The Impact of Ethnicity on The Trajectory of Depression Symptom Change During Psychological Interventions

Celeste WanYee Teo

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Thesis declaration form

I confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Signature:

Name: Celeste WanYee Teo

Date: 16/07/21

Overview

Part One is a meta-analytic investigating the durability of culturally adapted psychological therapies for Black, Asian and Minority Ethnic (BAME) and non-Western populations. The rationale for examining culturally adapted psychological and durability treatment gains is described, highlighting neglected areas in current literature. A newly developed Conceptual Typology was used as a guiding framework to examine the effectiveness of different adaptation types and their association with sustained treatment effects at follow-up. Findings highlight a scarcity of research that had a longer-term follow-up of six or more months. The chapter further discussed challenges in the evaluation of culturally adapted therapies.

Part Two describes the purpose of examining ethnic variation in depressive symptoms change during psychological therapies. Most of the existing research focuses on ethnic differences in depression treatment outcomes and discusses potential reasons for ethnic disparities in treatment. Findings indicated that individuals from Asian ethnic groups were more likely to be following depression trajectories with high symptom severity than White and Black ethnicities after controlling for sociodemographic and baseline clinical severity symptoms.

Part Three is a critical appraisal providing some reflections about the research project. It considers the methodological issues and clinical implications of research findings.

Impact Statement

Black, Asian and Minority Ethnic (BAME) communities continue to face inequalities in accessing mental health services and treatment outcomes. Considerable efforts have gone into understanding ethnic disparities in mental health outcomes; however, effective strategies to reduce ethnic disparities are yet to be established. The present study extended existing research by examining the effectiveness of culturally adapted therapies and trajectories of depression for BAME clients during psychological therapy.

Part One of the thesis examines the durability of culturally adapted psychotherapy interventions for BAME and non-Western populations. The call for psychological therapies to be adapted stemmed from the notion that evidence-based therapies are developed based on the Western socio-political understanding of mental health difficulties, which may not generalise to individuals who hold different explanatory models of mental health difficulties. Results obtained suggest some evidence of durability, but there is a paucity of studies that examine the longer-term follow-up effects of the culturally adapted intervention. Having a more extended follow-up with multiple time points will allow researchers to examine treatment effectiveness across time and better understand relapse. In-depth investigation of adaptation types offers new insights that could guide future evaluations and develop more effective therapies. Uptake of this typology might enable service providers to consider which adaptations to make in clinical practice. This review is being written up for peer-review publication.

Part Two of the thesis examines the association between ethnicity and trajectories of depression symptom change during psychological therapy. The growth mixture modelling methods and the automated 3-step approach provided a foundation

for future studies to replicate the findings and draw reliable conclusions about ethnic differences in treatment responses. The results also illustrated nuanced differences between ethnic groups and trajectories of symptoms change, highlighting the limitations of examining ethnicity in binary terms (e.g., White versus BAME population). Findings are also in the process of being written up for peer-review publication.

This research also uncovered the impact of incomplete ethnicity data and how current categorisations constrain the conclusions that can be drawn. Ethnicity data completeness is an essential yet often neglected aspect of studies that used data from a naturalistic cohort of patients. It is impossible to investigate ethnic differences in care provision or develop strategies to tackle inequalities without reliable and complete ethnicity data.

Part Three of the thesis discusses applying a behaviour change model to understand barriers and facilitators that may assist clinicians in initiating conversations about culture and ethnicity. This chapter suggests that therapists could modify their approach when engaging with BAME populations, especially at the initial stage of treatment and when patients are at risk of inadequate treatment response. These conversations would enable the therapists to evaluate treatment strategies and incorporate clients' feedback into treatment, improving treatment outcomes. It is hoped that the behaviour change approach is helpful for service providers to understand the social contextual factors that influence behaviours and develop change strategies within the organisation.

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Part 1: Literature Review

Enduring Effects of Culturally Adapted Therapies: Meta-analysis of Follow-Up Studies

Abstract

Background: Culturally adapting psychotherapeutic interventions may reduce ethnic disparities in mental health treatment outcomes by ensuring therapy is compatible with non-Western populations' cultural and illness beliefs. Yet, there is insufficient evidence surrounding the longer-term effectiveness of culturally adapted interventions.

Aims: This study assessed: (1) the longer-term treatment effects of culturally adapted psychological interventions experienced by ethnic minorities and non-Western populations; and (2) the association between different cultural adaptation types and treatment effects at follow-up.

Methods: Electronic literature databases were searched to identify randomised control trials (RCTs) published from inception to December 2020. Types and frequencies of adaptation were coded according to the conceptual typology developed by Arundel et al. (2021).

Results: 17 RCTs provided follow-up data in addition to post-intervention endpoint scores (N= 1903). A moderate effect favouring culturally adapted interventions over control groups was found at post-intervention (g = -0.58 [95% CI: -0.82 -0.35], p <.001), and at follow-up (g = -0.54 [95% CI: -0.78 -0.30], p <.001). The effects persisted up to 3-months post-intervention however, few studies included longer follow-up lengths; hence longer-term effects were unclear. The durability of treatment effects was particularly evident in studies that made language adaptations and content adaptations.

Conclusions: Variability in adaptation type made it challenging to determine which cultural adaptation elements were consistently associated with sustained treatment effects. Future research is needed to establish longer-term benefits of culturally adapted interventions with more follow-up time points.

Introduction

There are marked disparities in accessing mental health services and treatment outcomes between Black, Asian and Minority Ethnic (BAME) and White communities in Western countries (Halvorsrud et al., 2018). BAME populations are less likely to access mental health services, more likely to drop out prematurely, experience poorer treatment outcomes and have more negative experiences with service providers than White populations (Cooper et a., 2013; Interian et al., 2013; Miranda et al., 2020).

Ethnic disparities in treatment engagement can arise due to a myriad of therapist-related (e.g., lack of competence in working with patients from BAME backgrounds) and patient-related factors (e.g., cultural mistrust and expectations of therapy). In high-income countries such as the United States and the United Kingdom (U.K.), BAME populations report a sense of cultural mistrust towards therapists due to lived experiences of being racially discriminated against (Keating & Robertson, 2004). Cultural mistrust refers to an overall mistrust of White-dominated institutions such as the jurisdiction system, health care services and government agencies (David, 2018) that might replicate experiences of being oppressed and discriminated against (Memon et al., 2021). For instance, Muslim immigrants reported a sense of fear towards non-Muslim or American treatment providers, believing that their therapists lacked sufficient understanding of their religious and cultural beliefs to provide the care they needed (Amri & Bemak., 2007).

Literature has also suggested that language barriers, social stigma associated with treatment (Memon et al., 2021) and cultural differences in illness beliefs lead to the underutilisation of psychological services by BAME individuals (Vahdaninia et al., 2021). Additionally, treatment engagement was associated with therapists' ability to broach conversations about BAME patients' racialised experiences and cultural and

religious differences (Cooper et al., 2012; King & Summer, 2020). BAME patients who had conversations about culture with their therapists reported higher satisfaction in the care they received and were more consistent with attendance than patients who did not discuss culture in their therapy sessions (Zhang & Burkard, 2008). However, White clinicians have expressed hesitation about discussing culture with BAME patients, citing difficulties in gauging the relevance of discussing cultures in treatment (King & Summer, 2020). As a result, BAME patients may experience therapists as disinterested in their culturally held beliefs (Yasmin-Qureshi & Ledwith, 2020), which ultimately influence treatment engagement and outcomes (Vahdaninia et al., 2020).

BAME individuals may not have equitable access to care, as shown by a U.K. nationally representative study (Morris et al., 2020) demonstrating that ethnic minority patients with schizophrenia (except those of mixed ethnicity) were less likely to be provided NICE-recommended CBT (NICE, 2009) than White patients. In addition, Black patients were less likely to be offered family therapy than their White counterparts and were more likely to receive antipsychotic medications. Morris and colleagues (2020) proposed that these discrepancies could be attributed by service providers beliefs that BAME populations were less suitable for CBT and family therapy than White populations. Further reports showed that Black individuals were four times more likely to be detained under the mental health treatment act and be forcibly treated than their White counterparts (Keating, 2009; NHS Digital, 2019).

To reduce ethnic disparities in mental health treatment outcomes, researchers (e.g., Alegria et al., 2014; Bernal et al., 2009) have advocated for evidence-based therapy (EBTs) to be contextualised for BAME and non-Western populations. Examples of EBTs for depression include Interpersonal psychotherapy (IPT), Cognitive Behaviour Therapy (CBT), and Behavioural Activation (BA; Cuijpers et al.,

2013, NICE, 2009) while Eye Movement Desensitization Reprocessing therapy, Narrative Exposure Therapy, and Trauma-Focused- CBT are recommended for Post-Traumatic Stress Disorder (PTSD; NICE, 2009). The call for EBTs to be adapted has stemmed from the notion that ethnic minorities are underrepresented in EBT trials that were developed and conducted in Western countries with largely White participants (Alegria et al., 2014). Furthermore, EBTs developed in the West are underpinned by Western socio-political and cultural understandings of mental health difficulties (Marsella, 2009), affecting the generalisability of interventions to other ethnic groups or individuals in a non-Western context. According to the contextual model (Bedi, 2018), the effectiveness of EBTs relies on the extent to which a country's culture is consistent with Western culture; non-Western populations who do not benefit from unadapted therapies may find EBTs to be culturally incongruent. Therefore, adapting EBTs to fit the target population could increase the acceptability of psychological therapies, treatment engagement, and interventions' effectiveness.

