (2017) Wilhelmsen et al. (2014) Salloum et al. (2015)	<i>'... it is very systemic and built up in a good way with the different modules...'</i> (Wilhelmsen et al., 2014; p.10) <i>'I think having a very clear package of information, it [trial interventions] clearly defined what to focus on in particular sessions'</i> (Gellatly et al. 2017, p.7)
3. Practical benefits: a. Email correspondence allows therapists additional reflection time b. Enables patients to revisit completed sessions.	2	Friesen et al. (2014) Gellatly et al. (2017)	<i>'What I really liked was that I didn't have to respond to him right away and I had a chance to walk away and regroup and then come back fresh and really think about it.'</i> (Friesen et al., 2014; p. 45).

Disadvantages

Patient-related factors	35		
1. Not suitable for all patients (e.g. high complexity, OCD diagnosis, low motivation)	9	Alberts (2017) Fleming & Merry (2013) Friesen et al. (2014) Gellatly et al. (2017) Kuosmanen et al. (2017) Newton & Sundin (2016) Salloum et al. (2015) Varley (2011) Wilhelmsen et al (2014)	<i>'I think for some people it's really good, but for the other people it's just not. It seems like the more complex problems clients have, you know just the harder it is.'</i> (Friesen et al., 2014; p.45) <i>'For the depression clients, who are more severe, I found that they tend to take way longer... there's less motivation... those clients, maybe it would be better for them to see somebody in person because there's a lot of other issues.'</i> (Friesen et al., 2014, p.44)
2. Lack of or reduced therapeutic relationship, particularly in comparison to face-to-face therapy	7	Baror (2010) Fleming & Merry (2013) Friesen et al (2014) Gellatly et al. (2017) Newton & Sundin (2016)	<i>'An essential part of CBT of course is the therapeutic relationship... BtB does not provide these features.'</i> (Newton & Sundin, 2016; p.5)

		Varley (2011)	
		Wilhelmsen et al. (2014)	
3. Lack of individualised approach	5	Gellatly et al. (2017) Kuosmanen et al. (2017) Newton & Sundin (2016) Salloum et al. (2015) Varley (2011)	<i>'CCBT may not be tailored to the individual'</i> (Varley, 2011; p. 72)
4. Dependent on patient motivation	4	Alberts (2017) Friesen et al (2014) Varley (2011) Wilhelmsen et al. (2014)	<i>'People need to be organised and self motivated - unsuitable if chaotic lifestyle.'</i> (Varley, 2011; p. 72)
5. Possible patient dissatisfaction with treatment modality.	4	Fleming & Merry (2013) Newton & Sundin (2016) Varley (2011) Wilhelmsen et al. (2014)	<i>'Patients may feel fobbed off by being offered this'</i> (Varley, 2011; p. 72)
6. Reduced clinical information from patient (e.g. body language)	3	Friesen et al. (2014) Gellatly et al. (2017) Newton & Sundin (2016)	Summary: (Newton & Sundin, 2016; p.5)
7. Use worsens patients' presentation, or reduces willingness to engage in face-to-face contact	2	Fleming & Merry (2013) Jones & Ashurst (2013)	<i>'I wonder about how many people we might "turn off" to therapy, by, in effect, selling them short... I believe if we disappoint or cause people to become therapy averse, we may well have been better off offering nothing!'</i> (Jones & Ashurst, 2013)
8. Limited patient awareness of programmes	1	Alberts (2017)	Summary, p.601
Clinician-related factors	12		
1. Assessment and management of risk and deterioration	4	Alberts (2017) Fleming & Merry (2013) Newton & Sundin (2016) Varley (2011)	<i>'If you had someone who, all of a sudden, was suicidal. I mean, with an online program, how do you put the safety checks in there for those kind of things?'</i> (Alberts et al., 2017; p.601)
2. Require clinician support (standalone not appropriate)	3	Fleming & Merry (2013) Jones & Ashurst (2013)	<i>'I was a bit worried in case that wasn't enough support for the person...'</i> (Gellatly et al., 2017; p.6)

3. Potential issues surrounding confidentiality of programmes	1	Kuosmanen et al. (2017) Kuosmanen et al. (2017)	Summary: p.6
4. Clinician dissatisfaction with their role: technical support rather than therapeutic	1	Gellatly et al. (2017)	<i>'You felt a bit like you were just technical support, if you see what I mean... I just prefer to be sitting talking to people.'</i> (p. 8)
5. Fears regarding potential loss of role	1	Fleming & Merry (2013)	<i>'I hope it doesn't come to a place where it replaces us!'</i> (p.272)
6. GPs reported insufficient time in consultations to sufficiently utilise	1	Wilhelmsen et al. (2014)	<i>"You already have so little time in the consultation in general practice... It [guided ICBT] isn't done in 20 minutes"</i> (p.12)
7. Time-consuming for clinicians: Email contact produced varying and unpredictable time demands, and time delays between email contact extended therapy duration	1	Friesen et al. (2013)	Summary: (Friesen et al., 2013; p.46).
Organisational context	16		
1. Time-consuming from service-development perspective: a. Time required for staff training and familiarisation with programme b. Resolution of technical glitches	6	Fleming & Merry (2013) Friesen et al. (2013) Gellatly et al. (2017) Kuosmanen et al. (2017) Salloum et al. (2015) Wilhelmsen et al. (2014)	<i>'It takes a little bit to learn and it takes a time investment... I'm far from proficient. I think people need to understand that it takes a little while to get a hold of it'</i> (Friesen et al., 2013; p.46). Summary: (Salloum et al., 2015; p.37)
2. Less effectiveness than tCBT (e.g. due to lack of therapeutic relationship?)	4	Fleming & Merry (2013) Kuosmanen et al. (2017) Newton & Sundin (2016) Varley (2011)	<i>"CCBT only addresses symptoms (depression/anxiety) not the underlying cause (emotional neglect/abuse etc)... I would also be concerned that it would not be as effective as other forms of therapy..."</i> (Varley, 2011; p.72)
3. Expense of package	2	Gellatly et al (2017) Salloum et al. (2015)	<i>'I think the cost implications of the package [OCFighter] of our service probably would make it unlikely we'd be able to offer it.'</i> (Gellatly et al., 2017; p.6)
4. Organisation of administration	1	Varley (2011)	<i>'How would system be administered?'</i> (p.72)
5. Lack of clear ethical and legal guidelines for use	1	Baror (2010)	Summary: p.119
6. Potential liability issues	1	Baror (2010)	Summary: p.119

7. Few computerised treatment modalities available other than CBT	1	Jones & Ashurst (2013)	Summary: p. 284
Programme practicalities	16		
1. Practical barriers limit access (e.g. lack of computer or internet access, low literacy levels)	6	Alberts (2017) Fleming & Merry (2013) Jones & Ashurst (2013) Kuosmanen et al. (2017) Salloum et al. (2015) Varley (2011)	<i>'A majority of the folks I deal with... don't have access to a computer. That would be one drawback.'</i> (Alberts et al., 2017; p.601) <i>'So you really have to be conscious of the fact that they don't understand an awful lot of words,'</i> (Kuosmanen et al., 2017; p.45)
2. Potential for technical glitches that could reduce engagement	3	Gellatly et al. (2017) Kuosmanen et al. (2017) Varley (2011)	<i>'I had one guy, he had two laptops and a computer and they didn't work on any of them.... [you'd] think everything was okay and then they'd DNA.'</i> (Gellatly et al., 2017; p.7)
3. Specific mechanics of programme reduced patient engagement (e.g. Some modules too long/complex for patients; lost progress due to non-activity time outs)	3	Friesen et al (2014) Gellatly et al. (2017) Wilhelmsen et al. (2014)	Summary: (Friesen et al., 2014; p. 46)
4. No guidelines for who constitutes suitable referrals, and how should suitability be assessed?	2	Jones & Ashurst (2013) Varley (2011)	<i>'... [I'd worry] that I may refer the wrong type of person'</i> (Varley, 2011; p.72)
5. Existing programmes are awkward and not user-friendly	1	Jones & Ashurst (2013)	Summary: p. 284
6. Key aspects of CBT missing (e.g. formulation, improving understanding of previous lack of progress)	1	Newton & Sundin (2016)	<i>'cCBT cannot provide some of the things that CBT centers around... [for example] mindfulness for recurrent depression.'</i> (Newton & Sundin, 2016; p.5)

Note. Some studies provided no (e.g. Brezinka, 2014) or few (e.g. Kuosmanen et al., 2017) direct quotations from their participants, so are under-represented in the above table. Summary = no direct quote provided by authors, so please see relevant page for authors' own summary descriptions.

advantages and disadvantages, only one subtheme emerged in over half of the studies: increasing patient access to psychological therapy, and conversely the limited suitability of cCBT for certain populations or groups (e.g. those with high symptom severity: see Table 1.5).

Equal to or over a third of included studies identified six advantages of cCBT: its usefulness in supplementing face-to-face therapy, including providing psycho-education and socialisation to the CBT model; increasing staff expertise with CBT; providing an effective, evidence-based treatment that is manualised and structured, and utilisation of an engaging medium. Examples of each of these subthemes are provided in Table 1.5. In terms of the disadvantages regarding cCBT, additional subthemes identified by over a third of studies related to: the reduced opportunity for a therapeutic relationship; reduced or no ability to provide an individualised approach, and time-consuming aspects of the programmes (e.g. staff familiarising themselves with relevant content; see Table 1.5).

1.5: Discussion

Depression and anxiety are currently widespread in society, yet the proportion of patients accessing psychological treatments is low (e.g. Lawrence et al., 2015). cCBT has been proposed as one potential method of increasing access to such therapies (Scottish Government, 2017). As service providers facilitate patient access to computerised therapies (Du et al., 2013), the current review aimed to provide an overview of staff attitudes towards cCBT for anxiety, depression, or comorbid anxiety and depression. Attitudes were divided into three domains, of perceived acceptability or suitability of cCBT for these conditions, staff's self-reported

intention to use cCBT in the future, and perceived advantages and disadvantages related to the use of computerised approaches.

Considering the small number of studies examining staff perceptions of cCBT (Newton & Sundin, 2016), our review employed a systematic search strategy that was inclusive in nature (e.g. no time limits placed on search parameters). A total of 15 relevant studies were identified that met all inclusion criteria. These examined attitudes across multiple professional groupings (e.g. GPs, psychologists, nurses) and employed qualitative, quantitative and mixed methodologies. The methodological quality of each study was assessed, with findings interpreted in the context of quality ratings.

In terms of perceived suitability of cCBT for depression and/or anxiety, approximately half of the studies included in this review assessed this variable. In each study, the majority of participants rated cCBT favourably. It is worth noting that two (MacGregor et al., 2009; Robertson et al., 2006) of the studies that demonstrated high ratings of acceptability were associated with low quality assessment scores. This suggests that these results should be interpreted with caution, as relevant rating scales for the measures were not provided. The same pattern was obtained in each of the eight studies, however, suggesting a relatively robust effect. The high acceptability scores also correspond to findings from previous reviews of patient attitudes towards computerised approaches (Bowyer, 2017; Kalthenthaler, 2008), which demonstrated high patient satisfaction levels with computerised therapies. This suggests that both patients and care providers view cCBT as an appropriate treatment option for anxiety and/or depression.

This interpretation is reinforced by our finding regarding clinicians' intentions to use cCBT in the future, where less than 5% of respondents across three studies (Donovan et al., 2015; Fleming & Merry, 2013; Varley, 2011) indicated that they would not use such interventions. This corresponds to findings from the wider literature regarding generic computerised approaches (as opposed to CBT specifically; e.g. Whitfield & Williams, 2004), and cCBT for unspecified mental health difficulties (rather than depression and/or anxiety specifically, e.g. Stallard et al., 2010). Similarly, approximately half of respondents in included studies indicated that they were likely to use cCBT in the future, which again corresponds to figures from the wider literature (Vigerland et al., 2014), and may reflect a willingness from clinicians to adopt novel approaches to therapy.

Finally, our current analysis revealed four main domains of perceived advantages and disadvantages of cCBT: patient-related factors, staff-related factors, organisational context and practical processes. Results also revealed consistent identification of subthemes across studies, as almost two thirds of the perceived advantages and disadvantages of cCBT emerged across five or more studies. This is despite the range of staff groups, specific cCBT programmes, and patient population ages that were included across studies, suggesting a robust finding in terms of consistency of attitudes. In line with previous research (e.g. Whitfield & Williams, 2004), findings indicated that staff held ambivalent attitudes towards cCBT, consisting of positive and negative perceptions, which were often contradictory in nature (e.g. that cCBT saves clinicians' time, yet is a time-consuming process; Friesen et al., 2014).

Interestingly, in line with previous studies (e.g. Stallard et al., 2010) a number of the disadvantages that were identified by staff do not correspond to the existing evidence base. For example, research has indicated that outcome from tCBT is equivalent to cCBT (Titov et al., 2015), and that positive therapeutic relationships emerge in embedded computerised approaches and are related to treatment outcome (Bergman Nordgren, Carlbring, Linna, & Andersson, 2013). Thus, some of the disadvantages that staff perceived regarding cCBT may relate to misperceptions or lack of awareness of the evidence base.

This has important clinical implications due to previous research demonstrating that positive attitudes towards cCBT (specifically, satisfaction with the programme and belief in its efficacy) predicted psychologists' referral rates to BtBs (Persson, Quayle & Power, 2017). Furthermore, as well as assessing attitudes towards cCBT, the study by Donovan and colleagues (2015) exposed participants to a 5-7 minute training video on computerised approaches. Results indicated that even such a short intervention exerted a significant and beneficial impact on staff attitudes towards and knowledge about cCBT (Donovan et al., 2015), although no longitudinal follow-up was conducted.

In combination, these two studies (Donovan et al., 2015; Persson et al., 2017) therefore suggest that improving staff awareness of the evidence base for computerised approaches could potentially facilitate uptake of the programmes. The consistent disadvantages that were identified in this systematic review, particularly those that contrast with existing evidence (e.g. lack of therapeutic relationship), may therefore represent a potential avenue to increase staff engagement with computerised approaches: Potentially, relevant training could be developed centred

around these disadvantages, with an examination of whether this could facilitate clinicians' use of computerised approaches.

1.5.1: Limitations of existing literature

Whilst conducting this review, it became apparent that there were some limitations in the existing literature on staff attitudes towards cCBT. The first concerns definitions of terms. During our search process, over two-thirds of our exclusions were due to studies examining attitudes towards 'eHealth' applications that were not psychological interventions (e.g. Whitemore et al., 2013), or generic computerised therapies other than cCBT (e.g. Carper et al., 2013).

More worryingly, our search initially identified 24 studies that we believed examined attitudes to cCBT and were suitable for inclusion. Closer examination of the materials (e.g. interview schedules employed or questionnaire wordings) indicated that multiple studies ($n = 5$) examined attitudes to generic eTherapy. In some cases, this was despite the title or key words of the article including computerised or online CBT (e.g. Bengtsson, Nordin & Carlbring, 2015). This is potentially problematic as different intervention models are available in computerised form (e.g. psychodynamic therapy; Zwerenz et al., 2017), and clinicians' own therapeutic orientation has been shown to influence attitudes towards computerised approaches (Vigerland et al., 2014). It is therefore possible that using generic terms could leave studies open to interpretation biases (e.g. sub-samples within the same study considering different therapeutic modalities), which could potentially disguise differences in attitudes. Future studies would benefit from more clarity in regards to definition of key terms (cf. Barak et al., 2009).

Secondly, considerable heterogeneity emerged in terms of the measures used to assess participant attitudes, both relating to the question wording and employed rating scales (e.g. 5-point versus 7-point). This makes comparisons across studies problematic, and occurred despite the existence of standardised instruments assessing clinician attitudes (e.g. the Computer-Assisted Therapy Attitudes Scale; (Becker & Jensen-Doss, 2013)). The heterogeneity of measures, particularly rating scales, was pertinent for our analysis of future use of cCBT, and limits the reliability of our findings. Future studies would therefore benefit from the use of standardised measures to facilitate comparisons across studies.

1.5.2: Limitations and strengths of the review

The results of the current review must be interpreted in light of its strengths and limitations. Firstly, the review consisted of a comparatively low number of studies, which employed heterogeneous methodologies and assessment measures to assess variables. As previously discussed, this limited our availability to conduct comparisons across studies. Despite this, across all three attitudinal domains consistent patterns emerged, which may be reflective of robust findings. Furthermore, systematic reviews often exclude unpublished studies ('grey literature'), which can result in response bias that limits the reliability and validity of subsequent conclusions (Blackhall & Ker, 2007). Although a full search of grey literature was beyond the scope of this article, two doctoral theses (Baror, 2010; Varley, 2011) were included, which represents a relative strength of this review.

An additional consideration concerns the use of our quality assessment measure (Kmet et al., 2004). Relevant guidelines (e.g. CRD, 2009; Hannes, 2011)

recommend the inclusion of quality assessments in systematic reviews in order to critically evaluate the available evidence. Guidelines advise against reliance on summary scores, however (CRD, 2009), due to a potential to simplify comparisons, and lack of reliability estimates. In order to account for this potential limitation (Kmet et al., 2004), we provided a full description of the quality assessment across all criteria (Tables 3-4), and completed inter-rater reliability checks with two independent raters. In addition, this measure utilises the recommended checklist design (CRD, 2009), and we incorporated analysis of reporting quality (Soares et al., 2004) into our evaluation. Although use of summary scores are therefore questionable (CRD, 2009), the potential impact of bias was limited through use of the above counter-measures.

1.6: Conclusions

Overall, the results from the current review suggest that staff perceive cCBT to be an acceptable treatment for anxiety and/or depression, with the majority of service providers reporting intention to use this modality in the future. Although perceptions of advantages and disadvantages of cCBT were somewhat ambivalent (e.g. that it could facilitate access to psychological therapies but was inappropriate for certain populations or groups; Varley, 2011), overall, positive attitudes emerged.

Furthermore, identification of consistent advantages and disadvantages of cCBT by staff has important clinical implications, as these findings could be used to promote use of cCBT in relevant staff groups. Overall, the current review adds to our understanding of this area by synthesizing existing literature, and revealing similarities to existing data on patient attitudes (cf. Kalthenthaler et al., 2008).

Chapter 2: Empirical project

Journal choice: Behaviour Research and Therapy

Title: Predictors of change in psychological well-being following a computerised cognitive behaviour therapy (cCBT) intervention in Scottish Primary Care: The role of social identity and baseline distress.

Abbreviated title for running head: Social identity and cCBT.

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Keywords: cCBT, Beating the Blues, outcome, well-being, satisfaction

2.1: Highlights

- Computerised CBT (cCBT) studies have tended to focus on symptom severity outcomes
- The impact of cCBT interventions on the promotion of wellbeing has been neglected
- Current results revealed baseline distress to be the strongest predictor of outcome
- Number of group identifications also predicted life and mental health satisfaction

2.2: Abstract

Computerised Cognitive Behaviour Therapy (cCBT) has been shown to be efficacious and effective in treating depression. Predictors of successful response to treatment are poorly understood, and have tended to endorse a pathological model of distress (i.e. focus on symptom reduction rather than promotion of well-being). This study expanded on previous research by assessing the joint predictive power of social identification and baseline distress on well-being outcomes from cCBT. The sample consisted of 1354 participants referred to the 'Beating the Blues' programme, recruited from routine care in Scotland. Well-being outcomes comprised self-rated life and mental health satisfaction, plus functioning and well-being measures assessed through subdomains from the CORE-OM. Results indicated a significant and positive impact of the intervention for all dependent variables. Higher number of group identifications and baseline life and mental health satisfaction levels emerged as significant predictors of outcome for life and mental health satisfaction,

respectively, with baseline distress significantly predicting life satisfaction. For well-being and functioning outcomes, only baseline level of distress emerged as significant predictor. A mediation effect emerged between number of group identifications and baseline levels of distress for each of the satisfaction models, whereas for the functioning model baseline distress was found to moderate the impact of social deprivation.

2.3: Introduction

Mental health problems are widespread across Europe (Whiteford et al., 2015). Some of the highest prevalence rates occur for depressive disorders (Wittchen et al., 2011), with approximately one in ten people in the UK being affected by the condition (Bhattarai, Charlton, Rudisill, & Gulliford, 2013). Depression has been portrayed as a chronic illness (e.g. Richards, 2011) that affects both individuals and society. Associated costs of depressive disorders include increased mortality risk (Rethorst et al., 2017), reduced life satisfaction (Adams et al., 2016), and well-being (Waddell & Jacobs-Lawson, 2010), and increased economic burden (Greenberg et al., 2015).

Guidelines from the National Institute of Health and Care Excellence (NICE) recommend the use of psychological therapies (PTs), including cognitive behavioural therapy (CBT; Beck, 1967) in the treatment of depression (NICE, 2009). A large evidence base supports the efficacy and effectiveness of CBT in reducing depressive symptomatology (e.g. Hawley et al., 2017), although, as with wider PTs, CBT has been subjected to criticisms. These include the research focus on symptom reduction

(e.g. Beard et al., 2016) rather than the promotion of well-being (Huppert & So, 2013), and limited patient access to such treatments (e.g. Hengartner, Angst, Ajdacic-Gross, Rössler, & Angst, 2016).

In terms of promoting well-being, definitions of well-being have emphasised its multidimensional nature (e.g. La Placa, McNaught, & Knight, 2013; Ryff, 1989). These include, but are not limited to, life satisfaction (individuals' subjective assessment of their current life situation; Anand & Arora, 2009), social relationships with others, and functioning (for a review, see Ryff & Singer, 2008). Although clearly important, the research emphasis on symptom reduction has resulted in the neglect of more positive aspects of patient functioning (Keyes, 2012), which has contributed to a call for a move away from a pathological or 'disease model' of distress (Kinderman, 2014, p.30).

Similarly, in terms of patient uptake of PTs, recent Governmental strategies have aimed to improve access to PTs (Scottish Government, 2017). Despite this, waiting times within the majority of Scottish health boards remain above relevant targets (i.e. 90% of patients seen within 18 weeks; Information Services Division, 2017), possibly due to the limited supply of trained clinicians and sufficiently accessible services (cf. Layard, 2006) available to deliver therapy. This has led to the argument that traditional psychological models (i.e. therapist-led CBT [tCBT]) require adaption in order to increase patient access to them (e.g. Newton & Sundin, 2016). One potential adaptation that may help to facilitate access is through computerised CBT.

Computerised CBT (cCBT), depression, and well-being

Computerised CBT interventions utilise the internet or computers to deliver manualised therapy, either as standalone treatments or with therapist support (i.e. embedded approaches; see Barak, Klein, & Proudfoot, 2009). These embedded interventions have been shown to require less clinician time than face-to-face approaches (e.g. Titov et al., 2015), which could help to facilitate patient access to PT (Hadjistavropoulos et al., 2016). A growing evidence base has demonstrated the efficacy (e.g. Andersson, Cuijpers, Carlbring, Riper, & Hedman, 2014) and effectiveness (i.e. performance in routine clinical settings) of cCBT in reducing depressive symptomatology (e.g. Cienanni et al., 2017). Importantly, a recent meta-analysis demonstrated no difference in outcome for depressive or anxiety disorders when tCBT and cCBT were compared (Andersson et al., 2014).

Despite the growing empirical support for computerised interventions, a recent study (Gilbody et al., 2015) was highly critical of cCBT. This randomised control trial (RCT) compared outcomes from treatment as usual (TAU) from patients' general practitioners (GPs), to TAU plus a cCBT intervention using two specific cCBT programmes: Beating the Blues (BtBs) or MoodGYM. Outcomes consisted of depressive symptomatology, general psychological distress and physical or health-related quality of life (QoL). Results indicated that, at 4 months post treatment allocation, no significant differences emerged between conditions for any of the dependent variables. The study therefore concluded that cCBT may be efficacious in treating depression, but is not effective in real-world scenarios (Gilbody et al., 2015).

Despite numerous strengths of this study (e.g. recruitment from routine clinical care), a number of methodological limitations mean that its conclusions should be

interpreted with caution. Of particular importance, data from patients receiving additional therapeutic input (beyond TAU or cCBT) was retained in the analysis. Within the TAU group, almost a fifth of participants (19%) had engaged with cCBT programmes. Furthermore, across the three conditions almost a quarter of patients (23%) accessed additional mental health services (e.g. psychological or psychiatric services), with the highest proportion within the TAU group. As access to additional treatments was not controlled for (in contrast to other studies within this area, e.g. Twomey et al., 2014), and a significant proportion of participants in the ‘control’ condition engaged with the intervention under examination. The lack of an effect therefore could be due to confounding effects from additional treatments.

Furthermore, although at 4 months no significant differences were obtained between conditions, at 12 months follow-up, participants in the MoodGYM condition showed lower depressive symptomatology, distress and higher QoL relating to mental health (but not physical health) than those in the TAU condition, with the effect on mental health QoL maintained at 24 months (Gilbody et al., 2015). Participants in the BtBs condition also displayed higher mental health QoL than those in TAU at 12 months, although this effect was not maintained at 24 months. Thus, despite the overlap between additional treatments that were accessed between conditions, this study provides tentative evidence that cCBT may exert an impact on well-being – particularly QoL related to mental health.

To our knowledge, only three additional studies have examined whether cCBT promotes aspects of well-being⁵. Two of these focused on reducing depressive

⁵ *NB.* A reference and citation search of the studies examining the impact of cCBT on well-being identified three additional studies (Berger, Krieger, Sude, Meyer, & Maercker, 2017; Klein et al., 2017; Schneider et al., 2012). The first two studies utilised a computerised intervention that included therapeutic modalities other than CBT (e.g. Schema Therapy), whereas the second was published as a

symptomatology (Hoifodt et al., 2013; Twomey et al., 2014), including general psychological distress. Only one study explicitly focussed on well-being promotion (Powell et al., 2013). Each study employed a randomised control trial (RCT) design, comparing outcomes for participants who used an online CBT programme (MoodGYM) to wait-list controls. Participants from two studies (Hoifodt et al., 2013; Twomey et al., 2014) were recruited from routine care and engaged with embedded approaches, whereas those in Powell and colleagues' study were recruited from the general public and participated in a standalone intervention. Multiple dependent variables related to well-being were assessed across studies, with the impact of cCBT on depressive symptomatology also examined in each trial.

Similar patterns were obtained across all studies, with significant interactions emerging between intervention group and time for global life satisfaction (Hoifodt et al., 2014), generic well-being (Powell et al., 2013), and depressive symptoms (Hoifodt et al., 2013; Powell et al., 2013; Twomey et al., 2014). In all cases, those in the intervention group showed significantly higher well-being and lower depressive ratings post-intervention than the control condition. Findings were maintained at follow-up (e.g. 12 weeks post-intervention; Powell et al., 2013), whereas no difference was obtained at baseline. This suggests that cCBT exerted a beneficial impact on generic well-being and life satisfaction.

In contrast, no effect of cCBT on functioning (Hoifodt et al., 2014), or on health-related quality of life (Hoifodt et al., 2014; Powell et al., 2013) was obtained. This latter finding is interesting, considering more recent research (Gilbody et al., 2015) where MoodGYM exerted a significant impact on mental health related QoL at 12

technical report that we were unable to access. All three studies were therefore excluded from this review.

and 24 months follow-up, but not on physical QoL. These contradictory findings were only obtained from three studies, however, one of which (Gilbody et al., 2015), as outlined above, was limited by methodological concerns. Furthermore, different measures were employed across studies: Whereas the null findings from two studies (Hoifodt et al., 2014; Powell et al., 2013) employed the EuroQual Group 5-dimension questionnaire (2013) to assess health-related QoL, the later study used the Short-Form Survey (SF-36; Ware & Gandek, 1998), meaning comparisons between studies is problematic (Field, 2005).

In terms of the quality of this research, the studies demonstrated a range of methodological strengths. These ranged from blinding of researchers assessing patient outcomes (Twomey et al., 2014; an important consideration in the reduction of bias; Higgins & Green, 2011) to the inclusion and control of potentially confounding covariates (e.g. previous use of CBT; Powell et al., 2013). Each study added a unique contribution to our understanding of the impact of cCBT on participants' well-being, but they were not without their limitations. One factor of particular concern relates to the high attrition rates that were obtained. Drop-out from the cCBT groups ranged from 23% (Gilbody et al., 2015) to 73.5% (Powell et al., 2013) across studies. These attrition rates are similar to those obtained in the wider literature on cCBT (for a review, see Bowyer, 2017) and some tCBT studies (for a review, see Mohr et al., 2010), but mean the generalizability of the results is questionable. Although the existing evidence suggests that cCBT exerts a beneficial impact on patients' well-being, this is limited to those who engaged with the intervention, who may constitute a specific subgroup. The results therefore cannot be generalized to those who did not engage.

Notwithstanding these caveats, in summary the results from the four studies described above (Gilbody et al., 2015; Hoifodt et al., 2014; Powell et al., 2013; Twomey et al., 2013) provide preliminary evidence that cCBT exerts significant effects on key dimensions of participants' well-being, including global life satisfaction (Hoifodt et al., 2014) and generic well-being (Powell et al., 2013). Importantly, these effects emerged in studies using samples recruited from both clinical settings (Twomey et al., 2014) and the general population (Powell et al., 2013), and for both standalone versus embedded approaches. This suggests that the impact of cCBT on well-being may extend across settings and treatment modalities (cf. Klein et al., 2017). As with the wider cCBT literature, however, the generalizability of the above studies may have been limited by their high attrition rates. Such difficulties with cCBT treatment adherence has contributed to the search for predictors of outcome from cCBT (e.g. Alaoui et al., 2015), in order to facilitate identification of those patients who are most likely to benefit from computerised approaches.

Predictors of outcome from cCBT

To date, eight studies have assessed a limited range of predictors of outcome from cCBT for depression⁶, and have tended to focus on predictors relating to two main areas: clinical (e.g. ADM use, number of previous depressive episodes; e.g. Hadjistavropoulos et al., 2016) and demographic factors (e.g. age, socioeconomic status; e.g. Farrer et al., 2014). Results from these studies have often been inconsistent, however, with some contradictory findings. Three studies have

⁶ NB. An additional study (Warmerdam, Van Straten, Twisk, & Cuijpers, 2013) examined predictors of outcome from cCBT and computerised problem-solving therapy. Results were combined across both treatment groups, however, so findings from this study are omitted from the current analysis.

assessed the impact of ADM use, for example; one demonstrated a positive relationship between treatment response and medication use (Cientanni et al., 2017), whereas two found no significant relationship (Donker et al., 2013; Hadjistavropoulos et al., 2016).

Similarly, inconsistent findings have been obtained for gender, age, and education level (e.g. Høifødt, Mittner, & Waterloo, 2015; Spek et al., 2007; for more details, see Appendix 4, Table A4.1). Although failure to obtain significant effects should be interpreted with caution (cf. Field, 2005), the inconsistent findings reported across a relatively small number of studies suggest that further research examining predictors of outcome is warranted. Furthermore, previous research (e.g. Bower, 2013; Cientanni, 2017) points to the importance of two predictors that have been neglected in the research to date: social identification and baseline psychological distress.

Social identification and psychological distress

Social identification has been defined as the degree to which we feel we belong to certain groups (e.g. friendship or family group) and our perceived similarity to other members of our ingroups (Sani, Herrera, Wakefield, Boroch, & Gulyas, 2012).

Research has demonstrated a strong link between well-being and high group identification (for a review, see Jetten, Haslam, Haslam, Dingle, & Jones, 2014), in terms of both the strength of identification with a specific group (e.g. Greenaway, Cruwys, Haslam, & Jetten, 2016), and the number of group identifications that we hold (Cruwys et al., 2013). Indeed, a growing evidence base suggests that higher levels of group identification are predictive of positive response to psychological

interventions for depression, including CBT (Cruwys et al., 2014), and that multiple group identifications have an additive effect (e.g. Sani et al., 2014).

To the best of our knowledge, to date only one study has examined the predictive power of social identification on outcome (generic psychological distress) from cCBT (Cientanni et al., 2017). This study examined a range of predictors (e.g. socioeconomic deprivation, ADM use) of treatment response in a clinical sample using cCBT. In line with expectations, results revealed a significant and positive impact of number of group identifications that patients held on depressive symptomatology. Socioeconomic deprivation also emerged as a significant predictor of outcome, although its impact was mediated by identification. The mediation effect was small to negligible, however, which is likely to relate to the large sample size and therefore power of the study. Of more interest was that social identification was the strongest predictor of outcome (e.g. almost four times larger than the effect of deprivation), adding credence to the argument that social identification warrants further attention in predictors of outcome from cCBT.

Thus, recent research by Cientanni and colleagues (2017) added valuable insight to our understanding of predictors of treatment response from cCBT. As with the wider literature on the impact of PTs on treatment outcome, this study assessed the effect of cCBT in terms of reduction in psychological distress, rather than the promotion of well-being (Huppert & So, 2013). An additional limitation of the study concerns its lack of inclusion of baseline distress as an additional potential predictor of outcome from cCBT. A recent, individual patient data meta-analysis (Bower et al., 2013) assessed the impact of depressive symptom severity on outcome from low-intensity (i.e. self-help) CBT approaches, including bibliotherapy and cCBT. Across

interventions, results revealed a significant and positive relationship between baseline severity and treatment response, although the magnitude of this effect was small.

Interestingly, findings from this meta-analysis (Bower et al., 2013) also revealed a non-significant trend towards a greater impact of initial severity in computerised, as opposed to written, approaches. Two studies from the cCBT predictor literature reinforce this finding (see Appendix 4, Table A4.1), with results indicating that higher levels of baseline severity were significantly associated with treatment response (Hadjistavropoulos et al., 2016; Spek et al., 2007). These findings (e.g. Bower et al., 2013) reinforce the importance of including baseline symptom severity or distress as a predictor of outcome from cCBT. As with the wider cCBT predictor literature, however, contradictory findings have also emerged, with additional studies demonstrating a positive impact of lower baseline symptomatology predicting treatment response (de Graaf et al., 2010; Spek et al., 2008).

The current study

The current study aimed to address a gap in the literature by assessing the impact of a cCBT intervention on aspects of patient's well-being (namely generic well-being, functioning and satisfaction), thereby moving away from the pathological model of distress (Kinderman, 2014) that is prevalent in existing literature. We also expanded on previous research by examining the effect of cCBT on multiple aspects of satisfaction (i.e. life and mental health satisfaction), as the only previous study to examine this dependent variable (Hoifodt et al., 2014) used a uni-dimensional construct of global life satisfaction (Diener, Emmons, Larsen, & Griffin, 1985). This

study aims to further expand on previous research demonstrating a significant relationship between social identification and well-being (Cruwys et al., 2013; Sani, Madhok, Norbury, Dugard, & Wakefield, 2015). Our study therefore adds a unique contribution to the field by being the first to examine the joint predictive power of social identification and baseline distress on outcomes from cCBT. To the best of our knowledge, this is also the first study to explore the impact of cCBT on both global life satisfaction and mental health satisfaction, as previous studies have relied on uni-dimensional constructs of satisfaction (Hoifodt et al., 2014).

Based on earlier findings (Powell et al., 2012), our hypotheses were that completion of a cCBT intervention would have a positive impact on patients' self-rated life and mental health satisfaction, functioning and well-being. In terms of predictors of outcome, our expectation was that social identification with more social groups (cf. Cientanni et al., 2017) and higher levels of baseline distress (cf. Bower et al., 2013; Hadjistavropoulos et al., 2016) would be significantly related to positive treatment response.

2.4: Method

Ethics

Approval for this study was granted by the Caldicott Guardian of each of the respective health boards, and the Department of Clinical and Health Psychology Ethics Research Panel at the University of Edinburgh (see Appendix 5). No incentives were offered for participation in the study.

Participants

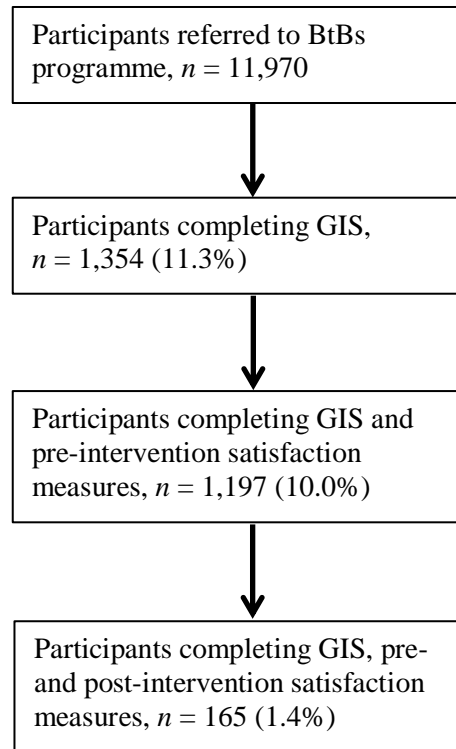
Participants consisted of patients referred to a specific cCBT programme, 'Beating the Blues' (BtBs), by medical or mental health staff. Referral criteria to BtBs and the study included mild-moderate depression (as determined by the referring clinician), no additional comorbid mental health conditions (e.g. psychosis, bipolar disorder) or learning disabilities. In line with previous research (de Graaf et al., 2010), participants with suicidal intention were included in the current analysis, although those who were actively suicidal were excluded from the study.