Culturally Adapted Therapies

Culturally adapted therapies are distinct from culturally sensitive therapies: culturally sensitive intervention is an individualisation of treatment between a client and a therapist on a case-by-case basis, whereas culturally adapted intervention involves systematically modifying existing treatment protocols to make them relevant to a target population's cultural beliefs, values, and context (Bernal et al., 2009). Therapies can be culturally sensitive by including practices tailored for the target population (Beck, 2016); for instance, therapists can provide translated information leaflets or deliver therapy in the client's native language via an interpreter. In contrast, the process of culturally adapting EBTs involves consulting stakeholders from the target population to incorporate cultural values, socio-environmental contexts, and

illness beliefs into the treatment protocol. Therefore, cultural adaptation is more standardised and in-depth process of modifying therapy than culturally sensitive intervention.

There are several reasons to consider culturally adapting interventions. Firstly, culture affects how people describe and understand their mental health symptoms (Kirmayer, 2012; Hinton et al., 2005). As an illustration of this, a study conducted by Hinton et al. (2005) addressed cultural differences in illness beliefs by incorporating the concept of Khyâl flow (i.e., wind-like substance circulating in the body) into Culturally Adapted-CBT (CA-CBT) when treating Cambodian refugees with PTSD. This approach incorporated culturally appropriate explanations of PTSD symptoms making the treatment rationale more appropriate to patients' beliefs. The results suggested that culturally adapted interventions significantly reduced the severity of PTSD and culturally relevant physiological symptoms (i.e., "neck-focused" panic attacks). Secondly, a direct translation of treatment protocols alone is inadequate in making an intervention effective as some concepts may not be translatable to fit the culturally held beliefs of the target population (Kalibatseva & 2014).

Previous Reviews

Griner and Smith (2006) conducted the first meta-analysis of culturally adapted interventions based on 76 studies. They found a moderate effect from pre-to post-intervention, demonstrating the beneficial effects of culturally adapted interventions in comparison to unadapted or waitlist controls. Treatment delivered in clients' native language was more effective than interventions conducted in English. However, one of the limitations of the Grinder and Smith (2006) study was the inclusion of non-EBTs and studies that used single intervention groups without any comparators (i.e., pre-to post-test design), limiting the conclusions that could be drawn. Nonetheless,

recent meta-analytic evidence has demonstrated the advantages of culturally adapted interventions in alleviating mental health symptoms among BAME and non-Western populations (Arundell et al., 2021; Benish et al.,2011; Bhui et al., 2015; Chowdhary et al., 2014; Kalibatseva & Leong., 2014; van Loon et al., 2013). The effectiveness of cultural adaptation varied from moderate (Hall et al., 2016) to large (Chowdhary et al., 2016). Differences in effect sizes were attributed to variability in participants' characteristics (e.g., ethnicity, mental health condition), intervention designs (e.g., treatment delivered in groups or individual format), the number of modifications made, and the populations studied (e.g., including adolescents and adults; Degnan et al., 2018). Additionally, published reviews included various research designs ranging from randomised controlled trials (RCTs) to observational or quasi-experimental designs (e.g., Griner & Smith, 2006). This variability may partially explain observed discrepancies in effect sizes and inconsistent moderator effects.

Additionally, the types of adaptation associated with better treatment outcomes are inconsistent, possibly due to the different frameworks used to classify and evaluate culturally adapted intervention trials. For instance, ethnic matching, where therapists are selected to match patients' ethnicity, was found to be associated with greater symptom reduction (Bernish et al., 2011; Griner & Smith, 2006), but other meta-analytic reviews did not support this finding (e.g., Hall et al., 2016). Examples of models used to inform and classify features of adaptation include frameworks proposed by Bernal and Saez-Sanriago (2006) and Grinder and Smith (2006). Although each model has different conceptualisations of adaptations, they exhibit considerable consensus. These frameworks emphasise providing therapies in clients' preferred language and incorporating cultural values into treatment content while adhering to the core components of EBTs.

Few reviews utilised Bernal and Sáez-Santiago's framework to examine frequently used adaptation types (Chwdhary et al., 2014; Griner & Smith, 2006) and only Shehadehet al. (2016) to the author's knowledge, examined the association between types of adaptation and effectiveness of treatment. They illustrated that larger treatment effects were observed for studies with a higher number of implemented adaptation elements. However, Bernal and Saez-Sanriago's (2006) framework was critiqued as being too abstract (e.g., Castro et al.,2010) and having overlapping domains (Heim & Kohrt, 2019).

Conceptual Typology

This lack of clarity in classifying elements of adaptations impedes evaluation of which adaptation types are associated with specific treatment effects. Understanding the types of adaptation made by researchers can help improve future therapies for BAME and non-Western populations. More recently, a conceptual typology (see Arundell et al., 2021) was developed to guide the classification and analysis of literature on culturally adapted therapies. This typology is distinguishable from earlier frameworks due to its inclusion of therapist-related, content-related, and organisational factors in culturally adapted interventions. In particular, the typology examine how modifications to service design and delivery are associated with treatment outcomes, which could provide helpful information for mental healthcare providers.

Within the typology, there are common and specific factors associated with the effectiveness of interventions. The common factors are present across all types of psychological intervention (Wampold, 2015), such as modifications that strengthen the therapeutic relationship, collaboratively establish treatment goals (Drisko, 2004)

and ensuring treatment content is acceptable for patients (Bernish et al., 2011). This typology further differentiates specific adaptations into treatment-specific (therapist-related and content-related) and organisation-specific adaptations. Therapist-related specific adaptations are observable features of the treatment provider, such as ethnicity and bilingual therapists or interpreters. Content-related specific adaptations involve translating treatment materials and incorporating culturally relevant beliefs or metaphors. Lastly, organisation-specific adaptations encompass adjustments made to service delivery. This includes changing the location (e.g., providing intervention at community centres), treatment format (e.g., remote or group therapy), time of the day that therapy is delivered, or length of intervention (e.g., adding culturally relevant psychoeducational sessions to treatment protocol).

Using this typology, Arundell et al. (2021) found a moderate effect size for culturally adapted interventions than active controls. Forty-seven culturally adapted RCTs (out of 51) conducted with adults made content-related adaptations, while 32 studies made therapist-related and organisation-related adaptations. Studies that made organisation-specific adaptations were more effective than those that did not, indicating that organisational factors could be pivotal in improving treatment outcomes by increasing the accessibility of treatment. The findings also highlighted a novel approach to investigate cultural adaptations and demonstrated the complexity associated with cultural adaptations such that multiple adaptations were needed to tailor EBTs for the target populations.

Durability of Culturally Adapted Treatments

Despite existing studies demonstrating the effectiveness of culturally adapted therapies, there is a paucity of evidence for the longer-term effects of these interventions. Treatment durability refers to the continual improvement of treatment

benefits at the individual level after the withdrawal or completion of psychological therapy (Holton et al., 2006). EBTs such as CBT is associated with a low risk of relapse, and treatment effects are typically sustained at 1-year follow-up for adults experiencing anxiety and depression (Clarke et al., 2015; Cuiypers et al., 2013; Holton et al., 2006). Similarly, Clarke et al. (2015) found that at 12-month follow-up, CBT, mindfulness-based cognitive therapy (MBCT) and interpersonal psychotherapy (IPT) were associated with a low risk of relapse and treatment effects were maintained. Enduring effects were observed for CBT at 24-month follow-up but not for IPT; no data were available for MBCT. In another study (Cuijpers et al., 2013), CBT was found to reduce the risk of relapse to the same extent as a continuation of antidepressant medications. The sustained effect may prevent symptom recurrence among patients who have recovered (Dobson et al., 2008).

However, ethnic minorities were either underrepresented or underreported in the abovementioned studies. For example, only eight (from 57) studies included in Stewart and Chambless (2009) meta-analysis had at least 20% ethnic minorities. The remaining studies were exclusively conducted with Caucasian participants. These findings limit the generalisability of treatment effects to non-White populations. Nonetheless, some studies suggest culturally unadapted EBTs were effective for African Americans and benefits were sustained at 12-month follow-up (Green et al., 2006; Miranda et al., 2003). For instance, a Cochrane review (Purgato et al., 2018) found that the effectiveness of EBTs significantly decreased over time for people residing in countries such as the Middle East, North Africa, and Asia. Relative to controls, treatment effects for PTSD and depression were attenuated at 1 to 4 months follow-up and diminished at 6-months follow-up. However, it is unknown if culturally

adapting therapy could lead to more sustained treatment effects than unadapted EBTs, as the authors did not report any cultural modifications.

To the author's knowledge, only two meta-analytic reviews (Rojas-Garcia et al., 2015; Ng & Wong., 2018) have investigated the follow-up effects for culturally adapted EBTs. Ng and Wong (2018) reviewed 55 studies involving 6763 Chinese adult participants from China and Hong Kong. There were 24 CA-CBT and 31 unadapted CBT studies. Relative to all control groups, the results found short-term (i.e., assessment at post-intervention or follow-up at less than three months) benefits of CA-CBT for anxiety, depression, and psychosis. Moderator analyses showed a significant difference between culturally adapted and unadapted CBT: a moderate effect was found for CA-CBT while unadapted CBT had a small effect size, suggesting that adapted interventions were more effective than unadapted ones. However, only one CA-CBT study had a follow-up of more than 3-months, preventing long-term comparisons between adapted and unadapted therapies for Chinese individuals.

Rojas-Garcia and colleagues (2015) reviewed the follow-up effects of culturally adapted interventions for socially disadvantaged BAME patients with depression in America. They found that participants who received culturally adapted interventions had significantly lower depressive symptoms than waitlist controls at less than 3-months follow-up. However, the treatment effect attenuated at more than 3-months of follow-up. It is unclear whether treatment benefits of psychological therapy alone were maintained at follow-up as different treatment types (e.g., a combination of pharmacological and psychological therapy and preventative intervention) were included in the review.

Overall, there is insufficient evidence to draw robust conclusions about the enduring benefits of culturally adapted EBTs. None of the studies mentioned above

discussed whether the lack of sustained treatment effects for adapted interventions was due to intervention-related processes (e.g., loss of skills, suboptimal amount of treatment provided), context-related factors (e.g., continued adversities faced in the community) or patient characteristics (e.g., type of populations studied, the complexity of symptoms). Knowing this might inform the development of adapted interventions, potentially focusing on relapse prevention components.

There is a possibility that some participants did not reach complete remission (i.e., symptomatic but no longer meet diagnostic criteria) when treatment ended. Failure to achieve complete remission is one of the strongest predictors of relapse for a mental health condition (Buckman et al., 2018). Similarly, Ali et al. (2017) found that one in two patients who were not in complete remission when CBT ended experienced a clinically significant deterioration within 12 months of treatment completion. People who experience recurrences of mental health conditions are more likely to have complex physical and mental health needs (Gauthier et al., 2019). Given that relapses may occur after treatment ends, insights into the durability of treatments can inform whether adapted interventions are effective in helping BAME and non-Western communities to cope with ongoing stressors.

Purpose of Current Review

The primary aim of this review was to investigate whether culturally adapted EBTs demonstrated a sustained post-treatment effect. A series of subgroup analyses were performed to investigate whether intervention characteristics such as control groups, treatment format, quality of studies, and length of follow-up were associated with effect size. Due to variability in the classification of adaptation types, it was challenging to determine which cultural adaptation elements were consistently associated with sustained treatment effects. Therefore, the secondary aim was to

examine which components of culturally adapted therapies were frequently modified and associated with sustained treatment effects.

Methods

This review extended the procedures used for a previous review that investigated the effectiveness of adapted psychological EBTs at end-of-treatment (Arundell et al., 2021). The same search strategies and inclusion criteria were used to identify relevant studies except for the additional requirement of having follow-up time points (see below). This review followed the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines (Moher et al., 2009).

Search Strategy and Selection of Studies

The following electronic databases were searched for eligible studies published since inception to 10/12/2020: MEDLINE, Embase, PsycINFO, HMIC (via Ovid), ASSIA (via ProQuest), Cochrane Central Register of Controlled Trials (CENTRAL), CDSR (via Wiley) and CINAHL. The search strategy was modified accordingly for each electronic database (see Appendix A). All studies were screened at the title and abstract level according to the pre-determined inclusion and exclusion criteria. The current review only included randomised controlled trials (RCTs) and pilot RCTs published in peer-reviewed journals to ensure methodological rigour (Klein et al., 2007). Eligible RCTs were included based on the following criteria:

- Participants aged 18 and above.
- Participants who identified as belonging to Black, Asian, racial or minority ethnic (BAME) groups, migrants, refugees, or asylum seekers.
- The psychological intervention intended to treat a mental health condition according to the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5; American Psychiatric Association) or International Statistical Classification of Diseases and Related Health Problems (10th ed.; ICD-10)

and was modified to better support treatment delivery for the target population.

- The psychological intervention was compared with either an active or inactive control. Symptom severity of the mental health condition was measured using appropriate clinical outcome measures at end-of-treatment (defined as the first assessment after the intervention) and follow-up (defined as the longest timepoint available after the end of treatment)

The exclusion criteria were:

- Participants younger than age 18.
- Any interventions that were unadapted and non-EBTs. Studies were not excluded if participants were prescribed medication prior to psychological intervention, or pharmacological intervention that constituted as 'treatment as usual/care as usual'.
- Psychological interventions for autism spectrum disorder, attention deficit hyperactivity disorder, or mental disorders secondary to neurological events (e.g., post-stroke depression).
- Studies that did not have follow-up assessment and missing data (i.e., missing means and standard deviations) were excluded. Authors were contacted if there were missing data; RCTs were excluded if the authors did not respond with sufficient data.

Data Extraction and Coding

Data extraction and coding was performed using Microsoft Excel. All data were extracted independently by the author and another research team member (a PhD Student). Data were cross-checked for accuracy, with no discrepancies noted. The following information was recorded: authors, year of publication, the country where

the study was conducted, problem descriptor (Appendix Table B.1), ethnicity (Appendix Table B.2), intervention type, control type, treatment format (group or individual), number of sessions, duration of the treatment period, types of outcome measures used and continuous outcome data at post-treatment and follow-up. Mean and standard deviations for each outcome measure were extracted.

When studies had multiple follow-ups available, the longest follow-up time point (from the end of treatment) was chosen as this would provide the most information on the durability of treatment effects. Treatment duration was coded based on the number of sessions and weeks of each intervention reported by the study protocol. The type of control group was coded as either "active" (i.e., standard, unadapted intervention, or treatment as usual) or "inactive" (i.e., waitlist control/no intervention). Outcomes on relapse and attrition rates were not included in the analysis due to insufficient data.

Coding for the Adaptation Types

Frequencies and adaptation types were categorised according to the typology proposed by Arundell et al. (2021). This typology offers a framework to evaluate culturally adapted therapies, which is organised into three overarching core areas: therapist-related, content-related, and organisational-specific adaptations (Table 1).

Table 1

Conceptual Typology Proposed by Arrundel et al. (2021)

<table>
<tr><td colspan="5">TREATMENT-SPECIFIC ADAPTATIONS - Adaptations to intervention provided</td></tr>
<tr><td rowspan="2">Therapist-related adaptations
Focus on person(s) delivering intervention</td><td>Common Factors</td><td colspan="3">Specific adaptations</td></tr>
<tr><td>Therapeutic relationship
Alliance and Empathy; Agreement of treatment goals; Expectations of treatment; Patient feedback</td><td>Training for therapist/facilitator
Training for professional; Training for layperson</td><td>Language translation
Use of interpreter or bilingual therapist</td><td>Provider of treatment
Ethnic matching; Lay person or paraprofessional; Community or religious leader</td></tr>
<tr><td rowspan="2">Content-related adaptations

Focus on content of the intervention</td><td>Acceptability and suitability
Psychoeducation: Provision of support to prepare for the treatment</td><td>Language translation
Translated materials/resources</td><td colspan="2">Religious/faith-based adaptations
Use of religious texts, doctrine, or guidance; Involvement of religious figure</td></tr>
<tr><td colspan="4">Explicit ‘cultural’ adaptation of intervention content*
Culturally modified materials/resources; Culturally sensitive or congruent terms; Metaphors; Emphasis on cultural norms/expectations.</td></tr>
<tr><td colspan="5">ORGANISATION-SPECIFIC INTERVENTIONS - Adaptations at organisation/service level to provide intervention</td></tr>
<tr><td colspan="2" rowspan="2"></td><td colspan="3">Specific adaptations</td></tr>
<tr><td>Location of treatment
Care at home; Care in the community; Care in non-healthcare setting</td><td>Form used to provide treatment
Face to face; Telephone; Digital; Group treatment</td><td>Time /length of intervention
Variation in session length; Time of day for intervention</td><td>Method of access
Access route (e.g.,via alternative to standard route)</td></tr>
</table>

Note. *Explicitly reported cultural adaptations were considered in the typology relating as common factors and as a specific type of adaptation.