In total, $n = 11,970$ patient were referred to BtBs over the inclusion period. Of these, 1354 (11.3%) completed and returned the group identity scale (GIS; Sani, Madhok, Norbury, Dugard, & Wakefield, 2014). Due to additional missing data (i.e. non-completion of questionnaire measures), separate samples were therefore used in the conduction of the hierarchical multiple regression (HMR) for the satisfaction and CORE-OM domain analyses (see Figure 2.1). For the two satisfaction measures, the total sample size of the current study was 165 participants, aged 18-79 years ($M = 45.56$, $SD = 14.94$), with 43 male (26.06%) and 96 female participants (58.18%)⁷. For regression analysis with four predictors and an alpha level of .05, post-hoc power analyses using G*power 3 (Faul, Erdfelder, Lang, & Buchner, 2007) indicated that this sample size was sufficient to detect medium-large effect sizes, although small effect sizes would be underpowered. For the CORE-OM domains, the sample size was 281 participants, aged 17-79 years ($M = 44.93$, $SD = 14.94$), with 72 male

⁷ Note. Figures do not add up to 100% as data for some participants was not available: 26 (15.76%) for the satisfaction analyses, and 31 (11.03%) for the CORE-OM analyses.

(25.62%), and 178 female participants (63.35%)². The remaining participants ($n = 31$) did not provide their gender.

Figure 2.1: Flow of completion and attrition rates from group identification and satisfaction measures



Procedure and design

The current study employed a cross-sectional, pre-post design utilising hierarchical multiple regression analyses. Data was collected from four NHS Scotland health boards (Fife, Grampian, Lanarkshire, and Shetland) over a 26-month timespan from September 2014 to November 2016 as part of the Mastermind project (Vis et al., 2015): An international study across nine European countries, investigating barriers and facilitators of implementation of cCBT. Additional data was also collected from routine care within one health board (NHS Tayside) over the

same period. Data collection occurred in two phases. In the first phase, information was gathered by BtBs once participants had registered with the programme. This included basic demographic information (e.g. age, gender) and baseline depressive symptomatology, assessed through the Clinical Outcome in Routine Evaluation Outcome Measure (CORE-OM; Evans et al., 2002). Following completion of the fifth and eighth online module, completion of the CORE-OM measure was repeated.

The second phase of data collection occurred after participants had completed the first online module. The programme coordinator from each healthboard contacted potential participants and sent an electronic invitation to participate in the Mastermind Project, which included a basic description and rationale of the project (see Appendix 6.1). Participants were given the choice to complete either electronic or paper copies of the questionnaires, which assessed additional demographic information (e.g. highest educational qualification, use of anti-depressant medication), the GIS (Sani et al., 2014) and the satisfaction measures (Priebe, Huxley, Knight, & Evans, 1999). Participants who did not respond to the invitation were sent one e-mail reminder. Implied consent was assumed to have been obtained from any participants who returned the completed questionnaires, whereas those who did not respond to the reminder were assumed to have opted-out. Following completion of BtBs' modules, participants were asked to complete the QoL measures for a second time, alongside an additional questionnaire asking them to rate their satisfaction with the programme.

Materials

Intervention

Beating the Blues (BtBs; beatingtheblues.co.uk) is a web-based CBT programme consisting of an introductory video and eight interactive, multimedia modules. It utilises case examples, psycho-education and weekly homework tasks to facilitate patients' understanding of the links between thoughts, feelings and actions. Patients in the current study were able to complete BtBs modules at home, in community locations (e.g. libraries) or clinics.

Group identification

Group identification was assessed using the Group Identification Scale (GIS; Sani et al., 2014). This 4-item measure assesses the degree to which participants have a sense of belonging to each of three groups: their family, community, and a chosen in-group (e.g. workplace group, group of friends, etc). Identification is assessed across two domains: Sense of belonging to the group (e.g. *'I have a sense of belonging to my [group]'*) and sense of shared commonality with other group members (e.g. *'I feel similar to the other members of my [group]'*). Possible responses ranged from 1 (*'I strongly disagree'*) to 7 (*'I strongly agree'*), and average responses for each group were calculated by taking the mean of the four items.

As participants could show high identification with one group (e.g. friendship group) but low identification with another (e.g. community), use of a mean identification score across the three groups was not appropriate (cf. Sani et al., 2014). Binary variables were created by classifying participants who scored equal to or greater than 5 as identifying with the group, and those scoring less than five as not identifying with the group (cf. Sani et al., 2015). To examine the additive impact of multiple high group identifications (cf. Ciantanni et al., 2017; Sani et al., 2014) on

well-being outcomes, participants' total number of group identifications was counted, with possible scores ranging from 0 (participant did not identify with any of the groups) to 3 (participant identified with three groups). Previous research has indicated good levels of reliability ($\alpha = .92$; Sani et al., 2014), for the GIS, regardless of selected group (e.g. family, community).

Socioeconomic deprivation measure

The Scottish Index of Multiple Deprivation (SIMD) is used by the Scottish Government to identify areas of relative socioeconomic deprivation across Scotland (Scottish Government, 2016). It assesses deprivation across seven domains: Housing; crime; access to services; skills and training; education; health; employment and income. The SIMD divides Scotland into 6505 geographical datazones, and calculates deprivation ranks ranging from 1 (most deprived) to 6505 (least deprived). The current study collected participants' postal codes from medical records, and categorised postal codes by SIMD decile rank, ranging from 1 (most deprived) to 10 (least deprived).

ADM use

Participants' ADM use was assessed by a single, self-report item, which asked '*At the moment, do you use antidepressant medication? If so, for how long?*'. Possible responses ranged from '*Yes, for more than 2 months*' to '*No, I don't take them*'. For the current study, responses were dichotomised to create a binary variable ranging from 1 ('*uses ADM medication*') to 2 ('*does not use ADM medication*').

Demographic measures

On referral to BtBs, participants' age, gender and employment status were obtained from medical records. The latter variable was entered as '*employed*', '*unemployed*' or '*unknown*', with data available for $n = 952$ cases of those completing the GIS (70.3%). Educational attainment was assessed by asking participants '*What is the highest level of education you have completed?*', with four possible responses: 1 ('*primary*'); 2 ('*secondary*'); 3 ('*higher/and or university*'); 4 ('*other*').

Psychological distress

Participants' baseline levels of psychological distress were assessed using the Clinical Outcomes in Routine Evaluation Outcome Measure (CORE-OM; Evans, John Mellor-Clark, Frank Mar, 2000). It consists of four domains, namely well-being (e.g. '*I have felt overwhelmed by my problems*'; four items), problem severity (e.g. '*I have felt tense, anxious or nervous*'; 12 items), functioning (e.g. reverse scored: '*I have felt able to cope when things go wrong*'; 12 items), and risk (e.g. '*I have thought of hurting myself*'; six items, although for an alternative factor structure see Lyne, Barrett, Evans, & Barkham, 2006). Possible responses to each of the 34 statements range from 0 ('*not at all*') to 4 ('*most or all of the time*'), with eight positively worded items being reverse scored (e.g. '*I have felt OK about myself*'). Mean item scores were calculated for the scale as a whole and each individual subscale, with higher scores indicating higher levels of distress.

Previous research has indicated acceptable-high psychometric properties for each of the subscales of the CORE-OM (e.g. internal reliability scores ranging from .75 to .94) with the exception of the risk subscale (Evans et al., 2002). This domain

demonstrated questionable test-retest reliability (stability of .64). As additional research has indicated that the risk domain constitutes a separate factor (Lyne et al., 2006) from the remaining 28 items (constituting a generic ‘psychological distress’ factor; Tarescavage & Ben-Porath, 2014), the current study therefore calculated a total-risk mean score for the scale as a measure of baseline psychological distress.

Psychological well-being and functioning

The well-being (four items) and functioning (12 items) subscales from the CORE-OM (Evans et al., 2000) were used to assess participants’ psychological well-being both pre- and post-intervention. Scoring patterns are detailed above, with higher scores indicating lower well-being. The well-being domain is not condition specific, and the functioning subscale assesses both social (e.g. ‘*Talking to people has felt too much for me*’) and general everyday functioning (e.g. ‘*I have achieved the things I wanted to*’). Although the four domain structure of the CORE-OM has been questioned (Lyne et al., 2006), the developers suggest using specific domain scores if these reflect relevant areas of interest (Evans, 2015).

Satisfaction

The Manchester Short Assessment of Quality of Life scale (MANSA; Priebe, Huxley, Knight, & Evans, 1999) is a 25-item measure assessing patients’ QoL, which focuses on satisfaction ratings across specific life domains (e.g. work, friendships). The scale provides a satisfaction mean that has demonstrated acceptable levels of reliability ($\alpha = .73$), high levels of concurrent validity with alternative QoL measures (Priebe et al., 1999), and is suitable for use in adult

populations experiencing mental health difficulties (e.g. Slade, Leese, Cahill, Thornicroft, & Kuipers, 2005). In the current study, participants' life satisfaction (LS) and satisfaction with their mental health (MHS) were assessed by two single items taken from the MANSA. Participants were asked to indicate '*How satisfied are you with your life as a whole today?*' and '*How satisfied are you with your mental health?*', with responses ranging from 1 ('*Couldn't be worse*') to 7 ('*Couldn't be better*').

Preliminary data analysis

The Statistical Package for Social Science (SPSS) software package version 21 (IBM Corp., 2012) was used for all statistical analyses. Data were initially screened for uni- and multi-variate outliers across all predictor and dependent variables, following relevant guidelines (Tabachnick & Fidell, 1996). Responses with *Z*-scores equal to or greater than ± 3.29 (cf. Field, 2005) were classified as univariate outliers, with 17 cases identified (0.06% of cases). Mahanobis distances were employed to check for multivariate outliers (Zijlstra, van der Ark, & Sijtsma, 2010), with no further outliers identified. As no significant differences were obtained including or excluding outliers, results from the full dataset are presented below. Data from participants lost to follow-up were not imputed for the satisfaction measures (cf. Gerhards et al., 2010).

The distribution of each of the variables was subsequently examined. A series of Shapiro-Wilks tests were conducted (cf. Ghasemi & Zahediasl, 2012), which indicated that none of the predictor or dependent variables were normally-distributed (all *p* values < .001). Non-parametric tests (e.g. Spearman's *rho* correlations) were

therefore employed where appropriate during the analysis, and bootstrapping using bias corrected and accelerated (BCa) confidence intervals of 95% was applied to the data prior to conduction of the multiple regression (cf. Fox, 2002). Following relevant statistical guidelines (e.g. Perneger, 1998), correction for Type 1 error was not applied to the multiple regression analyses (cf. Feise, 2002), due to the resultant increased likelihood of obtaining Type II error (Field, 2005). Indeed, Feise (2002) emphasises the importance of considering the size of emerging effects as one alternative to correcting for Type I error. Effect sizes were therefore calculated for each of our analyses. To check for multicollinearity between predictors, a series of Spearman's *rho* correlations were conducted to identify any inter-correlations between variables (see Appendix 7, Table A7.1). As expected, the correlations revealed a number of significant relationships between variables (e.g. positive correlation between SIMD decile and education; $\rho = .13, n = 2191, p < .001$).

To reduce redundancy between variables and account for the correlation between predictors (cf. Cohen, Cohen, West, & Aiken, 2003), we conducted a series of stepwise multiple regression analyses to determine which of five potential covariates (age, gender, education level, employment status, and ADM use) should be selected for inclusion in our final model (J. Cohen et al., 2003). These variables were included due to contradictory findings from previous studies over the role of these factors in predicting outcomes from cCBT (e.g. employment status; Alaoui et al., 2015; Hadjistavropoulos et al., 2016). Following relevant recommendations (Sink & Stroh, 2006), small, medium and large effect sizes were determined by adjusted R^2 values of .01, .06 and .14, respectively.

Four separate analyses were conducted with each satisfaction measure and the CORE functioning (CORE-f) and well-being subscale (CORE-wb) means as the relevant dependent variables. Baseline LS and MHS ratings and/or CORE Total-risk (CORE-tr) scores were entered as the first step in the hierarchical regression⁸, followed by the five potential covariate predictors, with SIMD scores and number of group identifications entered in the final step. For each of the analyses, although the regression models were all significant (all p values $< .001$), explaining between 12.5% to 28.1% of the variance, following correction for Type 1 error ($p < .006$), the only potential predictor to exert an effect was ADM use for the CORE-wb model. None of the remaining predictors exerted a significant effect in any of the remaining analyses (all p values $> .013$; see Appendix 7, Table A7.4). ADM use was therefore retained for the CORE-wb regression model, with all additional covariates excluded from the analysis. Analyses were subsequently conducted on these HMR models to test for violation of assumptions. The majority of requirements were met, with the exception of the linearity of the CORE-wb model (for details see Appendix 7.1).

Data analysis

Descriptive analyses were initially conducted to explore the number of participants commencing each BtBs module and completing the group identity, satisfaction and CORE-OM measures. To explore the relationship between group identification and satisfaction, participants' satisfaction ratings were trichotomized (cf. Gelman, 2015), recoding responses into participants demonstrating low (scores from 1: '*Couldn't be worst*' to 3: '*Mostly dissatisfied*'), neutral (4: '*Mixed*') and high (scores from 5:

⁸ For the analyses with CORE domains as the dependent variables, only the CORE Total-Risk score was entered in step one of the MLR. This was due to the baseline domain scores forming part of the Total-risk score, so entering them as separate variables would not have been appropriate (Field, 2005).

'*Mostly satisfied*' to 7: '*Couldn't be better*') satisfaction ratings. Cross-tabular analyses and Pearson's chi-square were subsequently conducted (Cientanni et al., 2017). To examine whether any differences emerged pre-post intervention on each of the four dependent variables, a series of Wilcoxon signed-rank tests (non-parametric equivalent of repeated measures *t*-tests) were conducted to examine change over time from pre- to post-treatment assessment (critical value set at $p < .013$ for these analyses).

A series of hierarchical multiple regression (HMR) analyses were subsequently conducted to examine predictors of outcome across our satisfaction, well-being and functioning measures. The hypothesised predictor variables selected for inclusion in the HMR were number of high group identifications, socioeconomic deprivation (SIMD measure), baseline measure of psychological distress (CORE-tr), baseline measures of participants' LS and MHS, and ADM use for the CORE-wb model. Finally, moderation analysis was conducted by computing the interaction terms between baseline psychological distress, group identifications and social deprivation. Each interaction term was subsequently entered as an additional predictor in the models.

2.5: Results

Descriptive statistics and cross-tabular analyses

Of the 11,970 participants referred to BtBs, 1354 (32.68) completed the GIS measure (see Figure 2.1). This represents a similar attrition rate from other studies employing cCBT interventions (e.g. Powell et al., 2012). Of these 1354 participants, 492 highly

identified with no groups (36.34%), 415 identified with one group (30.65%), 320 identified with two groups (23.63%), and 127 identified with three groups (9.38%). The full range of SIMD rank deciles (1-10) were represented in the current sample ($M = 5.45$, $SD = 2.76$). In terms of pre-treatment satisfaction, the full range of scores was obtained (1-7), for both LS ($M = 3.59$, $SD = 1.26$) and MHS ($M = 3.09$, $SD = 1.18$). For post-treatment satisfaction, a similar pattern was obtained (range 1-7; $M_{LS} = 4.65$, $SD_{LS} = 1.24$; $M_{MHS} = 4.38$, $SD_{MHS} = 1.18$). For additional demographic statistics, see Appendix 7, Table A7.5.

To assess whether any differences emerged between participants who did ($n = 1354$) and did not complete the GIS ($n = 10,616$) on baseline measures of satisfaction and psychological distress, a series of Mann-Whitney U tests (non-parametric equivalent of independent samples t -tests; Field, 2005) were completed (critical p value $< .017$). For all measures, results indicated that those completing the GIS showed higher baseline levels of satisfaction and lower levels of distress than those not completing the identification scale (all p values $< .005$; see Appendix 7, Table A7.5).

To examine pre- and post-intervention satisfaction ratings as a function of group identification and social deprivation, cross-tabular analyses were conducted, followed by Pearson's chi-square utilising Cramer's V (Field, 2005). Results revealed a significant association pre-intervention between number of high identifications and level of both LS ($\chi^2(6, n = 1197) = 260.89$, $p < .0005$; see Table 2.1) and MHS ($\chi^2(6, n = 1197) = 175.23$, $p < .0005$; see Table 2.2). The same pattern of effects was obtained at post-intervention (both p values $< .005$, one-tailed),

and represented a medium effect size of both analyses (Cramer's $V > 0.3$; Cohen, 1988). The same analyses were conducted for participants' SIMD scores, but

Table 2.1: *Frequencies and percentages for three levels of pre- and post-treatment life satisfaction by number of high group identifications*

No. group identifications	<i>n</i>	Life satisfaction <i>n</i> (%)		
		Low	Neutral	High
Pre-intervention				
0	434	254 (58.53)	150 (34.56)	30 (6.91)
1	365	130 (35.62)	166 (45.48)	69 (18.90)
2	283	54 (19.08)	122 (43.11)	107 (37.81)
3	115	14 (12.17)	30 (26.09)	71 (61.74)
Total:	1197	452 (37.76)	468 (39.10)	277 (23.14)
Post-intervention				
0	51	11 (21.57)	19 (37.25)	21 (41.18)
1	44	3 (6.82)	16 (36.36)	25 (56.82)
2	46	0 (0.00)	7 (15.22)	39 (84.78)
3	24	0 (0.00)	4 (16.67)	20 (83.33)
Total:	165	14 (8.48)	46 (27.88)	105 (63.63)

Note. Bonferroni correction ($p < .006$).