Meta-analytic Approach

Considerable heterogeneity was anticipated due to the varying sample populations, adaptations, and intervention designs. Thus, random effect models were used to calculate pooled mean effect sizes. Data were analysed in R using the "metafor" package (Viechtbauer, 2010) in four stages: (1) calculating effect size estimates for post-intervention and follow-up; (2) subgroup analyses between different subsamples of studies to investigate observed heterogeneity; (3) calculating effect sizes for different types of modification in culturally adapted intervention; and (4) moderator analysis using meta-regression.

Hedges' *g* was calculated to assess differences between culturally adapted interventions and control groups as Hedges' *g* is suggested to be more accurate than Cohen's *d* for reviews that have a small number of studies (Cuijpers, 2016). Furthermore, Hedges' *g* allows for comparing outcomes across studies that used different outcome measures by pooling variances and standardising outcomes (Lipsey and Wilson, 1993). Treatment effects were estimated using the standardised mean difference; calculated using sample sizes, raw means, and standard deviations (SD) from primary outcome measures. Effect sizes of 0–0.32, 0.33–0.55 and 0.56–1.2 are small, moderate and large, respectively (Lipsey and Wilson, 1993). All effect size estimates were accompanied by 95% confidence intervals (CIs). Effect sizes were calculated separately for post-intervention and follow-up to examine the effects of culturally adapted therapy. Negative standardised effect size estimates indicated that the intervention group improved more than the control group.

Heterogeneity between studies was calculated using the I^2 statistic, which estimates the proportion of variation in effect sizes due to real differences in effect sizes (Higgins & Green, 2011). Values of 25%, 50%, and 75% indicate low, moderate,

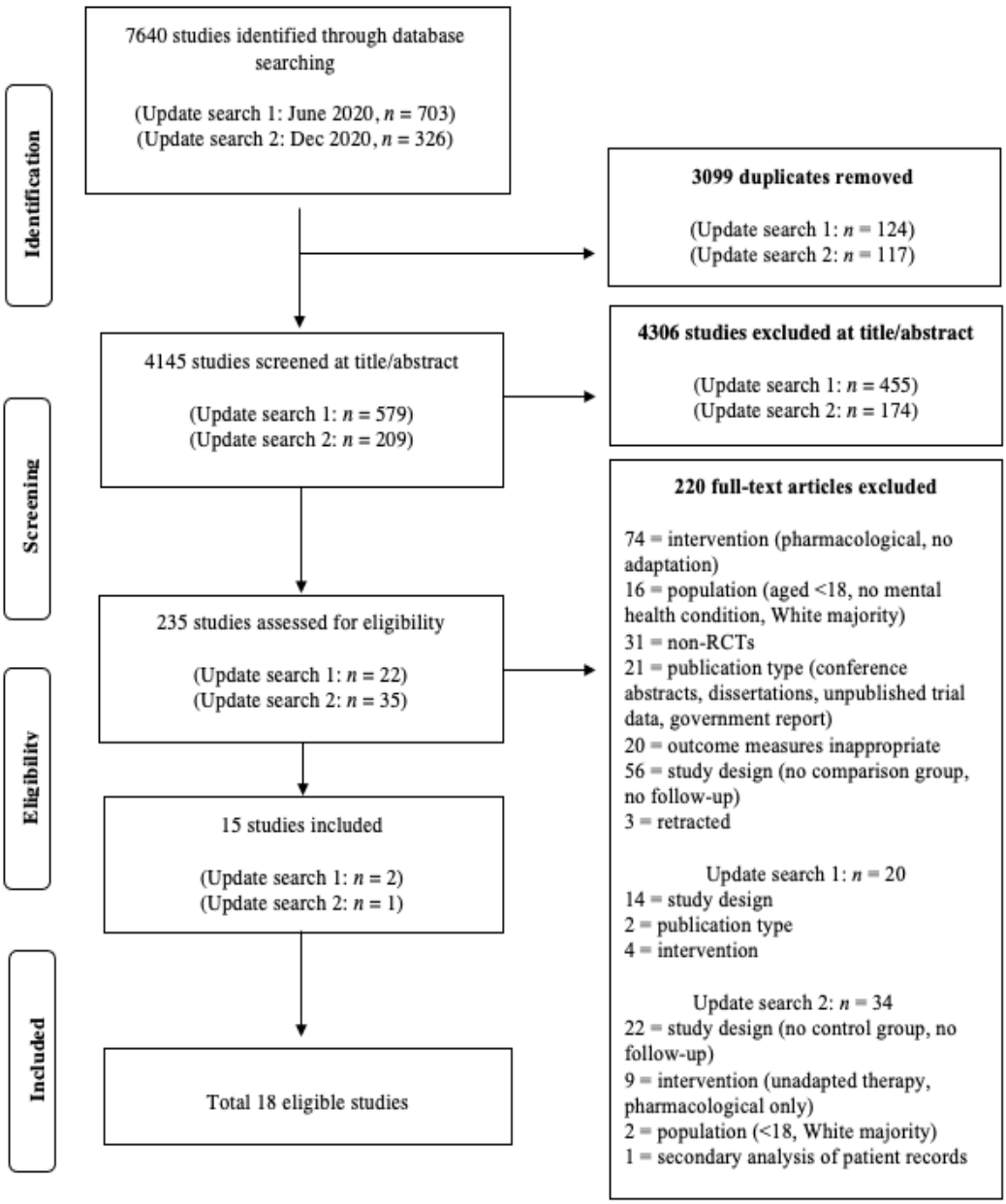
and considerable heterogeneity between trials, respectively. Subgroup analyses were conducted if there were a minimum of four trials per categorical subgroup (Fu et al., 2011) to examine whether the effectiveness of the intervention was affected by the length of follow-up, treatment format, control type, types of psychological intervention, and the quality of the study. Heterogeneity between subgroups was examined using Cochran's *Q* statistic, with a significant *Q*-statistics indicating that the effect sizes differed across subgroups. Univariate meta-regression models were then constructed to explore whether the effect sizes of adapted therapies were associated with the length of follow-up, types of adaptations, control types and risk of bias.

Quality assessment

Cochrane's risk of bias tool (Higgins et al., 2011) was used to evaluate the methodological quality of the RCTs included. Each study was assigned a low, high, or unclear risk of bias for each of the following six domains: adequate generation of random sequence, proper allocation concealment, blinding participants and personnel, blinding of outcome assessors (detection bias), selective outcome reporting, and adequately addressing attrition bias (Appendix C). The author and a PhD student of the research team independently carried out the risk of bias assessment on all included studies. Any disagreements between reviewers were resolved by discussion, including consensus meetings with additional senior reviewers. Publication bias was explored using funnel plots (Higgins & Green, 2008). The funnel plot is a scatterplot of study effect sizes plotted against standard error (SE). The absence of publication bias is determined by an asymmetric distribution of studies around the mean effect size, forming an inverted funnel (Sterne et al. 2005).

Results

Figure 1
Prisma Flow Diagram of Study Selection



For a PRISMA-adherent flow diagram of the steps for literature search and inclusion/exclusion, see Figure 1. An initial search yielded 7640 articles. A total of 4541 abstracts were screened after removing duplicates, 235 of which were read in full

to be assessed for eligibility; 15 studies met all inclusion criteria. Two updated searches were conducted in June and December 2020 to identify additional studies published after the initial search in April 2020, which identified three studies, resulting in 18 eligible studies.

Study Characteristics

Sample populations were drawn from eight countries with a total of 1903 participants at post-intervention and 1872 at follow-up. The largest sample consisted of 694 participants (Tol et al., 2020) while Hinton et al. (2011) had the smallest sample (*N*= 24). The most common adaptation was for Latinx communities (*K*=6; 33%), followed by Black or Mixed-raced groups (*K*= 4; 22%), refugees or asylum seekers (*K*=3; 16%) and East Asians (*K*=3; 16%). One study was conducted with a Jewish population, exploring spiritually integrated treatment (Rosmarin et al., 2010). Females comprised most of the total sample, with 39% of the studies (*K= 7)* conducted on only female participants (see Appendix D for an overview of study characteristics).

Intervention Characteristics

Length of follow-up ranged from 1-month (Acarturk et al., 2016; Beeber et al., 2010; So et al., 2015) to 12 months (Laperriere et al., 2015). Two studies (Choy & Lou., 2016; Dwight-Johnson et al., 2011) conducted follow-up assessments at two time points; data from the second follow-up point were extracted to ascertain treatment durability in that study. There were different follow-up intervals across studies: 1 month (*K*= 3), 6 weeks (*K* = 1), 6-8 weeks (*K* = 1), 10 weeks (*K* = 1), 3 months (*K* = 7), 6 months (*K* = 4), and 12 months (*K* = 1). Therefore, studies were categorised into: (1) less than 3 months (*K* = 6; 33%); (2) 3 months (*K* = 7, 44%); or (3) 6 months or more (*K* = 4; 22%) follow-up.

Regarding the type of problem descriptor, 13 studies (72%) focused on depression or anxiety; the remaining focused on other diagnoses such as psychotic conditions (*K* = 2), PTSD (*K* = 2) and mental health disorders not otherwise specified (*K* = 1). CA-CBT was the most common intervention utilised in 41% of the studies. Most of the interventions were delivered in a one-to-one format (*K* = 11, 67%). Five studies (28%) used a group format, and two (11%) used a self-directed format. In total, 56% (*K* =10) of the studies had active control groups, and 44% (*K* = 8) used waitlist or no-treatment controls (i.e., inactive controls). The duration of treatment ranged from two weeks (Rosmarin et al., 2010) to 24 weeks (Grote et al., 2009), with a mean of 10.50 weeks (*SD* = 6.37). The frequency of treatment ranged from four to 16 sessions with an average of 8.53 sessions (*SD* =3.71). Of note, none of the studies compared culturally adapted interventions to unadapted versions of the same intervention. The majority (*K*=12, 67%) of the studies targeted BAME populations or refugees/asylum seekers who lived in Western countries. The remaining studies were conducted in non-Western countries: Turkey (Acarturk et al., 2016); Hong Kong (Choy & Lau, 2016; So et al., 2015); Suriname (Hendricks et al., 2020); Malaysia (Shaw et al., 2018); and Uganda (Tol et al., 2020).

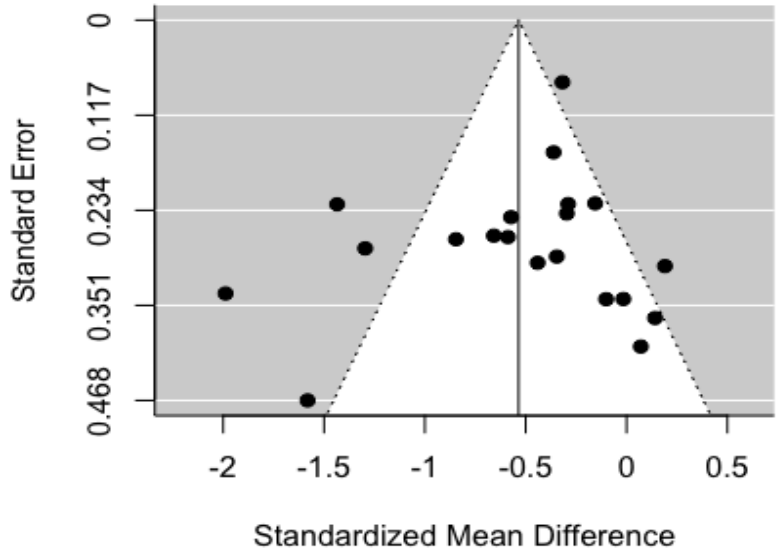
Quality of Included Studies

None of the included studies was deemed to have a high risk of bias. Half of the studies (*K*= 9; 50%) were rated as low risk of bias, and the remaining studies had unclear risk of bias (see Appendix C, Table C.2 for a full breakdown). For 15 studies, the randomisation processes were described in detail, and the remaining studies did not provide any details about this. Five studies provided information about allocation concealment. Ten studies reported the blinding of outcome assessors. Most RCTs reported attrition rates (*K* = 14; 78%), with reasons for attrition provided by 13 studies.

Two studies utilised completer analysis, whereas the remaining studies used intention-to-treat analyses in handling data loss to follow-up. The only study in which all participants completed the intervention was by Hinton et al. (2011). Four study protocols were accessible, and no reporting bias was observed. Lastly, the funnel plot for publication bias (Figure2) suggested a slight bias towards larger effects favouring culturally adapted interventions in smaller studies at follow-up.

Figure 2

Funnel Plots of All Studies at Follow-up



Are the Effects of Adapted Psychological Interventions Sustained Over Time?

Eighteen studies were considered for the meta-analysis. However, one study (Dwight-Johnson et al., 2011) had an extremely large effect size at follow-up as compared to other studies (i.e., effect size greater than 2; Appendix F Figure F.1). The large effect size in Dwight-Johnson et al. (2011) paper could be due to higher numbers of attrition at follow-up in the control group (n= 15) compared to intervention groups (n = 8). Furthermore, participants in the control group had significantly higher baseline scores and comorbidities than participants in the intervention group. When this study

was excluded in a sensitivity analysis, effect size decreased from g= -0.71, ([95% CI: -1.11, -0.30], p = .006) to g= -0.54,([95% CI: -0.78, -0.30], p <.001). Observed heterogeneity (I^2) also decreased from 93.70%. to 80.99%. Thus, a decision was made to remove the study from the main analysis, leaving 17 studies.

The effects of adapted interventions were evaluated at post-intervention and follow-up. All follow-up studies were collapsed into one group and investigated at the group level to address the main research question. Analysis across 17 studies at post-intervention showed a medium effect (g = -0.58, [95% CI: -0.82 -0.35], p <.001), indicating that adapted therapies were more effective in reducing symptom severity when compared to controls. Treatment effects were also maintained at follow-up with moderate effect size, (g = -0.54, [95% CI: -0.78 -0.30], p <.001). However, heterogeneity was substantial at post-intervention and follow-up. A sensitivity analysis excluding one study that had 1-year follow-up (Laperriere et al., 2015) - substantially longer than the other studies - did not alter this finding. The effect size remained the same and heterogeneity remained high (g = -0.54 [95% CI: -0.80 -0.28], p <.0001; I^2 = 80.73%). Heterogeneity was further explored using subgroup analyses and meta-regressions.

Table 2
Meta-analysis of Studies Stratified By Length of Follow-Up

Studies	*K* (comparisons)	Hedges' *g* (95% CI)	*p*	I^2
Post-intervention				
All	17 (20)	-0.58 (-0.82, -0.35)	<.001	78.99%
Less than 3-months	6 (6)	-0.71 (-1.27, -0.16)	.011	86.84%
3-months	8 (11)	-0.47(-0.70, -0.26)	<.001	46.53%
6-months or more	3 (3)	-0.59 (-1.32, 0.14)	.114	82.18%
Follow-up				
All	17 (20)	-0.54(-0.78, -0.30)	<.001	80.56%
Less than 3-months	6 (6)	-0.68(-1.16, -0.19)	.006	81.89%
3-months	8 (11)	-0.43 (-0.45, 0.21)	<.001	0.00%
6-months or more	3 (3)	-0.73 (-1.97, 0.50)	.245	93.28%

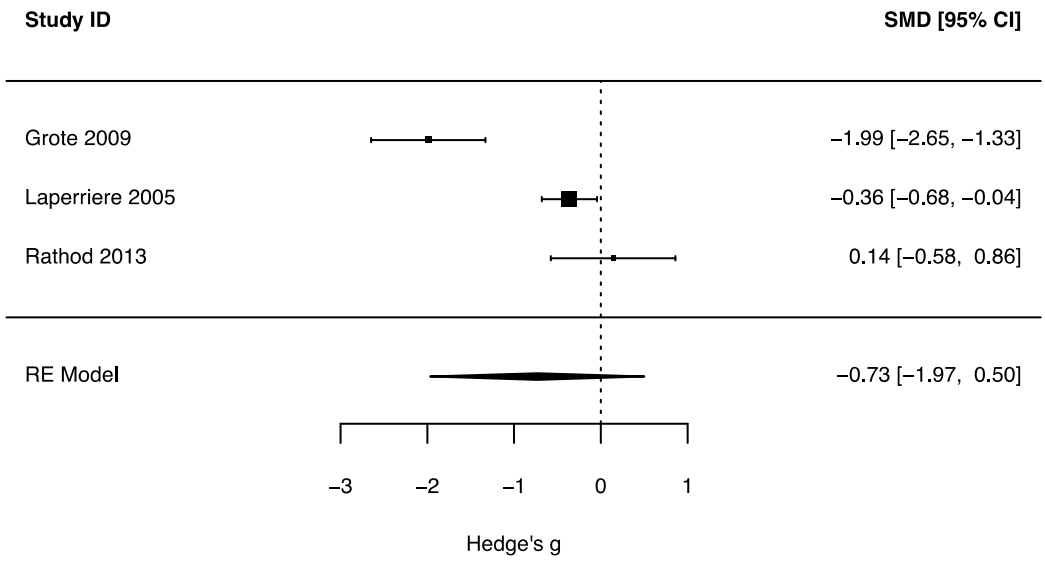
Effect Sizes for Different Lengths of Follow-Up

The effect sizes of varying lengths of follow-up were investigated. The results suggested that treatment gains were sustained at less than 3-months and 3-months follow-up, favouring culturally adapted interventions (Table 2). Treatment effects were greater at less than 3-months (g = -0.68, [95% CI: -1.16, -0.19], p = .006), than 3-months follow-up (g = - 0.43, [95% CI: -0.45, 0.21], p <.001). Heterogeneity was substantial at less than 3-months follow-up (82%); there was minimal heterogeneity at 3-months follow-up (I^2 = 0%).