Pre-intervention; $\chi^2(6, n = 1197) = 260.89, p < .001$, Cramer's $V = .33$. Post-intervention; $\chi^2(6, n = 165) = 31.90, p < .001$, Cramer's $V = .31$.

no significant effects emerged (all p values $> .04$). Caution should be used when interpreting the results from the LS analysis, as 33% of the expected counts fell below the minimum acceptable value of five (Field, 2005)⁹. Expected counts for the remaining three models fell within acceptable parameters.

Table 2.2: *Frequencies and percentages for three levels of pre- and post-treatment mental health satisfaction by number of high group identifications*

⁹ We attempted to rectify this problem by performing a median split on the satisfaction ratings. Unfortunately, 33% of the cells remained below the necessary value, so the original methods was retained in order to maximize efficiency (Gelman, 2015).

No. group identifications	<i>n</i>	Mental health satisfaction <i>n</i> (%)		
		Low	Neutral	High
Pre-intervention				
0	435	324 (74.48)	95 (21.84)	16 (3.68)
1	364	210 (57.69)	127 (34.89)	27 (7.42)
2	283	120 (42.40)	122 (43.11)	41 (34.17)
3	115	31 (26.96)	43 (37.39)	41 (35.65)
Total:	1197	685 (57.23)	387 (32.33)	125 (10.44)
Post-intervention				
0	51	13 (25.49)	19 (37.25)	19 (37.25)
1	44	7 (15.91)	18 (40.91)	19 (43.18)
2	46	4 (8.70)	10 (21.74)	32 (69.57)
3	24	3 (12.5)	3 (12.5)	18 (75.00)
Total:	165	27 (16.36)	50 (30.30)	88 (53.33)

Note. Bonferroni correction ($p < .013$).

Pre-intervention; $\chi^2(6, n = 1197) = 175.23, p < .001$, Cramer's $V = .27$. Post-intervention; $\chi^2(6, n = 165) = 18.25, p < .005$, Cramer's $V = .24$.

Treatment effectiveness

Wilcoxon signed-rank tests were conducted to examine changes in participants' satisfaction, functioning and well-being ratings between pre- and post-treatment (see Table 2.3). For each of the four dependent variables, median scores post-treatment significantly exceeded those at pre-treatment (all p values $< .001$). To check for the impact of the intervention on depressive symptomatology (assessed through measure of psychological distress), Wilcoxon signed-rank tests were also completed on participants' pre- and post-intervention CORE-tr scores. This analysis also demonstrated a significant effect (see Table 2.3). To check the reliability of these findings, a bootstrap was applied to the data, followed by paired-samples t -tests. The same pattern of results was obtained for all variables (all p values $< .0001$).

Table 2.3: Medians, ranges, and Wilcoxon signed-rank test results of changes from pre- to post-treatment on life satisfaction, mental health satisfaction, functioning and well-being.

Measures	Pre-treatment		Post-treatment		z (n)	p*	Cohen's r**
	Median	Range	Median	Range			
LS	4.00	6.00	5.00	6.00	-8.05 (165)	.000*	-.63
MHS	3.00	6.00	5.00	6.00	-8.20 (165)	.000*	-.64
CORE-f	1.67	3.75	0.67	3.50	-11.23 (281)	.000*	-.67
CORE-wb	2.25	4.00	1.00	3.75	-12.51 (281)	.000*	-.75
CORE-tr	1.99	3.74	1.07	3.36	-13.21 (281)	.000*	-.79

Note. LS = life satisfaction; MHS = mental health satisfaction; CORE-wb = CORE-OM well-being domain; CORE-f = CORE-OM functioning domain. For satisfaction measures, higher scores = greater satisfaction, whereas for CORE scores higher scores = greater distress. Bonferroni correction ($p < .01$)

* $p < .001$ (two-tailed).

**Cohen's r effect size, small $r = .10$; medium $r = .30$; large $r = .50$ (Cohen, 1988); very large $r = .70$ (Rosenthal, 1996).

Predictors of outcome

A series of HMR analyses were conducted to examine the impact of four hypothesised possible predictors (number of high group identifications, socioeconomic deprivation, baseline psychological distress [CORE-tr score] and baseline LS and MHS) of outcome across our satisfaction, well-being and functioning measures. The additional predictor of ADM use was also entered into the well-being model. Relevant baseline scores and ADM use were entered in step one, followed by SIMD decile in step two and GIS in step three. Change scores were subsequently calculated to determine the impact of each step in the model (i.e. individual predictors). Tolerance statistics were examined to control for multicollinearity, all of which fell within acceptable ranges ($> .10$; Laerd Statistics, 2015).

Satisfaction ratings

In line with expectations, for life satisfaction Model 1 was statistically significant ($F_{(2, 155)} = 21.49, p < .0005$), explaining 20.9% of the variance. Models 2 and 3 were also significant (both p values $< .0005$), but only the addition of GIS (Model 3) led to a statistically significant increase in R^2 of .026 ($F_{(1, 151)} = 5.18, p < .05$), predicting 23.1% of the variance; a large effect (Sink & Stroh, 2006). In terms of individual predictors, baseline level of distress, baseline LS, and GIS all significantly contributed to the model ($p < .05$); see Table 2.4 for regression coefficients and bootstrapped standard errors. In contrast to expectations, social deprivation was not significant (see Table 2.4). Concerning MHS, all three Models were again statistically significant ($F_{(2, 155)} = 10.18, p < .0005$; see Table 2.4), with the addition of GIS (Model 3) resulting in a statistically significant increase in R^2 of .034 ($F_{(1, 151)} = 6.11, p = .015$; see Table 2.4). For Model 3, the collective set of predictors explained 13.3% of the variance (medium-large effect; Sink & Stroh, 2006). Baseline level of distress and group identification emerged as significant predictors (both p values $< .05$), whereas SIMD was not significant (see Table 2.4).

Functioning and well-being

In line with expectations, for CORE-f we obtained a significant effect of Model 1 ($F_{(1, 276)} = 97.78, p < .0005$), with the collective set of predictors explaining 26.0% of the variance; a large effect (Sink & Stroh, 2006; see Table 2.5). Although Models 2

Table 2.4: HMR analyses exploring predictors of outcome in Life Satisfaction and Mental Health Satisfaction with bootstrapped standard errors

Measure	Life satisfaction (LS) (Adj R ² = .23)				Mental health satisfaction (MHS) (Adj R ² = .13)			
	β	<i>B</i>	<i>SE_B</i>	<i>p</i>	β	<i>B</i>	<i>SE_B</i>	<i>p</i>
Baseline CORE-tr	-.138	-.216	.130	.045*	-.195	-.348	.178	.026*
Baseline LS	.257	.223	.081	.003**				
Baseline MHS					.065	.073	.124	.278
SIMD	-.075	-.030	.027	.138	-.061	-.027	.034	.215
Total GIS (0-3)	.196	.205	.090	.012*	.211	.251	.107	.011*

Note. β = standardised coefficient; *B* = unstandardized, bootstrapped coefficient; *SE_B* = Bootstrapped standard error; CORE-tr = CORE-OM total-risk mean; SIMD = Scottish Index of Multiple Deprivations; GIS = Group Identity Scale.

p* < .05 (one-tailed); *p* < .005 (one-tailed).

Table 2.5: HMR analyses exploring predictors of outcome in Functioning and Well-Being domains with bootstrapped standard errors

Measure	CORE-functioning (Adj R ² = .26)				CORE-well-being (Adj R ² = .31)			
	β	<i>B</i>	<i>SE_B</i>	<i>p</i>	β	<i>B</i>	<i>SE_B</i>	<i>p</i>
Baseline CORE-tr	.485	.514	.068	.000**	.518	.627	.083	.000**
ADM use	-	-	-	-	.158	.286	.098	.003*
SIMD	.001	.000	.016	.491	-.088	-.030	.019	.065
Total GIS (0-3)	-.055	-.041	.043	.170	-.085	-.072	.054	.093

Note. β = standardised coefficient; *B* = unstandardized, bootstrapped coefficient; *SE_B* = Bootstrapped standard error; CORE-tr = CORE-OM total-risk mean; ADM-use = anti-depressant medication use; SIMD = Scottish Index of Multiple Deprivations; GIS = Group Identity Scale.

p* < .005 (one-tailed); *p* < .001 (one-tailed)

and 3 were also significant (both p values $p < .0005$), inclusion of the additional predictors did not result in a change in R^2 (e.g. Model 3: $\Delta R^2 = .002$, $F_{(1,273)} = .87$, $p = .351$). From the individual predictors, only baseline severity of distress contributed significantly to the model ($p < .0005$). Regression coefficients and bootstrapped standard errors can be found in Table 2.5. Concerning CORE-wb, all three Models were again statistically significant (e.g. Model 1: $F_{(2, 246)} = 54.64$, $p < .0005$), with the predictors explaining 31.2% of the variance. Inclusion of the additional predictors did not result in a change in R^2 (e.g. Model 2: $\Delta R^2 = .009$, $F_{(1,243)} = 3.05$, $p = .081$). For this model, baseline level of distress and ADM use exerted a significant effect (both values $p < .01$; see Table 2.5).

Moderation analysis

A further series of HMR were conducted to assess whether the interaction between psychological distress and group identification or social deprivation had an impact on our outcome variables. Interaction terms between the predictors were computed by finding the product of each pair of variables (i.e. CORE-tr and GIS, CORE-tr and SIMD, GIS and SIMD; Field, 2005), with the resulting term subsequently entered as an additional predictor in the final step of the models. All models retained their statistical significance (all p values $< .0005$).

A significant moderation effect emerged between baseline distress and social deprivation for the CORE-f domain ($B = -.058$, $SE_B = .021$, $p < .01$, 95% CI $[-.10, -.02]$; see Table 2.6). Adding the interaction into the model resulted in a statistically significant increase in R^2 of .019 ($F_{(2, 272)} = 7.25$, $p < .01$); a small effect (Sink & Stroh, 2006). In terms of individual predictors, CORE-tr exerted a significant effect

on functioning at each step of the Model (see Table 2.6). Following the inclusion of the interaction in Model 3, SIMD emerged as an additional predictor ($p < .005$; see Table 2.6). No further significant moderation effects were obtained (all p values $> .22$; see Appendices A8.1 – A8.6).

Table 2.6: Moderation analyses exploring predictors of outcome in Functioning with bootstrapped standard errors for baseline distress by social deprivation interaction

Measure	CORE-functioning (CORE-f) (Adj R ² = .23)			
	β	B	SE_B	p
	Step 1			
Baseline CORE-tr	.512	.543	.055	.000***
	Step 2			
Baseline CORE-tr	.485	.514	.067	.000***
Total GIs (0-3)	-.055	-.041	.043	.332
SIMD	.001	.000	.015	.980
	Step 3			
Baseline CORE-tr	.784	.831	.137	.000***
Total GIs (0-3)	-.056	-.041	.042	.327
SIMD	.358	.105	.033	.002**
Interaction, SIMD*CORE-tr	-.478	-.058	.021	.007*

Note. CORE-tr = CORE-OM total minus risk mean score; GIS = Group Identification Scale; SIMD = Scottish Index of Multiple Deprivations; β = standardised coefficient; B = unstandardized, bootstrapped coefficient; SE_B = Bootstrapped standard error; CORE-tr = CORE-OM total-risk mean. * $p < .01$ (two-tailed); ** $p < .005$ (two-tailed); *** $p < .001$.

To assess the impact of the moderation on the functioning model, CORE-tr scores were subjected to a 3-way split (cf. Gelman, 2015), based on the mean \pm 1 standard deviation ($M = 2.06$, $SD = .70$; cf. Hayes & Rockwood, 2017). HMR analyses were subsequently performed, with GIS entered in step 1 of the Models and SIMD entered in step 2. None of the Models were significant (all p values $> .09$; see

Appendix A8.7). Examination of individual predictors indicated that SIMD only emerged as a significant predictor of functioning for low CORE-tr scores ($B = .039$, $SE_B = .018$, $p < .05$, 95% CI [.003, .073]). This suggests that level of baseline distress moderated the impact of social deprivation on participants' post-intervention functioning. Bootstrapped analyses indicated a significant positive correlation between SIMD and CORE-f scores for low CORE-tr scores ($B = .003$, $SE_B = .067$, $r = .237$, $p < .001$, 95% CI [.099, .373], one-tailed), indicating that high post-intervention functioning was associated with high levels of deprivation when baseline distress was low. These results should be interpreted with caution, however, as the models did not retain their significance following the 3-way split of the CORE-tr scores.

Mediation analyses

Finally, mediation analyses were performed using Hayes' PROCESS Macro (2013), with baseline distress entered as the independent variable, GIS as the mediating variable, and the satisfaction, CORE-f and CORE-wb measures entered as dependent variables. Separate analyses were conducted for each outcome domain. The models for both LS ($F_{(2, 157)} = 20.74$, $p < .0001$) and MHS ($F_{(2, 157)} = 20.74$, $p < .0001$) were significant, with the predictors explaining 20.9% and 15.6% of the variance, respectively; large effects (Sink & Stroh, 2006). As indicated in Table 2.7, results of the mediation analysis demonstrated a significant mediation effect between GIS, CORE-tr and both satisfaction domains.

As none of the 95% confidence intervals cross zero, the total, direct and indirect effects are all significant (Preacher & Hayes, 2008). As the direct and indirect

Table 2.7: Mediation analyses for Life and Mental Health satisfaction outcomes with bootstrapped standard errors for baseline distress by social deprivation

	Life Satisfaction				Mental Health Satisfaction			
	Beta	SE	95% CI		Beta	SE	95% CI	
			Lower	Upper			Lower	Upper
Total effect	-.583	.116	-.813	-.354	-.610	.135	-.876	-.344
Direct effect	-.364	.126	-.613	-.116	-.414	.149	-.708	-.121
Indirect effect (GIS)	-.219	.065	-.354	-.101	-.196	.076	-.357	-.060

Note. GIS = Group Identification Scale

effects are both significant (see Table 2.7), this suggests that some of the variation in LS and MHS accounted for by baseline distress was underwritten by membership to multiple groups; a partial mediation (see Figures 2.2 - 2.3). No significant mediation effects emerged for the functioning or well-being domains (see Appendix A8.8).

Figure 2.2: Mediation model of baseline distress as a predictor of life satisfaction, mediated by number of group identities

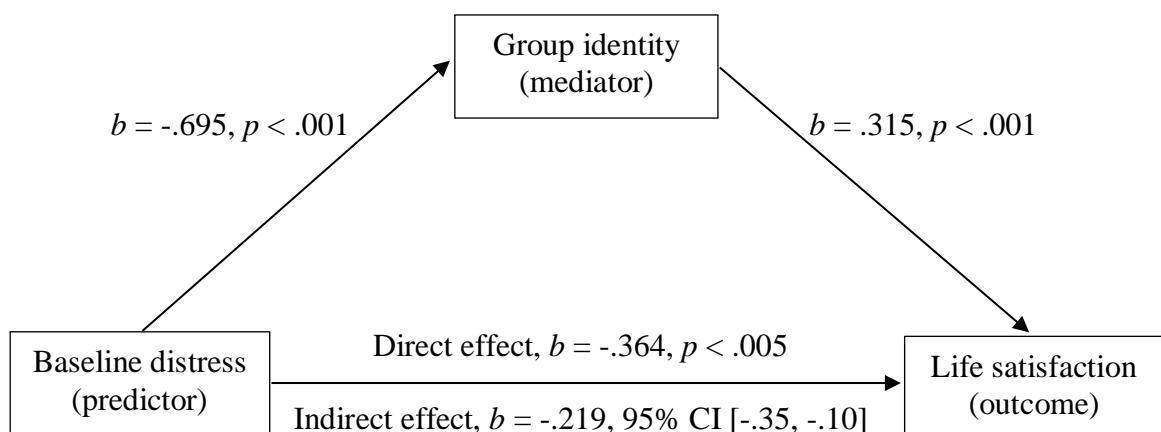
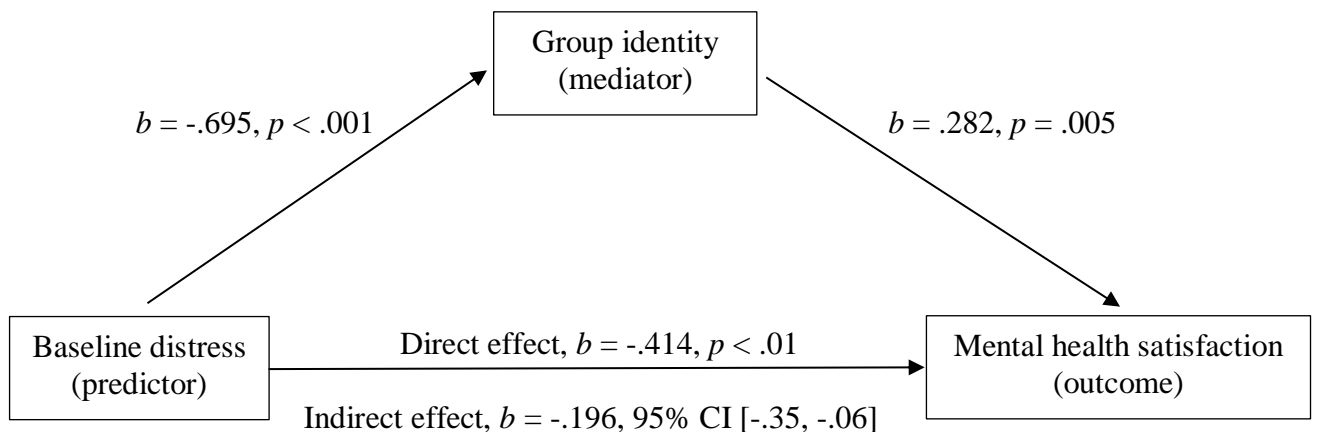


Figure 2.3: Mediation model of baseline distress as a predictor of mental health satisfaction, mediated by number of group identities



2.6: Discussion

The current study demonstrates that a cCBT intervention, Beating the Blues, significantly improved well-being (i.e. life and mental health satisfaction, functioning, and generic well-being) and reduced depressive symptoms (generic psychological distress) in a clinical sample. This adds to the growing literature on the effectiveness, as opposed to efficacy, of cCBT in routine clinical settings (e.g. Andersson et al., 2014), and through its focus on the promotion of well-being moves away from the pathological model of distress (Kinderman, 2014). Our finding that the BtBs intervention exerted an impact on mental health satisfaction, in addition to life satisfaction, adds a unique contribution to the field, as only one previous study has explored the impact of cCBT on satisfaction (Hoifoidt et al., 2013). As this study employed a uni-dimensional construct of global life satisfaction, our study is, to the best of our knowledge, the first to indicate that cCBT exerts a significant and positive impact on mental health satisfaction.