No statistically significant effect was observed between adapted and control groups for the three studies that had 6-months or more follow-up. The effect size obtained was large (g = -0.73, [95% CI: -1.97, 0.50]) with wide confidence intervals, indicating that studies varied in terms of sustained effects. A forest plot suggested that Grote et al. (2009) and Laperriere et al. (2005) exhibited sustained effects at follow-up (Figure 3) but not Rathod et al. (2013). Rathod and colleagues (2013) postulated

that the non-significant results between treatment and control groups might be due to sub-optimal therapy offered to participants.

Figure 3
Forest Plot of Studies at 6-months or More Follow-up



Subgroup Analyses. Table 3 presents the results of subgroup analyses conducted for all studies at follow-up. Effect sizes in favour of adapted interventions were near identical when compared to active (g = 0.53, [95% CI: -0.91 -0.15], p = .006) and inactive control groups (g = 0.54, [95% CI: -0.88, -0.22], p= .001). Larger effect sizes were observed for interventions delivered in individual formats (g = -0.66, [95% CI: -1.01, -0.32], p = .002) than in groups (g = -0.31 [95% CI: -0.43 -0.18], p <.001). The difference between subgroups was marginally significant (p = .043, I^2 = 72.59%). The quality of studies also influenced effect size. As none of the included studies were deemed to have a high risk of bias, subgroup analyses were conducted to compare the difference between studies that had low and unclear risk of bias. Studies that had low risk of bias had larger effect sizes (g = -0.61, [95% CI: -0.91, -0.30], p<*.0001*) than studies that had unclear risk of bias (g = -0.32, [95% CI: -0.54, -0.11], p =.003). However, this difference between subgroups was not significant (p = .674; I^2 = 0%).

Analysis was also conducted to examine if effect sizes differed between target populations, with full results presented in Appendix G, Table G.3. The results suggested that for refugees or asylum seekers, adapted interventions were significantly more effective than controls at post-intervention (g = -1.03, [95% CI: -1.53, -0.54], p <.001) and follow-up (g = -0.65, [95% CI: -1.16, -0.14], p <.001). Heterogeneity was substantial at both time points.

Table 3
Meta-analyses at Follow-up for Different Study Characteristics

	K (comparisons)	Hedges' *g* (95% CI)	*p*-value	I^2
Control type				
Active	9 (10)	-0.53 (-0.91, -0.15)	.006	85.01%
Inactive	8 (10)	-0.54 (-0.88, -0.22)	.001	77.16%
Treatment format				
Group	5 (6)	-0.31 (-0.43 -0.18)	<.0001	0.00%
Individual	12 (14)	-0.66 (-1.01, -0.32)	.0002	79.75%
Risk of bias				
Low risk	12 (14)	-0.61 (-0.91 -0.30)	<.0001	83.40%
Unclear risk	5 (6)	-0.32 (-0.54, -0.11)	.003	0.00%

Effectiveness of CA-CBT for Depression or Anxiety

Meta-analyses were conducted to explore the effectiveness of treatment types on target conditions. As CA-CBT was the most adapted EBT (*K =7)* and had a sufficient sample for meta-analysis (i.e., minimum of four trials; Fu et al., 2011) only CA-CBT was considered in these analyses. Other studies provided interventions adapted from the following principles: IPT (*K* = 2), Acceptance and Commitment Therapy (*K* = 2), BA (*K* = 1), EMDR *(K* = 1), Instrumental Reminiscence Intervention *(K* = 1), Meta-cognitive training *(K* = 1), Positive Psychology *(K* = 1).

Six out of the seven studies investigating CA-CBT were focused on anxiety or depression, whereas two studies (Acarturk et al., 2016; Hinton et al., 2011) examined the effectiveness of CA-CBT for patients with PTSD. Due to small number of studies

that examined PTSD, a meta-analysis was conducted to examine the efficacy of CA-CBT for anxiety or depression. Results showed that CA-CBT was efficacious in reducing anxiety and depressive symptoms at post-intervention (g = -0.34, [95% CI: -0.65, -0.04], p = .025) and this effect was sustained at follow-up (g = -0.33, [95% CI: -0.54, -0.12], p= .002). Low heterogeneity across studies was detected at post-intervention, and zero heterogeneity was found at follow-up (Table 4). Subgroup analysis between active and inactive controls was not conducted due to insufficient studies.

Table 4
Meta-analyses of CA-CBT on Depression and Anxiety

Time point	Control type	*K* (comparisons)	Hedges' *g* (95% CI)	*p*-value	I^2
Post-intervention	All	5 (7)	-0.34 (-0.65, -0.04)	.025	20.91%
Follow-up	All	5 (7)	-0.33 (-0.54, -0.12)	.002	0.00%

Most Frequently Implemented Culturally Adapted EBTs and Impact on Durability

Table 5 presents the number of studies reporting each modification type. In the following sections, the results are organised according to the typology (Arundell et al., 2021): adaptations made at the overarching level, common factor adaptations, and specific adaptations. Within each section, the most common types and effectiveness of adaptations are reported.

Table 5
Frequency of Treament Specific Adaptations

Treatment-Specific Adaptations				
	Common Factors	Specific adaptations		
Therapist-related adaptations	Therapeutic relationship (*K =5*)	Training for therapist/facilitator (*K =7*)	Language translation (*K =9)*	Provider of treatment (*K =3)*
Content-related adaptations	Acceptability and suitability (*K= 16*)	Language translation (*K =4)*	Religious/faith-based adaptations (*K=2*)	
	Explicit 'cultural' adaptation of intervention content* (*K= 15*)			
Organisation-Specific Interventions				
	Specific adaptations			
	Location of treatment (*K = 4*)	Form used to provide treatment (*K = 4*)	Time, length of intervention (*K = 4*)	Method of access (*K = 1*)

Note. Below each adaptation type is the number of studies that reported adjustments made to tailor interventions. Explicitly reported cultural adaptations were considered in the typology regarding both their inclusion in the common factors model and as a specific type of adaptation.

Treatment-specific and Organisational-specific Cultural Adaptations

All included studies made content-related adaptations to reflect the cultural needs of the target populations. A total of 10 studies made therapist-related adaptations, and ten reported organisation-level modifications to increase treatment engagement and retention. Overall, 71% of the studies (*K* = 14) adapted more than one area, with

35% *(K* = 6) of studies making adaptations to all overarching areas. For more detailed information on areas of adaptation, see Appendix H.

Effectiveness of Adaptations. Adaptations made to any of the overarching areas were effective in reducing symptom severity. Observed post-intervention effect sizes were moderate for therapist-related adaptations (*g* = -0.55, [95% CI: -0.91, -0.19], *p* = .003) and organisational adaptations (*g* = - 0.71, [95% CI: -0.95, -0.37], *p* <.001). However, the benefits of adapted interventions were smaller at follow-up when analyses were stratified by adaptation type (Table 6). Considerable heterogeneity was observed for all adaptations made at both time-points, ranging from 76.04% to 85.45%. Comparable effect sizes at follow-up were consistently observed for different control types, suggesting culturally adapted therapies were more effective than any control group.

Table 6
Meta-analyses for Overarching Adaptation Areas

Time point	Control types	*K* (Number of comparisons)	Hedges' g (95% CI)	*p*-value	I^2
Therapist-related					
Post-intervention	All	10 (13)	-0.55(-0.91, -0.19)	.003	85.45%
Follow up	All	10 (12)	-0.41(-0.69, -0.12)	.005	76.04%
	Active	7 (7)	-0.35 (-0.48, -0.22)	<.001	0.00%
	Inactive	4 (5)	-0.35 (-0.94, 0.24)	.240	84.33%
Content-related					
Post-intervention	All	17 (20)	-0.54(-0.78, -0.29)	<.001	80.99%
Follow-up	All	17 (20)	-0.54(-0.78, -0.30)	<.001	80.56%
	Active	8 (10)	-0.54 (-0.88, -0.22)	.001	76.00%
	Inactive	9 (10)	-0.53 (-0.91, -0.15)	.007	85.01%
Organisational related					
Post-intervention	All	11 (12)	-0.71 (-0.95, -0.37)	<.0001	79.87%
Follow-up	All	10 (12)	-0.42 (-0.66, -0.19)	.0003	68.63%
	Active	5 (5)	-0.32 (-0.45. -0.20)	<.001	0.00%
	Inactive	5 (7)	-0.52 (-0.92, -0.13)	.009	72.43%

Common Factor Adaptations

Common factors such as enhancing therapeutic relationships, treatment acceptability and explicit cultural adaptations are crucial for culturally adapted interventions. The most frequently reported adaptations made at the common-factor level were interventions tailored to increase the acceptability and suitability of treatment (K = 16, 94%), followed by interventions that explicitly reported modifications to treatment content (K = 15, 88%). For instance, Gonyea et al. (2016) renamed dementia as "memory problems" and used the term "educational session" instead of "talking therapy" to increase accessibility of psychological interventions. Similarly, Feldman et al. (2016) considered the importance of family support and provided psychoeducation for participants and their family members to increase the acceptability of treatment within the Latinx/Hispanic communities. Other studies explicitly reported modifications to treatment content by incorporating culturally specific metaphors (Muto et al., 2010) or religious texts (Rosmarin et al., 2010). Adjustments to improve therapeutic relationships were reported in five studies (29%). These involved setting shared treatment goals (Grote et al., 2009) and providing pre-intervention interviews to establish rapport (Choy & Lou, 2016).