In terms of predictors of outcome from cCBT, preliminary analyses revealed that a range of demographic factors (namely age, gender, education level and employment status) were unrelated to treatment response. These findings are consistent with previous studies (e.g. no impact of employment status on cCBT outcome; Farrer et al., 2014; Spek et al., 2008), yet contrast with others (e.g. employment predicts positive response; de Graaf et al., 2010; Hoifodt et al., 2014). Although our study adds to the evidence base suggesting that these variables do not predict treatment response in cCBT, failure to obtain significant results should be interpreted with caution (Field, 2005) and needs further replication before firm conclusions can be drawn.

Of more interest and in line with our expectations, the current study demonstrated that social identification and baseline psychological distress significantly predicted outcome from BtBs. In line with expectations, identification with more groups exerted a positive impact on treatment response for both satisfaction measures, reinforcing previous evidence revealing a positive relationship between group identification and mental health (Cruwys et al., 2014). Although these results indicate that group identification promotes well-being responses from cCBT interventions, in contrast to expectations, this impact did not extend to the functioning or well-being domains of the CORE-OM (Evans et al., 2002), as identification scores were not predictive of outcome for either of these measures.

This finding was initially surprising, considering the evidence for a positive relationship between identification and well-being (Greenaway et al., 2016). A more detailed consideration of the CORE-OM questionnaire and its four subdomains (i.e. functioning, well-being, problem severity and risk; Evans et al., 2002) suggested that

our findings may have been compromised by our measure: Analyses have indicated that the four individual subscales of the original model show considerable overlap, and should not be used independently (Lyne et al., 2006). Our failure to obtain a significant impact of social identification on wellbeing and functioning is therefore likely to have been compromised by the use of the CORE-OM. Further research in this area utilising alternative conceptualisations of functioning and well-being may therefore be warranted.

In terms of baseline distress, this was the only predictor to exert a significant impact on treatment response across all four models (notwithstanding the operational difficulties of the CORE-OM subdomains, as discussed above). In contrast with our hypothesis, however, lower rather than higher levels of distress were predictive of positive treatment response. Although this finding contrasts with an earlier meta-analysis indicating the opposite pattern (Bower et al., 2013), our results are consistent with some existing studies (de Graaf et al., 2010; Spek et al., 2007), suggesting that further research in this area is warranted.

In line with expectations, our analysis obtained a significant moderation of baseline distress on the impact that SIMD scores exerted on functioning. This finding should be interpreted with caution due to the difficulties outlined above concerning CORE-OM subscales, but is consistent with the mediation effect obtained in Ciantanni and colleagues' (2017) study between social identification, socioeconomic deprivation and treatment outcome. Our analysis demonstrated that deprivation only exerted an impact on participants' self-reported functioning when baseline distress was low. Under these circumstances, lower levels of functioning

were associated with lower levels of deprivation, which reinforces the importance of including baseline distress as a predictor of outcome in future studies.

Finally, in contrast with our expectation, no moderation emerged between baseline distress and group identification for any of our outcome variables. A significant mediation did emerge between group identity and distress on post-intervention life and mental health satisfaction. This suggests that some of the variation in LS and MHS accounted for by baseline distress was underwritten by membership of multiple groups, and adds to previous arguments (Saeri, Cruwys, Barlow, Stronge, & Sibley, 2017) that the role of group identification in mental health warrants further examination. As a positive relationship emerged between group identity and post-intervention satisfaction, this suggests that identification with multiple groups is a protective factor that mediates the impact of baseline distress on satisfaction outcomes. In terms of clinical implications of this finding, as argued by Ciantanni and colleagues (2017), this result supports the inclusion of social prescribing as one potentially effective treatment for depression within primary care (for a review, see Chatterjee, Camic, Lockyer, & Thomson, 2017).

Limitations and further directions

Although our study represents a significant contribution to the field, it should be considered with respect to its limitations, which also suggest directions for future research. Our attrition rates for completion of self-reported questionnaires were high, for example, with just over 10% of the total referrals to BtBs completing our GIS scale. Of these, only 14% completed both pre- and post-intervention satisfaction measures, which is likely to reduce the generalizability of our results, and may be

suggestive of response bias. This suggestion is reinforced by analyses indicating that those who completed the GIS reported significantly higher baseline satisfaction ratings and lower psychological distress than those who did not (see Table A7.5).

Although this is a limitation of the current study, our attrition rates were comparable with other studies of cCBT (e.g. Farrer et al., 2014). Previous research has also indicated that participants with higher levels of depressive symptoms are more likely to dropout from treatment than those with lower rates (Ramos-Grille, Gomà-Freixanet, Valero, Vallès, & Guillamat, 2014). It is therefore unsurprising that those with higher levels of baseline distress were less likely to complete post-intervention assessment measures than those with lower symptom severity. Considering the negative association between baseline distress and satisfaction outcomes, however, further work examining ways of encouraging patients with higher baseline severity to engage with cCBT is warranted (Karyotaki et al., 2015).

A significant limitation of our study concerns additional treatments that patients may have received. Although we controlled for the use of ADM, we did not assess whether participants accessed any additional, psychological or psychiatric input. As suggested by the study by Gilbody and colleagues (2015), this may have confounded our results. Unfortunately, controlling for this variable was not pragmatic considering the scope of the current research (i.e. conduction across five health boards, and multiple recruitment sites). Future research would therefore benefit from inclusion of this variable, where at all possible, so its impact can be explored.

Finally, an additional confounding factor concerns our use of single-item measures to assess LS and MHS, as single-item assessments have been shown to be less reliable and/or valid than multi-item scales (e.g. Diamantopoulos, Sarstedt,

Fuchs, Wilczynski, & Kaiser, 2012). Despite this criticism, however, the inclusion of two separate (i.e. life and mental health) components of satisfaction is a strength of the current study. Furthermore, analyses specifically examining the psychometrics of single-item *satisfaction* measures have indicated high correlations with multi-item scales, and acceptable validity ratings (Cheung & Lucas, 2014), which partially addresses this limitation of the study. Despite this, future research within this area would benefit from the inclusion of longer scales, with due consideration of the impact that this could have on response rates and participant burden (e.g. Galesic & Bosnjak, 2009).

Conclusions

Our current study adds a unique contribution to the examination of predictors of treatment response to cCBT, through its emphasis on promotion of well-being rather than symptom reduction, and the inclusion of GIS and baseline distress as predictors of outcome. As emphasised in previous research (Cientanni et al., 2017; Sani et al., 2015), the significant impact of social identification on the well-being of patients in our current study lends credence to the importance of social prescribing as part of a stepped-care approach to distress. In addition, in a climate of reduced funding and waiting list pressures within the NHS (Information Service Division, 2017), the current study adds existing evidence that cCBT offers an effective, lower-intensity treatment option for patients.

2.7: Acknowledgements

The authors assert that all procedures contributing to this work comply with the ethical standards of the Helsinki Declaration of 1975, and its most recent revision.

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Conflict of interests

The authors have no conflicts of interest with respect to this publication, and received no funding for this project

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Appendices

Appendix 1: Search terms for systematic review

Cognitive behaviour therapy terms

cCB; iCBT; computer* CBT; internet CBT; web* CBT; online CBT; e-therap*;
internet cognit* behavi* therap*; computer cognit* behavi* therap*; web cognit*
behavi* therap*; online cognit* behavi* therap*; e-healt*

Perception terms

Attitu*; percept*; accept*; challeng*; barrier*; experienc*; opinion*; perspectiv*;
decision making*; views*; feasib*; utilit*

Staff terms

Employee*; patient*; clinician*; physician*; therapist*; psychologist*;
psychotherapy; clinical psycholog*; mental health profession*; mental health care
personnel; mental health provider*; health care personnel; service provider*; mental
health worker*; staff*; staff* or employee* adj5 psycholog*; GP; general
practitioner*; nurs*; health profession*; student*.

Mental health terms

Depress*; anxiet*

Appendix 2: Example emails requesting additional information from study authors

Email requesting information regarding age with whom clinicians worked:

Dear Dr,

I hope that you may be able to help me with a question regarding your XX paper, entitled I am currently conducting a systematic review looking at clinicians' attitudes to computerised CBT (cCBT), and therefore read your paper with great interest.

I was hoping to be able to have two separate sections in my review, one looking at studies investigating clinicians' attitudes towards cCBT for adults, and the second looking at attitudes towards cCBT for children and adolescents. I was therefore wondering whether you had a record of whether the participants in your study worked with adults or children?

If you assessed such a variable I would be extremely grateful if you were able to share this information with me.

Yours sincerely,

Email requesting interview schedule, to assess whether study assessed attitudes towards cCBT or generic online therapies:

Dear Dr,

My name is and I am currently conducting a systematic review on studies concerning clinicians' attitudes towards computerised CBT. I therefore read your recent article, entitled with great interest.

One of the difficulties that I have encountered whilst conducting this review is that a number of studies refer to generic online self-help programmes, rather than cCBT specifically. I was therefore hoping that you might be willing to share your semi-structured interview schedule with me, to ensure that I can include your study in the review. This would also enable me to compare the topics addressed by the various studies on this issue.

Yours sincerely,

Appendix 3: Quality assessment checklist (Kmet et al., 2004)

3.1: Manual for Quality Scoring of Quantitative Studies

Definitions and Instructions for Quality Assessment Scoring

How to calculate the summary score

Total sum = (number of “yes” * 2) + (number of “partials” * 1)

Total possible sum = 28 – (number of “N/A” * 2)

Summary score: total sum / total possible sum

Quality assessment

1. Question or objective sufficiently described?

Yes: Is easily identified in the introductory section (or first paragraph of methods section). Specifies (where applicable, depending on study design) all of the following: purpose, subjects/target population, and the specific intervention(s)/association(s)/descriptive parameter(s) under investigation. A study purpose that only becomes apparent after studying other parts of the paper is not considered sufficiently described.

Partial: Vaguely/incompletely reported (e.g. “describe the effect of” or “examine the role of” or “assess opinion on many issues” or “explore the general attitudes”...); or some information has to be gathered from parts of the paper other than the introduction/background/objective section.

No: Question or objective is not reported, or is incomprehensible.

N/A: Should not be checked for this question.

2. Design evident and appropriate to answer study question?

(If the study question is not given, infer from the conclusions).

Yes: Design is easily identified and is appropriate to address the study question/objective.

Partial: Design and /or study question not clearly identified, but gross inappropriateness is not evident; or design is easily identified but only partially addresses the study question.

No: Design used does not answer study question (e.g., a comparison group is required to answer the study question, but none was used); or design cannot be identified.

N/A: Should not be checked for this question.

3. Method of subject selection (and comparison group selection, if applicable) or source of information/input variables (e.g., for decision analysis) is described and appropriate.

Yes: Described and appropriate. Selection strategy designed (i.e., consider sampling frame and strategy) to obtain an unbiased sample of the relevant target population or the entire target population of interest (e.g., consecutive patients for clinical trials, population-based random sample for case-control studies or surveys).

Where applicable, inclusion/exclusion criteria are described and defined (e.g., “cancer” -- ICD code or equivalent should be provided). Studies of volunteers: methods and setting of recruitment reported. Surveys: sampling frame/ strategy clearly described and appropriate.

Partial: Selection methods (and inclusion/exclusion criteria, where applicable)

are not completely described, but no obvious inappropriateness. Or selection strategy is not ideal (i.e., likely introduced bias) but did not likely seriously distort the results (e.g., telephone survey sampled from listed phone numbers only; hospital based case-control study identified all cases admitted during the study period, but recruited controls admitted during the day/evening only). Any study describing participants only as “volunteers” or “healthy volunteers”. Surveys: target population mentioned but sampling strategy unclear.

No: No information provided. Or obviously inappropriate selection procedures (e.g., inappropriate comparison group if intervention in women is compared to intervention in men). Or presence of selection bias which likely seriously distorted the results (e.g., obvious selection on “exposure” in a case-control study).

N/A: Descriptive case series/reports.

4. Subject (and comparison group, if applicable) characteristics or input variables/information (e.g., for decision analyses) sufficiently described?

Yes: Sufficient relevant baseline/demographic information clearly characterizing the participants is provided (or reference to previously published baseline data is provided). Where applicable, reproducible criteria used to describe/categorize the participants are clearly defined (e.g., ever-smokers, depression scores, systolic blood pressure > 140). If “healthy volunteers” are used, age and sex must be reported (at minimum). Decision analyses: baseline estimates for input variables are clearly specified.

Partial: Poorly defined criteria (e.g. “hypertension”, “healthy volunteers”, “smoking”). Or incomplete relevant baseline / demographic information (e.g.,

information on likely confounders not reported). Decision analyses: incomplete reporting of baseline estimates for input variables.

No: No baseline / demographic information provided. Decision analyses: baseline estimates of input variables not given.

N/A: Should not be checked for this question.

5. If random allocation to treatment group was possible, is it described?

Yes: True randomization done - requires a description of the method used (e.g., use of random numbers).

Partial: Randomization mentioned, but method is not (i.e. it may have been possible that randomization was not true).

No: Random allocation not mentioned although it would have been feasible and appropriate (and was possibly done).

N/A: Observational analytic studies. Uncontrolled experimental studies. Surveys. Descriptive case series / reports. Decision analyses.

6. If interventional and blinding of investigators to intervention was possible, is it reported?

Yes: Blinding reported.

Partial: Blinding reported but it is not clear who was blinded.

No: Blinding would have been possible (and was possibly done) but is not reported.

N/A: Observational analytic studies. Uncontrolled experimental studies. Surveys. Descriptive case series / reports. Decision analyses.

7. If interventional and blinding of subjects to intervention was possible, is it reported?

Yes: Blinding reported.

Partial: Blinding reported but it is not clear who was blinded.

No: Blinding would have been possible (and was possibly done) but is not reported.

N/A: Observational studies. Uncontrolled experimental studies. Surveys. Descriptive case series / reports.

8. Outcome and (if applicable) exposure measure(s) well defined and robust to measurement / misclassification bias? Means of assessment reported?

Yes: Defined (or reference to complete definitions is provided) and measured according to reproducible, “objective” criteria (e.g., death, test completion – yes/no, clinical scores). Little or minimal potential for measurement/misclassification errors. Surveys: clear description (or reference to clear description) of questionnaire/interview content and response options.

Decision analyses: sources of uncertainty are defined for all input variables.

Partial: Definition of measures leaves room for subjectivity, or not sure (i.e., not reported in detail, but probably acceptable). Or precise definition(s) are missing, but no evidence or problems in the paper that would lead one to assume major problems. Or instrument/mode of assessment(s) not reported. Or misclassification errors may have occurred, but they did not likely seriously distort the results (e.g., slight difficulty with recall of long-ago events; exposure is measured only at baseline

in a long cohort study). Surveys: description of questionnaire/interview content incomplete; response options unclear. Decision analyses: sources of uncertainty are defined only for some input variables.

No: Measures not defined, or are inconsistent throughout the paper. Or measures employ only ill-defined, subjective assessments, e.g. “anxiety” or “pain.” Or obvious misclassification errors/measurement bias likely seriously distorted the results (e.g., a prospective cohort relies on self-reported outcomes among the “unexposed” but requires clinical assessment of the “exposed”). Surveys: no description of questionnaire/interview content or response options. Decision analyses: sources of uncertainty are not defined for input variables.

N/A: Descriptive case series / reports.

9. Sample size appropriate?

Yes: Seems reasonable with respect to the outcome under study and the study design. When statistically significant results are achieved for major outcomes, appropriate sample size can usually be assumed, unless large standard errors ($SE > 1/2$ effect size) and/or problems with multiple testing are evident. Decision analyses: size of modeled cohort / number of iterations specified and justified.

Partial: Insufficient data to assess sample size (e.g., sample seems “small” and there is no mention of power/sample size/effect size of interest and/or variance estimates aren’t provided). Or some statistically significant results with standard errors $> 1/2$ effect size (i.e. imprecise results). Or some statistically significant results in the absence of variance estimates. Decision analyses: incomplete description or justification of size of modeled cohort / number of iterations.

No: Obviously inadequate (e.g., statistically non-significant results and standard errors $> 1/2$ effect size; or standard deviations $> _$ of effect size; or statistically non-significant results with no variance estimates and obviously inadequate sample size).
Decision analyses: size of modeled cohort / number of iterations not specified.

N/A: Most surveys (except surveys comparing responses between groups or change over time). Descriptive case series / reports.

10. Analysis described and appropriate?

Yes: Analytic methods are described (e.g. “chi square”/ “t-tests”/“Kaplan-Meier with log rank tests”, etc.) and appropriate.

Partial: Analytic methods are not reported and have to be guessed at, but are probably appropriate. Or minor flaws or some tests appropriate, some not (e.g., parametric tests used, but unsure whether appropriate; control group exists but is not used for statistical analysis). Or multiple testing problems not addressed.

No: Analysis methods not described and cannot be determined. Or obviously inappropriate analysis methods (e.g., chi-square tests for continuous data, SE given where normality is highly unlikely, etc.). Or a study with a descriptive goal / objective is over-analyzed.

N/A: Descriptive case series / reports.

11. Some estimate of variance (e.g., confidence intervals, standard errors) is reported for the main results/outcomes (i.e., those directly addressing the study question/objective upon which the conclusions are based)?

Yes: Appropriate variances estimate(s) is/are provided (e.g., range, distribution, confidence intervals, etc.). Decision analyses: sensitivity analysis includes all variables in the model.

Partial: Undefined “+/-“ expressions. Or no specific data given, but insufficient power acknowledged as a problem. Or variance estimates not provided for all main results/ outcomes. Or inappropriate variance estimates (e.g., a study examining change over time provides a variance around the parameter of interest at “time 1” or “time 2”, but does not provide an estimate of the variance around the difference). Decision analyses: sensitivity analysis is limited, including only some variables in the model.

No: No information regarding uncertainty of the estimates. Decision analyses: No sensitivity analysis.

N/A: Descriptive case series / reports. Descriptive surveys collecting information using open-ended questions.

12. Controlled for confounding?

Yes: Randomized study, with comparability of baseline characteristics reported (or non-comparability controlled for in the analysis). Or appropriate control at the design or analysis stage (e.g., matching, subgroup analysis, multivariate models, etc). Decision analyses: dependencies between variables fully accounted for (e.g., joint variables are considered).

Partial: Incomplete control of confounding. Or control of confounding reportedly done but not completely described. Or randomized study without report of comparability of baseline characteristics. Or confounding not considered, but not

likely to have seriously distorted the results. Decision analyses: incomplete consideration of dependencies between variables.

No: Confounding not considered, and may have seriously distorted the results. Decision analyses: dependencies between variables not considered.

N/A: Cross-sectional surveys of a single group (i.e., surveys examining change over time or surveys comparing different groups should address the potential for confounding). Descriptive studies. Studies explicitly stating the analysis is strictly descriptive/exploratory in nature.

13. Results reported in sufficient detail?

Yes: Results include major outcomes and all mentioned secondary outcomes.

Partial: Quantitative results reported only for some outcomes. Or difficult to assess as study question/objective not fully described (and is not made clear in the methods section), but results seem appropriate.

No: Quantitative results are reported for a subsample only, or “n” changes continually across the denominator (e.g., reported proportions do not account for the entire study sample, but are reported only for those with complete data -- i.e., the category of “unknown” is not used where needed). Or results for some major or mentioned secondary outcomes are only qualitatively reported when quantitative reporting would have been possible (e.g., results include vague comments such as “more likely” without quantitative report of actual numbers).

N/A: Should not be checked for this question.

14. Do the results support the conclusions?

Yes: All the conclusions are supported by the data (even if analysis was inappropriate). Conclusions are based on all results relevant to the study question, negative as well as positive ones (e.g., they aren't based on the sole significant finding while ignoring the negative results). Part of the conclusions may expand beyond the results, if made in addition to rather than instead of those strictly supported by data, and if including indicators of their interpretative nature (e.g., "suggesting," "possibly").

Partial: Some of the major conclusions are supported by the data, some are not. Or speculative interpretations are not indicated as such. Or low (or unreported) response rates call into question the validity of generalizing the results to the target population of interest (i.e., the population defined by the sampling frame/strategy).

No: None or a very small minority of the major conclusions are supported by the data. Or negative findings clearly due to low power are reported as definitive evidence against the alternate hypothesis. Or conclusions are missing. Or extremely low response rates invalidate generalizing the results to the target population of interest (i.e., the population defined by the sampling frame/strategy).

N/A: Should not be checked for this question.

3.2: Manual for Quality Scoring of Qualitative Studies

Definitions and Instructions for Quality Assessment Scoring

How to calculate the summary score

Total sum = (number of "yes" * 2) + (number of "partials" * 1)

Total possible sum = 20

Summary score: total sum / total possible sum

Quality assessment

1. Question / objective clearly described?

Yes: Research question or objective is clear by the end of the research process (if not at the outset).

Partial: Research question or objective is vaguely/incompletely reported.

No: Question or objective is not reported, or is incomprehensible.

2. Design evident and appropriate to answer study question?

(If the study question is not clearly identified, infer appropriateness from results/conclusions.)

Yes: Design is easily identified and is appropriate to address the study question.

Partial: Design is not clearly identified, but gross inappropriateness is not evident; or design is easily identified but a different method would have been more appropriate.

No: Design used is not appropriate to the study question (e.g. a causal hypothesis is tested using qualitative methods); or design cannot be identified.

3. Context for the study is clear?

Yes: The context/setting is adequately described, permitting the reader to relate the findings to other settings.

Partial: The context/setting is partially described.

No: The context/setting is not described.

4. Connection to a theoretical framework / wider body of knowledge?

Yes: The theoretical framework/wider body of knowledge informing the study and the methods used is sufficiently described and justified.

Partial: The theoretical framework/wider body of knowledge is not well described or justified; link to the study methods is not clear.

No: Theoretical framework/wider body of knowledge is not discussed.

5. Sampling strategy described, relevant and justified?

Yes: The sampling strategy is clearly described and justified. The sample includes the full range of relevant, possible cases/settings (i.e., more than simple convenience sampling), permitting conceptual (rather than statistical) generalizations.

Partial: The sampling strategy is not completely described, or is not fully justified. Or the sample does not include the full range of relevant, possible cases/settings (i.e., includes a convenience sample only).

No: Sampling strategy is not described.

6. Data collection methods clearly described and systematic?

Yes: The data collection procedures are systematic, and clearly described, permitting an “audit trail” such that the procedures could be replicated.

Partial: Data collection procedures are not clearly described; difficult to determine if systematic or replicable.

No: Data collection procedures are not described.

7. Data analysis clearly described, complete and systematic?

Yes: Systematic analytic methods are clearly described, permitting an “audit trail” such that the procedures could be replicated. The iteration between the data and the explanations for the data (i.e., the theory) is clear – it is apparent how early, simple classifications evolved into more sophisticated coding structures which then evolved into clearly defined concepts/explanations for the data). Sufficient data is provided to allow the reader to judge whether the interpretation offered is adequately supported by the data.

Partial: Analytic methods are not fully described. Or the iterative link between data and theory is not clear.

No: The analytic methods are not described. Or it is not apparent that a link to theory informs the analysis.

8. Use of verification procedure(s) to establish credibility of the study?

Yes: One or more verification procedures were used to help establish credibility/trustworthiness of the study (e.g., prolonged engagement in the field, triangulation, peer review or debriefing, negative case analysis, member checks, external audits/inter-rater reliability, “batch” analysis).

No: Verification procedure(s) not evident.

9. Conclusions supported by the results?

Yes: Sufficient original evidence supports the conclusions. A link to theory informs any claims of generalizability.

Partial: The conclusions are only partly supported by the data. Or claims of

generalizability are not supported.

No: The conclusions are not supported by the data. Or conclusions are absent.

10. Reflexivity of the account?

Yes: The researcher explicitly assessed the likely impact of their own personal characteristics (such as age, sex and professional status) and the methods used on the data obtained.

Partial: Possible sources of influence on the data obtained were mentioned, but the likely impact of the influence or influences was not discussed.

No: There is no evidence of reflexivity in the study report.

Modifications:

8. Use of verification procedure(s) to establish credibility of the study?

Yes: Two or more verification procedures were used to help establish credibility/trustworthiness of the study (e.g., prolonged engagement in the field, triangulation, peer review or debriefing, negative case analysis, member checks, external audits/inter-rater reliability, “batch” analysis).

Partial: One verification procedure used to help establish credibility/trustworthiness of the study

No: Verification procedure(s) not evident.

11. (qualitative) and 15. (quantitative). Write-up

Yes: Provides all required detail to complete quality assessment (e.g. population with whom clinicians worked, power of study).

Partial: Provides most details required to complete quality assessment, but one detail omitted (e.g. population with whom clinicians worked, professional roles of participants), or information provided in wrong section (e.g. method section instead of introduction).

No: Insufficient information provided for quality assessment - further clarification required on multiple points (e.g. population with whom clinicians worked, clinicians' professional groupings, etc).

Appendix 4: Predictors of Outcome from cCBT

Table A4.1: Characteristics and outcomes from studies examining predictors of outcome from cCBT for depression

Authors	Year	<i>n</i>	cCBT programme	Outcome measures	Analysis method	Predictors and moderators	Results: significant predictors and moderators of response
Andersson et al.	2004	71	Name not provided	BDI MADRS	Multiple regression	Baseline depression severity (BDI and MADRS) No. previous episodes of depression Baseline QoL (QOLI) Age Gender Education	BDI Fewer previous episodes of depression* MADRS Higher baseline QoL***
Cientanni et al	2017	976	Beating the Blues	CORE-OM	Multi-nominal logistic regression	Social identification (GIS) Socioeconomic deprivation (SIMD) Problem duration (months to years) ADM use Age Gender Education	Social identification*** Socioeconomic deprivation** ADM use* Age***
de Graaf et al.	2010	303	Colour Your Life	BDI-II	Multiple regression and moderation analysis	Baseline depression severity (BDI-II) Baseline generic pathology (SCL-90) Parental psychiatric history Baseline health-related QoL (SF-36) Treatment adherence (5+ sessions) Employment status	Lower baseline depression severity*** Lower baseline pathology** Parental psychiatric history*
Donker et al.	2013	1843	eCouch and MoodGYM	CES-D	ANOVAs	Baseline depression severity (CES-D) History of depression (dichotomous) Disability (no. days out of role)	Fewer days out of role)***

						Baseline QoL (EUROHIS-QOL)	Higher baseline QoL ^{***}
						Medication use (dichotomous)	
						Age	
						Gender	Female gender*
						Education	
Farrer et al.	2014	155	MoodGYM	CES-D	ANOVAs	Baseline depression severity (CES-D)	
						Motivation (NML-P)	Lower motivation*
						Treatment adherence	
						Age	
						Gender	
						Education	
						Employment status	
Hadjistavropoulos et al.	2016	83	Name not provided	PHQ-9	Multiple regression	Baseline depression severity (PHQ-9)	Higher baseline depressive severity ^c
						Psychotropic medication use	
						Treatment adherence	Treatment adherence (no. of modules started)*
					Latent growth curve modelling	Days accessing	
						No. modules started	
						Contact with therapist	More contact with therapist**
						Comfort with written communication	
						Age	
						Gender	
						Education	
						Employment status	
Hoifodt et al.	2015	106	MoodGYM	BDI-II	Bayesian modelling	Baseline depression severity	
						BDI-II and HADS	
						History of depression	More previous depressive episodes ^b
						Treatment adherence	Higher treatment adherence ^b
						Baseline health-related QoL (EQ-5D)	Lower health-related QoL
						Baseline satisfaction with life (SWLS)	Higher life satisfaction ^b

					Treatment motivation	Lower treatment motivation
					Age	
					Gender	
					Employment status (dichotomised)	
Spek et al.	2007	130	Coping with Depression	BDI-II	ANCOVAs	Higher baseline depression severity***
					Baseline depression severity (HADS)	Higher baseline depression severity***
					History of depression	
					Personality factors (NEO-FFI)	Lower baseline neuroticism**
					Gender	Female gender*
					Education	Higher education level*

Note. BDI = Beck Depression Inventory; MADRS = Montgomery Åsberg Depression Rating Scale; QoL = Quality of life; CORE-OM; Clinical Outcomes in Routine Evaluation Outcome Measure; GIS = Group Identification Scale; SIMD = Scottish Index of Multiple Deprivations; ADM = Anti-Depressant Medication; BDI-II = Beck Depression Inventory, 2nd Edition; SCL-90 = Symptom Checklist 90; SF-36 = 36-item Short-Form Health Survey; CES-D = Center for Epidemiologic Studies Depression Scale; EUROHIS-QOL; EUROHIS Quality of Life Scale (8 items); NLM-P; Nijmegen Motivation List for Prevention; PHQ-9; Patient Health Questionnaire; HADS = Hospital Anxiety and Depression Scale; EQ-5D = EuroQol 5-dimension Self-Report Questionnaire; SWLS = Satisfaction with Life Scale; NEO-FFI = NEO Five Factor Inventory.

* $p < .05$; ** $p < .01$; *** $p < .001$;

^apredictor exerting strongest effect; ^bpredictor likely to be unrelated to treatment response; ^c p value not reported, but significant negative covariance obtained, $r = -.42$

Appendix 5: Ethical and data-sharing approvals



5.1: University approval

The University of Edinburgh
Medical School Doorway 6, Teviot Place Edinburgh EH8 9AG

Telephone 0131 651 3969
Fax 0131 650 3891
Email submitting.ethics@ed.ac.uk

Joanne Persson
Trainee Clinical Psychologist
Department of Clinical and Health Psychology School of Health in Social Science
University of Edinburgh

21 July 2017

Dear Joanne,

Application for Level 1 Ethical Approval

Reference: CLIN396

Project title: Predictors of outcome in computerised Cognitive Behavioural Therapy (cCBT)

Academic Supervisors: Matthias Schwannauer / Ethel Qualye

Thank you for submitting the above research project for review by the Department of Clinical and Health Psychology Ethics Research Panel. I can confirm that the submission has been independently reviewed and was approved on the 7th July 2017.

Should there be any change to the research protocol it is important that you alert us to this as this may necessitate further review.

Yours sincerely,

Kirsty Gardner
Administrative Secretary, Clinical Psychology

5.2: Approval from Mr Christopher Wright, Service Development Manager, NHS 24, to use anonymised data from Mastermind:

Wright,Chris <chris.wright@nhs24.scot.nhs.uk>

Thu 21/09/2017 14:36

Inbox

To: PERSSON, Joanne (NHS TAYSIDE);

You replied on 10/10/2017 12:38.

Hi Joanne,

I confirm that I have given approval for Joanne Persson to use the Mastermind data for the purpose of her PhD research thesis. With the condition no patient identifiable information is used or published.

Chris Wright
Programme Lead cCBT

Chris Wright

Service Development Manager
Scottish Centre for Telehealth & Telecare,
NHS 24, NHS 24 East Contact Centre
Norseman House, 2 Ferrymuir,
South Queensferry, EH30 9QZ

Tel: +44 (0)7825 386324
chris.wright@nhs24.scot.nhs.uk
www.sctt.scot.nhs.uk

Appendix 6: Mastermind questionnaires and information

6.1: Start of Treatment Questionnaire

Please complete the form below which will allow us to better understand any support requirements you may have when completing your treatment. This questionnaire should take no more than 5 minutes to complete. We are interested in your honest answers and *please answer all of the questions* by either typing "X" or writing a cross into the circles below your answer:

When completed please return this to us by email to the following address:
Tay-UHB.beatingtheblues@nhs.net

Or by post to: **Beating the Blues Team, NHS Tayside, Adult Psychological Therapies Service, 7 Dudhope Terrace, Dundee, DD3 6HG.**

1. In general how satisfied are you with your life as a whole?						
Couldn't be worse <input type="radio"/>	Displeased <input type="radio"/>	Mostly dissatisfied <input type="radio"/>	Mixed <input type="radio"/>	Mostly Satisfied <input type="radio"/>	Pleased <input type="radio"/>	Couldn't be better <input type="radio"/>
2. How satisfied are you with your mental health?						
Couldn't be worse <input type="radio"/>	Displeased <input type="radio"/>	Mostly dissatisfied <input type="radio"/>	Mixed <input type="radio"/>	Mostly Satisfied <input type="radio"/>	Pleased <input type="radio"/>	Couldn't be better <input type="radio"/>
3. What is the highest level of education you received and completed?						
Primary <input type="radio"/>	Secondary <input type="radio"/>	Higher/and or University <input type="radio"/>	Other <input type="radio"/>			
4. At the moment, do you use antidepressant medication, if so for how long?						
Yes, for less than one month <input type="radio"/>	Yes, for less than 2 months <input type="radio"/>	Yes, for more than 2 months <input type="radio"/>	I don't take them <input type="radio"/>			
5. I feel a bond with my family.						
I strongly disagree <input type="radio"/>	I disagree <input type="radio"/>	I slightly disagree <input type="radio"/>	I neither agree or disagree <input type="radio"/>	I slightly agree <input type="radio"/>	I agree <input type="radio"/>	I strongly agree <input type="radio"/>

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I feel similar to the other members of my family.						
I strongly disagree <input type="radio"/>	I disagree <input type="radio"/>	I slightly disagree <input type="radio"/>	I neither agree or disagree <input type="radio"/>	I slightly agree <input type="radio"/>	I agree <input type="radio"/>	I strongly agree <input type="radio"/>
7. I have a sense of belonging to my family.						
I strongly disagree <input type="radio"/>	I disagree <input type="radio"/>	I slightly disagree <input type="radio"/>	I neither agree or disagree <input type="radio"/>	I slightly agree <input type="radio"/>	I agree <input type="radio"/>	I strongly agree <input type="radio"/>
8. I have a lot in common with the members of my family.						
I strongly disagree <input type="radio"/>	I disagree <input type="radio"/>	I slightly disagree <input type="radio"/>	I neither agree or disagree <input type="radio"/>	I slightly agree <input type="radio"/>	I agree <input type="radio"/>	I strongly agree <input type="radio"/>
9. I feel a bond with my local community.						
I strongly disagree <input type="radio"/>	I disagree <input type="radio"/>	I slightly disagree <input type="radio"/>	I neither agree or disagree <input type="radio"/>	I slightly agree <input type="radio"/>	I agree <input type="radio"/>	I strongly agree <input type="radio"/>
10. I feel similar to the other members of my local community.						
I strongly disagree <input type="radio"/>	I disagree <input type="radio"/>	I slightly disagree <input type="radio"/>	I neither agree or disagree <input type="radio"/>	I slightly agree <input type="radio"/>	I agree <input type="radio"/>	I strongly agree <input type="radio"/>
11. I have a sense of belonging to my local community.						
I strongly disagree <input type="radio"/>	I disagree <input type="radio"/>	I slightly disagree <input type="radio"/>	I neither agree or disagree <input type="radio"/>	I slightly agree <input type="radio"/>	I agree <input type="radio"/>	I strongly agree <input type="radio"/>

12. I have a lot in common with the members of my local community.						
I strongly disagree <input type="radio"/>	I disagree <input type="radio"/>	I slightly disagree <input type="radio"/>	I neither agree or disagree <input type="radio"/>	I slightly agree <input type="radio"/>	I agree <input type="radio"/>	I strongly agree <input type="radio"/>
13. Please choose a SOCIAL GROUP to which you belong, using the list of groups below.						
Sport team/class/club <input type="radio"/>	Hobby/interest group <input type="radio"/>	Support group <input type="radio"/>	Voluntary/charity group <input type="radio"/>	Workplace group <input type="radio"/>		
Reading/study group <input type="radio"/>	Group of friends <input type="radio"/>	Religious group/institution <input type="radio"/>	Other <input type="radio"/>			
14. I feel a bond with my chosen group.						
I strongly disagree <input type="radio"/>	I disagree <input type="radio"/>	I slightly disagree <input type="radio"/>	I neither agree or disagree <input type="radio"/>	I slightly agree <input type="radio"/>	I agree <input type="radio"/>	I strongly agree <input type="radio"/>
15. I feel similar to the other members of my chosen group.						
I strongly disagree <input type="radio"/>	I disagree <input type="radio"/>	I slightly disagree <input type="radio"/>	I neither agree or disagree <input type="radio"/>	I slightly agree <input type="radio"/>	I agree <input type="radio"/>	I strongly agree <input type="radio"/>
16. I have sense of belonging to my chosen group.						
I strongly disagree <input type="radio"/>	I disagree <input type="radio"/>	I slightly disagree <input type="radio"/>	I neither agree or disagree <input type="radio"/>	I slightly agree <input type="radio"/>	I agree <input type="radio"/>	I strongly agree <input type="radio"/>
17. I have a lot in common with the members of my chosen group.						