Effectiveness of Common Factor Adaptations. All forms of common factor adaptations were effective in reducing psychopathology in the target population; post-intervention treatment effects were maintained at follow-up with medium effect size for all common factor domains (Table 7). Medium effect sizes were observed for explicit cultural adaptations (g = -0.55, [95% CI: -1.08, -0.08], p <.001), treatment acceptability and suitability (g = -0.54, [95% CI: -0.80, -0.27], p <.001), and therapeutic relationship adaptations (g = 0.63, [95% CI: -1.11, -0.14], p = .011).

Substantial heterogeneity was observed at post-intervention and follow-up for all common factor adaptations (Table 7).

The differences between studies that made therapeutic-relationship adaptations and those that did not were explored using subgroup analyses. Studies that made therapist-related adaptations yielded a larger effect than those that did not (g = -0.48, [95% CI: -0.77, -0.19], p = .001), suggesting that adaptations to the therapeutic relationship were beneficial in reducing symptom severity. However, the difference between subgroups was not significant (p = .61; $I2$ = 0%). Exploratory subgroup analyses on control types were conducted to explore if different types of control groups were associated with effect sizes. Subgroup analyses no significant differences between the types of controls for acceptability and suitability of treatment as well as explicit cultural adaptations (Table 7). Lastly, sensitivity analysis was conducted by removing two self-administered intervention studies (Muto et al., 2011; Rosmarin et al., 2010) where therapeutic adaptation was not possible. The effect size remained unchanged following this (Appendix E).

Table 7
Meta-analyses For Common Factors

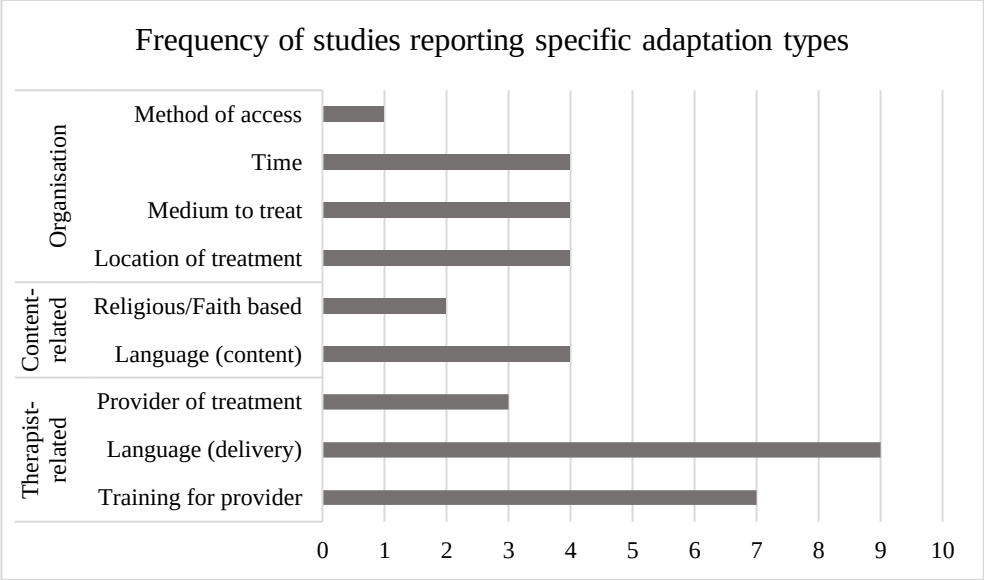
Common factors	Time point	*K* (comparisons)	Hedges' *g* (95% CI)	*p*-value	I^2
Therapist-related adaptation					
Therapeutic relationship	Post-intervention	5 (7)	-0.70 (-1.05, -0.36)	<.001	55.67%
	Follow-up	5 (7)	-0.63 (-1.11, -0.14)	.011	77.08%
Content-related adaptation					
Acceptability and suitability	Post-intervention	16 (19)	-0.59 (-0.84, -0.34)	<.001	80.33%
	Follow-up	16 (19)	-0.54 (-0.80, -0.27)	<.0001	81.99%
	Active	8 (9)	-0.54 (-0.97, -0.11)	.014	87.53%
	Inactive	8 (10)	-0.54 (-0.88, -0.19)	.002	74.62%
Explicit cultural adaptations	Post-intervention	15 (18)	-0.59 (-0.86, -0.32)	<.001	76.61%
	Follow-up	15 (18)	-0.55 (-0.83, -0.27)	<.001	78.01%
	Active	7 (8)	-0.58 (-1.08, -0.08)	.024	83.61%
	Inactive	8 (10)	-0.54 (-0.88, -0.19)	.002	74.62%

Specific Adaptation Types

Details of specific adaptations are presented in Figure 4. The most frequent reported adaptations were therapist-related specific adaptations. Nine studies had therapists or interpreters that spoke the same language as the participants (i.e., language translation), followed by cultural competence training (*K* = 7) and ethnic matching *(K = 3*). For content-related specific adaptations, four studies made language adaptations (i.e., translating treatment material) and two that incorporated religious texts into treatment. Frequently made modifications for organisational-specific adaptations were treatment location (*K = 4*), treatment medium (*K = 4*) and time (*K = 4*). These included providing treatment at easily accessible locations and services such as transportation to and from the research site.

Figure 4

Frequency of Specific Adaptations (K = 17)



Note. Language (content)= language translation (content); Language (delivery)= language translation (delivery) Time= time or length of treatment.

Effectiveness of Specific Adaptation Types. Meta-analyses were conducted for the most frequently occurring specific adaptation types with four or more studies per adaptation type. Results suggested that any interventions making cultural adaptations were more effective than control interventions (Table 8). Overall, effect sizes were consistently higher at post-intervention than follow-up. Effect sizes ranged from moderate to large (g = -0.52 to -0.99) at post-intervention while effect sizes were small to moderate (g = -0.31 to -0.53) at follow-up. Considerable heterogeneity across studies was observed for all specific adaptations (I^2 from 60.93% to 84.64%), except for therapist training provided where low heterogeneity was observed (I^2 = 34.61%).

At follow-up, the largest effect size was observed for interventions that made language (delivery) adaptations (i.e., used an interpreter or bilingual therapist). A moderate effect size was observed in favour of language (delivery) adaptations when compared to any control groups (g = -0.53, [95% CI: -0.84, -0.22] p <.001). In contrast, smaller effect sizes were observed for: training therapists (g = -0.32, [95% CI: -0.47,

-0.22], p <.001), ethnic matching (g = -0.34, [95% CI: -0.46, -0.17], p < .001), translated material (g = -0.32, [95% CI: -0.45, -0.17], p <.001), location (g = -0.31, [95% CI: -0.44, -0.18], p <.001), and the medium used to provide treatment (g = -0.31, [95% CI: -0.44., -0.18], p <.001). Heterogeneity was substantial for language (delivery) adaptations and time of intervention at follow-up (Table 8).

Subgroup analysis was not conducted for other adaptation types due to insufficient studies per subgroup. Overall, significant beneficial effects were found for the following: therapist-related (language, training, and ethnic matching; content-related (translated material); and organisational adaptations (medium to provide treatment, time adjustments).

Table 8

Meta- analyses for Most Frequently Occurring Specific Adaptations

Specific adaptation type	Time	Control type	*K* (comparison)	Hedges' *g* (95% CI)	*p*	I^2
Therapist-specific adaptation: therapist related						
Language (delivery)	Post-intervention	All studies	9 (11)	-0.57 (-0.96, -0.18)	.004	84.60%
	Follow-up	All studies	9 (11)	-0.53 (-0.84, -0.22)	<.001	75.49%
		Active	6 (7)	-0.35 (-0.48, -0.22)	<.001	0.00%
		Inactive	3 (4)	-0.69 (-1.39, - .003)	.051	80.71%
Training for therapist/facilitator	Post-intervention		7 (9)	-0.52 (-0.72, -0.32)	<.001	34.61%
	Follow-up	All	7 (9)	-0.32 (-0.47, -0.22)	<.001	0.00%
Provider	Post-intervention		4 (5)	-0.59 (-0.99, -0.07)	.003	60.93%
	Follow-up	All	4 (5)	-0.34 (-0.47, -0.20)	<.001	0.00%
			Cultural-related adaptations			
Language translation (content)	Post-intervention	All	4 (4)	-0.36 (-0.75,0.03)	.069	68.72%
	Follow-up	All	4 (4)	-0.32 (-0.45, -0.18)	<.001	0.01%
			Organisational adaptations			
Form used to provide treatment	Post-intervention		4 (4)	-0.68 (-1.05, -0.32)	.0003	75.51%
	Follow-up	All	4 (4)	-0.31 (-0.44, 0.18)	<.001	0.00%
Location	Post-intervention		4 (4)	-0.68 (-1.05, -0.32)	.001	75.51%
	Follow-up	All	4 (4)	-0.31 (-0.44, -0.18)	<.001	0.00%
Time	Post-intervention		5 (5)	-0.99 (-1.60, -0.40)	.001	84.64%
	Follow-up	All	5 (5)	-0.73 (-1.53, -0.06)	.069	91.21%

Meta-regressions

Between-study heterogeneity was further explored using meta-regressions. Univariate meta-regressions were conducted with the following variables to explore their association with treatment effects: study characteristics (i.e., target condition, control types, risk of bias length of follow-up, treatment format); and adaptation types (overarching, common factors, and specific adaptations). Only PTSD was significantly associated with increased effectiveness when compared to other mental health conditions (β=-1.00, [95% CI: -1.78, -0.21], *p* =; Table 8). No other study characteristics and adaptation types predicted association with treatment effects of follow-up studies (Appendix I).