I strongly disagree <input type="radio"/>	I disagree <input type="radio"/>	I slightly disagree <input type="radio"/>	I neither agree or disagree <input type="radio"/>	I slightly agree <input type="radio"/>	I agree <input type="radio"/>	I strongly agree <input type="radio"/>
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6.2: Patient – End of Treatment Questionnaire

Please help us improve our treatment by answering some questions about the service you have received this questionnaire should take about 5 minutes to complete. We are interested in your honest opinions, whether they are positive or negative. *Please answer all of the questions.* We also welcome your comments and suggestions. Thank you very much; we really appreciate your help. Please either type "X" or write a cross into the circles below your answer:

18. In general how satisfied are you with your life as a whole?						
Couldn't be worse <input type="radio"/>	Displeased <input type="radio"/>	Mostly dissatisfied <input type="radio"/>	Mixed <input type="radio"/>	Mostly Satisfied <input type="radio"/>	Pleased <input type="radio"/>	Couldn't be better <input type="radio"/>
19. How satisfied are you with your mental health?						
Couldn't be worse <input type="radio"/>	Displeased <input type="radio"/>	Mostly dissatisfied <input type="radio"/>	Mixed <input type="radio"/>	Mostly Satisfied <input type="radio"/>	Pleased <input type="radio"/>	Couldn't be better <input type="radio"/>
20. How would you rate the quality of the treatment you have received?						
Excellent <input type="radio"/>	Good <input type="radio"/>	Fair <input type="radio"/>	Poor <input type="radio"/>			
21. Did you get the kind of treatment you wanted?						
No, definitely <input type="radio"/>	No, not really <input type="radio"/>	Yes, generally <input type="radio"/>	Yes, definitely <input type="radio"/>			
22. To what extent has the treatment met your needs?						
Almost all of my needs have been met <input type="radio"/>	Most of my needs have been met <input type="radio"/>	Only a few of my needs have been met <input type="radio"/>	None of my needs have been met <input type="radio"/>			

23. If a friend were in need of similar help, would you recommend this treatment to him or her?			
No, definitely not <input type="radio"/>	No, I don't think so <input type="radio"/>	Yes, I think so <input type="radio"/>	Yes, definitely <input type="radio"/>

24. How satisfied are you with the amount of help you have received?			
Quite dissatisfied <input type="radio"/>	Indifferent or mildly dissatisfied <input type="radio"/>	Mostly satisfied <input type="radio"/>	Very satisfied <input type="radio"/>

25. Has the treatment you received helped you to deal more effectively with your problems?			
Yes, they helped a great deal <input type="radio"/>	Yes, they helped <input type="radio"/>	No, they really didn't help <input type="radio"/>	No, they seemed to make things worse <input type="radio"/>

26. In an overall general sense, how satisfied are you with the treatment you have received?			
Very satisfied <input type="radio"/>	Mostly satisfied <input type="radio"/>	Indifferent or mildly dissatisfied <input type="radio"/>	Quite dissatisfied <input type="radio"/>

27. If you were to seek help again, would you make use of this treatment again?			
No, definitely not <input type="radio"/>	No, I don't think so <input type="radio"/>	Yes, I think so <input type="radio"/>	Yes, definitely <input type="radio"/>

28. I think that I would like to use and apply the cCBT treatment frequently when needed.				
I strongly disagree <input type="radio"/>	I disagree <input type="radio"/>	I don't disagree nor agree <input type="radio"/>	I agree <input type="radio"/>	I strongly agree <input type="radio"/>

29. I found the cCBT treatment unnecessarily complex.				
I strongly disagree <input type="radio"/>	I disagree <input type="radio"/>	I don't disagree nor agree <input type="radio"/>	I agree <input type="radio"/>	I strongly agree <input type="radio"/>

30. I thought the cCBT treatment was easy to use and apply.				
I strongly disagree <input type="radio"/>	I disagree <input type="radio"/>	I don't disagree nor agree <input type="radio"/>	I agree <input type="radio"/>	I strongly agree <input type="radio"/>

31. I think that I would need the support of a technical person to be able to use and apply the cCBT treatment more often.				
I strongly disagree <input type="radio"/>	I disagree <input type="radio"/>	I don't disagree nor agree <input type="radio"/>	I agree <input type="radio"/>	I strongly agree <input type="radio"/>

32. I found the various functions in the cCBT treatment were well integrated.				
I strongly disagree <input type="radio"/>	I disagree <input type="radio"/>	I don't disagree nor agree <input type="radio"/>	I agree <input type="radio"/>	I strongly agree <input type="radio"/>

33. I thought there was too much inconsistency in the cCBT treatment.				
I strongly disagree <input type="radio"/>	I disagree <input type="radio"/>	I don't disagree nor agree <input type="radio"/>	I agree <input type="radio"/>	I strongly agree <input type="radio"/>

34. I can imagine that most people would learn to use and apply the cCBT treatment very quickly.				
I strongly disagree <input type="radio"/>	I disagree <input type="radio"/>	I don't disagree nor agree <input type="radio"/>	I agree <input type="radio"/>	I strongly agree <input type="radio"/>

35. I found the treatment very cumbersome to use and apply.				
I strongly disagree <input type="radio"/>	I disagree <input type="radio"/>	I don't disagree nor agree <input type="radio"/>	I agree <input type="radio"/>	I strongly agree <input type="radio"/>

36. I felt very confident using and applying the cCBT treatment.				
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I strongly disagree <input type="radio"/>	I disagree <input type="radio"/>	I don't disagree nor agree <input type="radio"/>	I agree <input type="radio"/>	I strongly agree <input type="radio"/>
37. I needed to learn a lot of things before I could get going with the cCBT treatment.				
I strongly disagree <input type="radio"/>	I disagree <input type="radio"/>	I don't disagree nor agree <input type="radio"/>	I agree <input type="radio"/>	I strongly agree <input type="radio"/>
38. If you didn't complete the 8 sessions of treatment, what were the reasons to end the therapy and not finish all sessions as intended?				
<p>I completed all 8 sessions</p> <p>I had problems with my internet connection and/or my computer was not functioning</p> <p>I don't have a computer</p> <p>I don't trust the online sessions are secure</p> <p>I don't have enough skills to follow the online sessions</p> <p>I forgot to attend the online sessions</p> <p>I ran out of time</p> <p>I was ill</p> <p>I had to work</p> <p>My family did not support me</p> <p>I did not want to share my personal information through internet</p> <p>For therapeutic reasons</p> <p>I am not convinced that the therapy solves my problems</p> <p>The referrer and I came to the conclusion it had no use for me to continue treatment</p> <p>My mental problems are alleviated</p> <p>Other</p>				
Comments and Suggestions				

Thank You for taking the time to complete this form.

Please return this to us by email to the following address:

Tay-UHB.beatingtheblues@nhs.net

Or by post to:

Beating the Blues team, NHS Tayside, 7 Dudhope Terrace, DUNDEE, DD3 6HG

Appendix 7: Supplementary analyses

Table A7.1: Spearman correlations between possible predictor variables

Predictors	1	2	3	4	5	6	7	8	9	10	11	12
1. Baseline LS	-											
2. Baseline MHS	.594**	-										
3. Baseline CORE-tr	-.547**	-.547**	-									
4. Baseline CORE-wb	-.503**	-.508**	.855**	-								
5. Baseline CORE-f	-.477**	-.430**	.787**	.656**	-							
6. Total GIS (0-3)	.437**	.363**	-.427**	-.319**	-.403**	-						
7. SIMD	.030	.026	-.096**	-.067**	-.022	.038	-					
8. ADM use	.092*	.128**	-.119**	-.112**	-.136**	.073	-.015	-				
9. Age	.008	.136**	-.157**	-.157**	-.119**	.016	-.022	-.126**	-			
10. Gender	.035	-.017	.019	.100**	-.012	.068	.056**	-.010	-.082**	-		
11. Education	.074	.046	-.088**	-.068*	-.083**	.023	.126**	.002	-.021	.075*	-	
12. Employment	.078*	.068	-.098**	-.079**	-.069**	.056	.034	.055*	-.018	.061**	.045	-

Note. LS = life satisfaction; MHS = mental health satisfaction; CORE-tr = CORE total mean score minus risk; CORE-wb = CORE-OM well-being domain; CORE-f = CORE-OM functioning domain; GIS = group identity scale; SIMD = Scottish index of multiple deprivations; ADM = anti-depressant medication use. Bonferroni correction ($p < .005$).

* $p < .005$ (two-tailed); ** $p < .001$ (two-tailed).

Table A7.2: Spearman correlations between predictor and outcome variables

Predictors	1	2	3	4	5	6	7	8	9	10	11
Total GIS (0-3)	-										
SIMD	.038	-									
Baseline LS	.437**	.030	-								
Baseline MHS	.363**	.026	.594**	-							
Baseline CORE-tr	-.427**	-.096**	-.547**	-.547**	-						
Baseline CORE-wb	-.319**	-.067**	-.503**	-.508**	.855**	-					
Baseline CORE-f	-.403**	-.022	-.477**	-.430**	.787**	.656**	-				
Post-treatment LS	.390**	-.062	.463**	.237**	-.386**	-.342**	-.314**	-			
Post-treatment MHS	.337**	-.098	.340**	.270**	-.341**	-.286**	-.276**	.742**	-		
Post-treatment CORE-wb	-.352**	-.010	-.320**	-.337**	.523**	.496**	.428**	-.548**	-.530**	-	
Post-treatment CORE-f	-.305**	.103*	-.342**	-.345**	.509**	.464**	.751**	-.436**	-.422**	.729**	-

Note. GIS = group identity scale; SIMD = Scottish index of multiple deprivations; LS = life satisfaction; MHS = mental health satisfaction; CORE-tr = CORE total mean score minus risk; CORE-wb = CORE-OM well-being domain; CORE-f = CORE-OM functioning domain; ADM = anti-depressant medication use. Bonferroni correction ($p < .005$).

* $p < .005$ (one-tailed); ** $p < .001$ (one-tailed).

Table A7.3: HMR analyses exploring predictors of change in Life Satisfaction and Mental Health Satisfaction with bootstrapped standard errors

Measure	Life satisfaction (LS) (Adj R ² = .21)				Mental Health satisfaction (MHS) (Adj R ² = .13)			
	β	<i>B</i>	<i>SE_B</i>	<i>p</i>	β	<i>B</i>	<i>SE_B</i>	<i>p</i>
Baseline CORE Total-risk	-.117	-.175	.141	.214	-.159	-.278	.183	.126
Baseline LS	.274	.238	.092	.012*	-	-	-	-
Baseline MHS	-	-	-	-	.154	.176	.135	.191
Age	.013	.001	.006	.863	.031	.003	.007	.725
Gender	-.012	-.028	.213	.894	.017	.047	.258	.858
Education	.007	.011	.116	.927	.012	.021	.160	.896
Employment	.032	.051	.130	.691	-.066	-.121	.161	.461
ADM use	-.095	-.212	.197	.278	.021	.054	.250	.828
Total GIs (0-3)	.191	.197	.104	.062	.202	.243	.127	.055
SIMD	-.176	-.069	.032	.030*	-.122	-.056	.041	.173

Note. β = standardised coefficient; *B* = unstandardized, bootstrapped coefficient; ADM = anti-depressant medication use.

Table A7.4: HMR analyses exploring predictors of change in CORE-OM Functioning and Well-Being domains with bootstrapped standard errors

Measure	CORE Functioning (Adj R ² = .27)				CORE Well-Being (Adj R ² = .28)			
	β	<i>B</i>	<i>SE_B</i>	<i>p</i>	β	<i>B</i>	<i>SE_B</i>	<i>p</i>
Baseline CORE Total-risk	.463	.480	.349	.000*	.477	.575	.092	.000**
Age	-.072	-.004	.075	.257	-.018	-.001	.003	.759
Gender	-.014	-.023	.003	.816	.040	.078	.108	.467
Education	.024	.025	.095	.675	.023	.027	.066	.683
Employment	-.009	-.010	.059	.880	-.026	-.032	.072	.665
ADM use	.051	.080	.064	.415	.147	.267	.107	.013*
Total GIs (0-3)	-.092	-.067	.097	.166	-.077	-.065	.059	.274
SIMD	-.067	-.020	.048	.263	-.129	-.044	.021	.041*

Note. β = standardised coefficient; *B* = unstandardized, bootstrapped coefficient; ADM = anti-depressant medication use.

p* < .05 (two-tailed). *p* < .001

Appendix 7.1: Assumption checks for HMR

For each of our HMR models relating to satisfaction, a series of analyses were completed to assess for violation of assumptions. Linearity was established for both models for the collective model and individual continuous predictors through examination of regression plots and plots of studentized residuals against the predicted values. Independence of residuals was obtained as assessed by a Durbin-Watson statistic of 1.77 for life satisfaction (LS), and 2.06 for mental health satisfaction (MHS; Field, 2005). As the data had already been examined for multicollinearity and uni- and multi-variate outliers (see *Preliminary data analysis*), we progressed to examine our data for leverage and influential points. All data fell within acceptable ranges for leverage values (i.e. $< .02$; Laerd Statistics, 2015) Cook's distances (all < 1.0 ; Field, 2005). Both models met the assumption of normality, as assessed by Q-Q plots.

The same analyses were completed for our CORE-OM (Evans et al., 2002) dependent variables, with the same patterns obtained for all assessments (e.g. Durbin-Watson statistics of 2.04 and 2.06 for CORE-functioning [CORE-f] and CORE-wellbeing [CORE-wb], respectively). The only exception to this was for the CORE-wb domain, which demonstrated non-linearity.

Table A7.5: Participant characteristics at baseline for those did and did not complete the Group Identity Scale (Sani et al., 2014)

Characteristic	GIS completed (<i>n</i> = 1354)		GIS not completed (<i>n</i> = 10,616)	
	<i>M</i> (SD)	<i>n</i> (%)	<i>M</i> (SD)	<i>n</i> (%)
Age	39.87 (14.69)	1354 (100)	36.45 (13.19)	10,616 (100)
Gender		1098 (81.09)		5315 (50.07)
Female		350 (31.88)		1890 (35.56)
Male		748 (68.12)		3425 (64.44)
Highest education:		1160 (85.67)		1090 (10.27)
Primary		35 (3.02)		5 (0.46)
Second		301 (25.95)		436 (40.00)
Higher/University		591 (50.95)		585 (53.67)
Other		233 (20.09)		64 (5.87)
Employment status:		1184 (87.44)		4296 (40.47)
Employed		283 (23.90)		1035 (24.09)
Unemployed		669 (56.50)		2494 (58.05)
Unknown		232 (19.59)		767 (17.85)
ADM use		1103 (81.46)		3032 (28.56)
Yes		669 (60.65)		1322 (43.60)
No		434 (39.35)		710 (23.42)

Table A7.6: Medians, ranges, and Mann-Whitney U test results between participants who did and did not complete the group identity scale on pre-treatment baseline measures

Measure	GIS completed		GIS not completed		<i>U</i> (<i>n</i>)	<i>p</i>	<i>r</i>
	<i>Median</i>	<i>Range</i>	<i>Median</i>	<i>Range</i>			
LS (<i>n</i>)	4.00 (1197)	6.00	3.00 (294)	5.00	143518 (1491)	.000**	-0.13
MHS (<i>n</i>)	3.00 (1197)	6.00	3.00 (292)	5.00	154857 (1489)	.002*	-0.08
CORE-tr (<i>n</i>)	2.00 (1173)	3.74	2.07 (4235)	3.82	2302584 (5408)	.000**	-0.05

Note. LS = life satisfaction; MHS = mental health satisfaction; CORE-tr = CORE-OM total-risk score; GIS = group identification scale. For satisfaction measures, higher scores = greater satisfaction, whereas for CORE scores higher scores = greater distress. Bonferroni correction ($p < .008$).

* $p < .005$ (two-tailed), ** $p < .001$ (two-tailed)

Appendix 8: Moderation and mediation analyses

Table A8.1: Moderation analyses exploring predictors of outcome in Satisfaction domains with bootstrapped standard errors for group identity by baseline distress interaction

Measure	Life satisfaction (LS) (Adj R ² = .23)				Mental health satisfaction (MHS) (Adj R ² = .13)			
	β	<i>B</i>	<i>SE_B</i>	<i>p</i>	β	<i>B</i>	<i>SE_B</i>	<i>p</i>
					Step 1			
Baseline CORE-tr	-.183	-.286	.131	.029*	-.266	-.473	.182	.009**
Baseline LS	.364	.300	.079	.000***				
Baseline MHS					.115	.128	.121	.296
					Step 2			
Baseline CORE-tr	-.138	-.216	.130	.101	-.195	-.348	.177	.052
Baseline LS	.257	.223	.084	.007**				
Baseline MHS					.065	.073	.124	.559
Total GIs (0-3)	.196	.205	.091	.025*	.211	.251	.107	.025*
SIMD	-.075	-.030	.028	.284	-.061	-.027	.034	.433
					Step 3			
Baseline CORE-tr	-.228	-.357	.195	.064	-.285	-.507	.251	.044*
Baseline LS	.256	.222	.084	.007**				
Baseline MHS					.060	.067	.125	.587
Total GIs (0-3)	.008	.008	.180	.964	.029	.034	.234	.878
SIMD	-.078	-.031	.028	.264	-.064	-.029	.034	.404
Interaction, GIS*CORE-tr	.184	.114	.094	.218	.179	.126	.126	.310

Note. CORE-tr = CORE-OM total minus risk mean score; GIS = Group Identification Scale; SIMD = Scottish Index of Multiple Deprivations; β = standardised coefficient; *B* = unstandardized, bootstrapped coefficient; *SE_B* = Bootstrapped standard error; CORE-tr = CORE-OM total-risk mean. **p* < .05 (two-tailed); ***p* < .01 (two-tailed); ****p* < .001 (two-tailed)

Table A8.2: Moderation analyses exploring predictors of outcome in Satisfaction domains with bootstrapped standard errors for group identity by social deprivation interaction

Measure	Life satisfaction (LS) (Adj R ² = .23)				Mental health satisfaction (MHS) (Adj R ² = .15)			
	β	<i>B</i>	<i>SE_B</i>	<i>p</i>	β	<i>B</i>	<i>SE_B</i>	<i>p</i>
					Step 1			
Baseline CORE-tr	-.183	-.286	.130	.030*	-.266	-.473	.181	.008**
Baseline LS	.346	.300	.070	.000****				
Baseline MHS					.115	.128	.120	.288
					Step 2			
Baseline CORE-tr	-.138	-.216	.129	.094	-.195	-.348	.177	.049*
Baseline LS	.257	.223	.084	.008**				
Baseline MHS					.065	.073	.123	.571
Total GIs (0-3)	.196	.205	.087	.022*	.211	.251	.106	.022*
SIMD	-.075	-.030	.027	.277	-.061	-.027	.034	.421
					Step 3			
Baseline CORE-tr	-.138	-.216	.126	.089	-.200	-.356	.173	.039*
Baseline LS	.243	.211	.085	.013*				
Baseline MHS					.034	.038	.125	.760
Total GIs (0-3)	.361	.379	.177	.032*	.529	.630	.221	.004***
SIMD	.015	.006	.049	.908	.113	.051	.055	.351
Interaction, GIS*SIMD	-.193	-.028	.026	.283	-.377	-.061	.033	.064

Note. CORE-tr = CORE-OM total minus risk mean score; GIS = Group Identification Scale; SIMD = Scottish Index of Multiple Deprivations; β = standardised coefficient; *B* = unstandardized, bootstrapped coefficient; *SE_B* = Bootstrapped standard error; CORE-tr = CORE-OM total-risk mean. **p* < .05 (two-tailed); ***p* < .01 (two-tailed); ****p* < .005; *****p* < .001 (two-tailed)

Table A8.3: Moderation analyses exploring predictors of outcome in Satisfaction domains with bootstrapped standard errors for social deprivation by baseline distress interaction

Measure	Life satisfaction (LS) (Adj R ² = .23)				Mental health satisfaction (MHS) (Adj R ² = .13)				
	β	<i>B</i>	<i>SE_B</i>	<i>p</i>	β	<i>B</i>	<i>SE_B</i>	<i>p</i>	
					Step 1				
Baseline CORE-tr	-.183	-.286	.127	.025*	-.266	-.473	.179	.009**	
Baseline LS	.346	.300	.077	.000***					
Baseline MHS					.115	.128	.119	.280	
					Step 2				
Baseline CORE-tr	-.138	-.216	.130	.101	-.195	-.348	.177	.052	
Baseline LS	.257	.223	.084	.007**					
Baseline MHS					.065	.073	.124	.559	
Total GIs (0-3)	.196	.205	.091	.025*	.211	.251	.107	.025*	
SIMD	-.075	-.030	.028	.284	-.061	-.027	.034	.433	
					Step 3				
Baseline CORE-tr	-.100	-.157	.280	.569	-.138	-.245	-.376	.509	
Baseline LS	.257	.223	.083	.007**					
Baseline MHS					.068	.075	.122	.534	
Total GIs (0-3)	.195	.205	.090	.023*	.210	.250	.107	.020*	
SIMD	-.030	-.012	.076	.868	.008	.003	.101	.971	
Interaction, SIMD*CORE-tr	-.063	-.010	.046	.821	-.095	-.018	-.057	.763	

Note. CORE-tr = CORE-OM total minus risk mean score; GIS = Group Identification Scale; SIMD = Scottish Index of Multiple Deprivations; β = standardised coefficient; *B* = unstandardized, bootstrapped coefficient; *SE_B* = Bootstrapped standard error; CORE-tr = CORE-OM total-risk mean. **p* < .05 (two-tailed); ***p* < .01 (two-tailed); ****p* < .001 (two-tailed)

Table A8.4: Moderation analyses exploring predictors of outcome in Functioning and Well-being domains with bootstrapped standard errors for group identity by baseline distress interaction

Measure	CORE-functioning (CORE-f) (Adj R ² = .26)				CORE well-being (CORE-wb) (Adj R ² = .31)				
	β	<i>B</i>	<i>SE_B</i>	<i>p</i>	β	<i>B</i>	<i>SE_B</i>	<i>p</i>	
					Step 1				
Baseline CORE-tr	.512	.543	.055	.000**		.534	.646	.069	.000**
					Step 2				
Baseline CORE-tr	.485	.514	.066	.000**		.518	.627	.082	.000**
ADM use						.158	.286	.099	.006*
Total GIs (0-3)	-.055	-.041	.042	.343		-.085	-.072	.054	.185
SIMD	.001	.000	.015	.979		-.088	-.030	.020	.134
					Step 3				
Baseline CORE-tr	.480	.509	.087	.000**		.511	.619	.102	.000**
ADM use						.158	.286	.099	.006*
Total GIs (0-3)	-.067	-.049	.084	.560		-.099	-.085	.093	.367
SIMD	.001	.000	.015	.985		-.088	-.030	.020	.136
Interaction, GIS*CORE-tr	.011	.005	.052	.929		.014	.007	.065	.910

Note. CORE-tr = CORE-OM total minus risk mean score; GIS = Group Identification Scale; SIMD = Scottish Index of Multiple Deprivations; ADM use = anti-depressant medication use; β = standardised coefficient; *B* = unstandardized, bootstrapped coefficient; *SE_B* = Bootstrapped standard error; CORE-tr = CORE-OM total-risk mean.

p* < .01 (two-tailed); *p* < .005 (two-tailed)

Table A8.5: Moderation analyses exploring predictors of outcome in Functioning and Well-being domains with bootstrapped standard errors for group identity by social deprivation interaction

Measure	CORE-functioning (CORE-f) (Adj R ² = .26)				CORE well-being (CORE-wb) (Adj R ² = .31)			
	β	<i>B</i>	<i>SE_B</i>	<i>p</i>	β	<i>B</i>	<i>SE_B</i>	<i>p</i>
Baseline CORE-tr	.512	.543	.055	.000*	Step 1			
					.534	.646	.069	.000*
Baseline CORE-tr	.485	.514	.067	.000*	Step 2			
ADM use					.518	.627	.082	.000*
Total GIs (0-3)	-.055	-.041	.043	.334	.158	.286	.100	.004*
SIMD	.001	.000	.016	.978	-.085	-.072	.053	.175
					-.088	-.030	.020	.135
Baseline CORE-tr	.483	.512	.069	.000*	Step 3			
ADM use					.514	.622	.082	.000*
Total GIs (0-3)	-.095	-.069	.102	.490	.161	.291	.100	.004*
SIMD	-.017	-.005	.024	.833	-.160	-.136	.121	.262
Interaction, GIS*SIMD	.047	.005	.014	.729	-.124	-.042	.027	.118
					.089	.010	.018	.565

Note. CORE-tr = CORE-OM total minus risk mean score; GIS = Group Identification Scale; SIMD = Scottish Index of Multiple Deprivations; ADM use = anti-depressant medication use; β = standardised coefficient; *B* = unstandardized, bootstrapped coefficient; *SE_B* = Bootstrapped standard error; CORE-tr = CORE-OM total-risk mean.

**p* < .005 (two-tailed)

Table A8.6: Moderation analyses exploring predictors of outcome in Well-being with bootstrapped standard errors for social deprivation by baseline distress interaction

Measure	CORE-functioning (CORE-f) (Adj R ² = .23)			
	β	<i>B</i>	<i>SE_B</i>	<i>p</i>
			Step 1	
Baseline CORE-tr	.534	.646	.070	.000**
			Step 2	
Baseline CORE-tr	.518	.627	.082	.000**
ADM use	.158	.286	.100	.005*
Total GIs (0-3)	-.085	-.072	.053	.175
SIMD	-.088	-.030	.019	.124
			Step 3	
Baseline CORE-tr	.743	.899	.154	.000**
ADM use	.176	.317	.100	.002*
Total GIs (0-3)	-.088	-.075	.054	.165
SIMD	.173	.058	.043	.169
Interaction, SIMD*CORE-tr	-.355	-.049	.026	.060

Note. CORE-tr = CORE-OM total minus risk mean score; GIS = Group Identification Scale; SIMD = Scottish Index of Multiple Deprivations; β = standardised coefficient; *B* = unstandardized, bootstrapped coefficient; *SE_B* = Bootstrapped standard error; CORE-tr = CORE-OM total-risk mean.

p* ≤ .005 (two-tailed); *p* < .001 (two-tailed).

Table A8.7: HMR analyses exploring predictors of outcome in Functioning with bootstrapped standard errors for low, middle and high levels of baseline distress

CORE-tr level	Predictor	CORE-functioning (CORE-f)			
		β	B	SE_B	p
Low		Step 1			
(Adj R ² = .033)	Total GIS (0-3)	-.085	-.039	.055	.475
		Step 2			
	Total GIS (0-3)	-.090	-.041	.054	.444
	SIMD	.224	.039	.018	.029*
Middle		Step 1			
(Adj R ² = .028)	Total GIS (0-3)	-.148	-.098	.061	.117
		Step 2			
	Total GIS (0-3)	-.145	-.096	.060	.117
	SIMD	.162	.041	.026	.112
High		Step 1			
(Adj R ² = .018)	Total GIS (0-3)	-.085	-.081	.102	.418
		Step 2			
	Total GIS (0-3)	-.067	-.064	.104	.535
	SIMD	-.179	-.056	-.001	.084

Note. GIS = Group Identification Scale; SIMD = Scottish Index of Multiple Deprivations; β = standardised coefficient; B = unstandardized, bootstrapped coefficient; SE_B = Bootstrapped standard error; CORE-tr = CORE-OM total-risk mean.

* $p < .05$ (two-tailed).

Table A8.8: Mediation analyses for Functioning and Well-being domains with bootstrapped standard errors

	Functioning				Well-being			
	Beta	SE	95% CI		Beta	SE	95% CI	
			Lower	Upper			Lower	Upper
Total effect	.552	.055	.445	.660	.651	.062	.530	.773
Direct effect	.521	.063	.398	.645	.611	.071	.471	.750
Indirect effect (GIS)	.031	.031	-.029	.093	.041	.035	-.026	.110

Note. GIS = Group Identification Scale

Appendix 9: Empirical protocol

Research objectives and questions

The current research has two primary and one secondary objectives. The primary objectives are: 1) to explore the relationship between group identification and social deprivation on the magnitude of change in patients' well-being (defined as QoL or life satisfaction and functioning) and 2) To explore the interaction between patients' group identification, well-being scores and level of depressive symptomatology following participation in the BtBs intervention.

Our secondary objective is to explore the impact of seven predictor variables (baseline symptom severity, ADM use, adherence to BtBs, age, gender, education and employment status) on the magnitude of change in patients' well-being following participation in a BtBs intervention.

The hypotheses for this study are:

1. Higher levels of group identification will predict increased participant well-being following the BtBs intervention.
2. Lower levels of socioeconomic deprivation will predict increased well-being following the BtBs intervention.

Due to the lack of existing research in relation to the impact of psychological therapies on QoL and well-being (Kolovos et al., 2016), and the role of group identification and socioeconomic deprivation, we also posed the following research question:

3. Is there an interaction between group identification, socioeconomic deprivation, well-being and depressive symptomatology pre- and post-intervention?

Similarly, due to the contradictory evidence in relation to additional predictors of outcome from cCBT (e.g. baseline severity of depression, adherence to cCBT intervention), our final research question was:

4. What is the relationship between individual differences (age, gender, baseline severity of depression scores, educational attainment, current employment

status, ADM use, and adherence to BtBs programme) and magnitude of change in well-being and depressive symptomatology following participation in the BtBs intervention?

Intended data analysis

Option 1: Hierarchical multiple regression (HMR).

Dependent variables:

- Satisfaction (QoL) measures: ratings from 1 (couldn't be worse) to 7 (couldn't be better) of:
 - Satisfaction with life, and satisfaction with mental health.
- CORE-OM (Evans, John Mellor-Clark, Frank Mar, 2000):
 - Well-being and Functioning subscales.

Step 1: Baseline symptom severity (pre-intervention CORE-OM subscale score and QoL)

Step 2, additional predictors:

- age
- gender
- education level
- current employment status.
- Anti-depressant medication use (ADM).

Step 3, Main predictor variables:

- Group Identity Scale (GIS; Sani et al., 2015) and SIMD scores.

Power analyses

For HMR with nine predictor variables, to achieve power of 0.8 (cf. Cohen & Cohen, 1983) for large ($R^2 = .14$), medium ($R^2 = .06$) and small effect sizes ($R^2 = .01$) would require sample sizes of $n = 121$, 270, and 1574, respectively.

Option 2: Moderation

Include the CORE-OM total summary score as an additional dependent variable (measuring psychological distress), and examine the interactions between this, the

well-being dependent variables and GIS (hypothesis: those with higher group identification show increased well-being and reduced distress following the intervention than those with lower group identification).

Procedure

A cross-sectional, pre-post design utilising multiple regression analyses will be employed in the current study. Outcome will be assessed through examining change in patients' level of Quality of Life (QoL) pre- to post-intervention, and changes in participants' functioning and well-being scores pre- to post-intervention. These latter domains will be assessed through relevant subscales from the Clinical Outcomes in Routine Evaluation Outcome Measure (CORE-OM; Evans et al., 2002). QoL will be assessed using two items (e.g. 'How satisfied are you with your life as a whole today?') taken from the Manchester Short Assessment of Quality of Life scale (MANSA; Priebe, Huxley, Knight, & Evans, 1999). Responses range from 1 (*Couldn't be worse*) to 7 (*Couldn't be better*). Change in scores over time will be calculated by assessing whether patients achieve clinically significant change (i.e. whether outcome measure scores fall two or more standard deviations below the pre-treatment mean; Jacobson and Truax, 1991), and by assessing the Reliable Change Index (RCI; Jacobson, Follette & Ravenstorf, 1984). Both predictor and outcome variables will be assessed through self-report questionnaires that constitute routinely collected data within routine clinical practice.

This project will be conducted using previously collected data from a larger study, the Mastermind project (an international study across nine European countries and 14 treatment sites) investigating potential facilitators and barriers to the implementation of cCBT. All participants who are offered and accept a referral to a specific cCBT programme, Beating the Blues (BtBs; recommended for treatment of depression by NICE guidelines, 2009) are invited to participate in the study following their completion of the first online BtBs module. Recruitment occurs in four health boards across Scotland (NHS Lanarkshire, Fife, Grampian and Shetland). In addition, data also collected within NHS Tayside as part of routine care will also be included in the current study. Data collected in NHS Tayside employed the same

methodology as the Mastermind Project. Our study will therefore consist of a secondary analysis of the cCBT data that has already been collected within routine care, as a part of a service evaluation. Caldicott approval for the use of this data has been obtained from each of the participating health boards. Although this data includes identifiable information, such data will not be passed to the current research team: we will only have access to anonymised data, for which all identifying information (e.g. patient Chi numbers, postcodes) has been removed.

Data collection for the Mastermind Project occurred in two phases. In the first phase, information was gathered through the BtBs programme. This included basic demographic information (e.g. age, gender) and baseline depressive symptomatology, assessed through the Clinical Outcome in Routine Evaluation Outcome Measure (CORE-OM; Evans et al., 2002). Following completion of the fifth and eighth online module, completion of the CORE-OM measure was repeated. The second phase of data collection occurred after participants had completed the first online module. The programme coordinator from each healthboard contacted potential participants and sent an electronic invitation to participate in the Mastermind Project. This included a basic description and rationale of the project, and provided the opportunity to ask questions. Participants were given the choice to complete either electronic or paper copies of the questionnaires, which assessed additional demographic information (e.g. highest educational qualification, use of anti-depressant medication), an additional predictor of interest in the study (the Group Identity Scale; GIS, Sani et al., 2014) and self-rated Quality of Life (QoL).

Participants who did not respond to the invitation were sent one e-mail reminder. Implied consent was assumed to have been obtained from any participants who returned the completed questionnaires, whereas those who did not respond to the reminder were assumed to have opted-out. BtBs programme coordinators therefore conducted all participant recruitment, with the research team having no direct contact with potential participants. Following completion of BtBs' modules, participants were sent a second copy of the same questionnaires, plus an additional questionnaire asking them to indicate their satisfaction with the programme and likelihood to use it

again. All administered questionnaire are used within routine care within the five healthboards.

Inclusion criteria were that participants were aged 18 years or over with mild, moderate, or severe depression. In line with previous research (e.g. de Graaf et al., 2010; Kessler et al., 2009), participants with suicidal intention would be included in the current analysis. This is in order to recruit a sample that is representative of patients presenting for care. Patients with high levels of suicidality would be monitored closely, however, with the referring agent responsible for supervising their progress. In line with routine practice, exclusion criteria included participants presenting with additional comorbid mental health conditions (e.g. psychosis, bipolar disorder) or a learning disability. Similarly, participants who received additional psychological treatment (e.g. face-to-face therapy) during the course of the study were also excluded.

Appendix 10: Journal guidelines

10.1: BEHAVIOURAL AND COGNITIVE PSYCHOTHERAPY

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Behavioural and Cognitive Psychotherapy is an international multidisciplinary journal for the publication of original research, of an experimental or clinical nature, that contributes to the theory, practice and evaluation of behaviour therapy. As such, the scope of the journal is very broad and articles relevant to most areas of human behaviour and human experience, which would be of interest to members of the helping and teaching professions, will be considered for publication. As an applied science, the concepts, methodology and techniques of behavioural psychotherapy continue to change. The journal seeks both to reflect and to influence those changes. While the emphasis is placed on empirical research, articles concerned with important theoretical and methodological issues as well as evaluative reviews of the behavioural literature are also published. In addition, given the emphasis of behaviour therapy on the experimental investigation of the single case, the journal from time to time publishes case studies using single case experimental designs. For the majority of designs this should include a baseline period with repeated measures; in all instances the nature of the quantitative data and the intervention must be clearly specified. Other types of case report can be submitted for the Brief Clinical Reports section.

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- Reports of original research employing experimental or correlational methods and using within or between subject designs.
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PREPARING YOUR MANUSCRIPT.

Articles must be under 5,000 words at the point of submission, excluding references, tables and figures (except for Brief Clinical Reports, please see separate instructions). Manuscripts describing more than one study may exceed this limit but

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Ethical statements

Where research involves human and/or animal experimentation, the following statements should be included (as applicable): “The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, and its most recent revision.” and “The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional guides on the care and use of laboratory animals.” All manuscripts should also indicate the nature of the ethical governance body, for example by providing ethics committee/audit committee approval reference numbers.

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10.2: BEHAVIOUR RESEARCH AND THERAPY

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BEHAVIOUR RESEARCH AND THERAPY

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