Further analysis was conducted by adding control types into the model as Arundell et al. (2021) found that PTSD was significantly associated with increased effectiveness after adjusting for control types. Findings obtained from the current review showed that PTSD remained a significant predictor when controlling for control type (β=-1.00, [95% CI: -1.79, -0.18], *p* = .016).

Table 9

Meta-regression on Target Condition

K	Model	Variable	Coefficient	SE	*p*	95% CI	R^2
20	1	Target condition [a]					
		Depression	-0.034	.208	. 893	-0.53, 0.46	21.37%
		PTSD	-0.99	.401	.013	-1.78, -0.21	
		Psychosis	0.658	.403	.102	-1.13, 1.45	
		Mental health NOS	0.172	.420	.681	-0.68, 0.99	
20	2	Target condition [a]					
		Depression	-0.03	.257	.906	-0.55, 0.47	10.88%
		PTSD	-0.99	.411	.016	-1.79, -0.18	
		Psychosis	0.66	.412	.103	-0.13, 1.48	
		Mental health NOS	0.20	.458	.661	-0.70, 1.10	
		Inactive control [b]	0.04	.220	.897	-0.40, 0.46	

[a] reference category = anxiety; [b] reference category = active control; PTSD = post-traumatic stress disorder

Discussion

This meta-analysis evaluated the long-term effects of culturally adapted psychological therapies and ascertained the types of adaptations that were associated with sustained treatment effects over time. Seventeen RCTs met the inclusion criteria for this review, with 1903 participants at post-intervention and 1872 at follow-up. Most of the studies (57%) targeted BAME communities who lived in Western countries such as the United States and the United Kingdom. The remaining studies were conducted with refugees seeking asylum in Turkey, Malaysia, and Uganda, while two were conducted with locals from Hong Kong and Suriname.

Durability of Treatment Effects

In accordance with existing evidence (e.g., Griner & Smith, 2006; Hall et al., 2016; Arundell et al., 2021), this meta-analysis found that culturally adapted EBTs were associated with decreased mental health symptoms compared to both unadapted active and inactive control groups at post-intervention. Treatment effects were moderate and sustained at follow-up. Substantial heterogeneity at post-intervention and follow-up indicated great variability in effectiveness between studies.

Mirroring Griner and Smith's (2006) findings, subgroup analyses revealed that adaptations in one-to-one therapy appeared to be more efficacious than adaptations for group therapies, possibly due to the opportunity to have a more tailored session compared to a group-based intervention. Results from the meta-regression suggested that individuals who had PTSD were more likely to benefit from culturally adapted therapies when compared to anxiety disorder at follow-up.

A small effect size was found for CA-CBT for anxiety and depression, favouring CA-CBT overall control types at post-intervention and follow-up. Unlike Ng and Wong (2018)'s review, the present review had a smaller number of included studies

and greater variability within the populations and the mental health conditions studied, contributing to the smaller effect sizes observed. Nonetheless, there was robust evidence for the efficacy of CA-CBT for symptoms of anxiety or depression, with minimal heterogeneity observed between the included studies.

Durability of Treatment Effects by Follow-up Intervals

There was substantial variability in follow-up time points for culturally adapted interventions. When studies were stratified by different follow-up intervals, effect sizes of culturally adapted interventions diminished as the length of follow-up increased. A moderate effect was observed at less than 3-months follow-up, while a small effect was observed at 3-month follow-up. No significant differences in symptom severity were found between culturally adapted interventions and controls at 6-months or more follow-up. These findings support earlier reviews by demonstrating that the effectiveness of adapted and unadapted psychological therapies for BAME populations only persisted up to 3-months (Purotago et al.,2018; Rojas-Garcia et al., 2015).

The diverse populations included in this review and the suboptimal number of sessions provided (as reported in Rathod et al., 2013) may have contributed to diminished treatment effects at 6 -months or more post-treatment. Cultural differences between ethnicities may have implications for treatment, ranging from different views on the aetiology of mental health problems to differences in beliefs about treatments (Chowdhary et al., 2014). Earlier reviews have demonstrated that interventions adapted to a homogenous cultural group were more effective than interventions provided to groups of individuals from various cultural backgrounds (Griner & Smith., 2006; Rojas-Garcia et al., 2015). In this meta-analysis, all studies that reported follow-ups at 6-months or more were conducted with ethnically diverse

populations, likely contributing to the attenuated treatment effects at follow-up. For instance, the sample of the Rathod et al. (2013) trial included participants who self-identified as Black Caribbean, Black African, South Asian, and Iranian, while participants in Grote et al. (2009) self-identified African American, Latinx, or Biracial. Therefore, the treatment content of adapted interventions may have lacked specificity for these diverse participants.

There is a possibility that some of the participants in these studies had relapsed by the follow-up assessment(s), but as none of the included studies examined reasons for diminished treatment effects and attrition rates were under-reported, the incidence of relapse is unknown. Future work investigating factors contributing to the lack of treatment effects at longer follow-up may elucidate diminished treatment effects at follow-up. Taken together, the findings showed that treatment effects were sustained up to three months post-intervention, with low heterogeneity between studies, but there was more variability as the length of follow-up increased.

Most Frequently Implemented Adaptation Types and Effectiveness

Most Frequently Reported Adaptation Types

At the common-factor level, all included studies reported adaptations to treatment content by incorporating culturally relevant norms. Most studies modified treatment content to increase treatment accessibility and cultural relevance, whist ten studies reported therapist-related or organisational adaptations. In terms of specific adaptation types, most included studies reported therapist-related adaptations. These included providing treatment in the client's native language via interpreters or bilingual therapists. Other commonly reported specific adaptations included translating treatment materials and making treatments more accessible (e.g., by changing the location, time, or length of sessions).

Effectiveness of Adaptation Types at Follow-up

Cultural adaptations in all overarching areas were beneficial in reducing symptom severity compared to any control types, although treatment effects were notably smaller at follow-up. Beneficial effects of the following adaptation types persisted at follow-up: common factors (acceptability and suitability, therapeutic relationship) and specific adaptations (language delivery, language translation).Consistent with earlier meta-analytic reviews (Arundell et al., 2021; Shehadeh et al.,2016; Smith et al., 2011), the superiority of one adaptation types over the other could not be demonstrated as 71% of studies incorporated adaptations across multiple domains. These findings imply that researchers may have adapted across multiple elements to maximise the intervention effectiveness and address the complex nature of adapting therapies (Shehadehet al.,2016). Furthermore, limited descriptions of adaptation types and processes made it difficult to disentangle which adaptation types were associated with sustained treatment effects. For instance, Feldman et al. (2016) reported modifying treatment content to address culture without further details.

Given prior evidence demonstrating that ethnic minorities rated treatment providers' knowledge of discrimination as significantly more critical in their psychotherapy than their White counterparts (Meyer & Zane, 2013), none of the studies conducted in Western countries reported if treatment adaptation included themes relating to race and discrimination. Participants' ethnicity and experiences of being discriminated against in Western countries may influence treatment processes (Bernal & Saez-Santiago, 2006). For instance, African American clients within a community mental health team reported valuing therapists' knowledge and awareness of race and discrimination in treatment (Ward, 2015). Therefore, therapists

who lack cultural sensitivity may risk re-traumatising clients due to their lack of knowledge of race, culture, and discrimination.

Furthermore, most of the included studies that made therapist-related adaptations underreport what constitutes 'cultural competency' training. Only one study (Beeber et al., 2010) reported that therapists were trained to understand Latinx culture and taught strategies to work effectively with interpreters. The lack of consistent description across studies might mask differences in how adaptations have been made, contributing to some of the observed heterogeneity.

Nonetheless, results illustrated that any form of language adaptation was associated with sustained treatment effects. These findings align with Bernal et al. (2009) 's suggestion that language is one of the most fundamental areas for cultural adaptation in therapy. Language differences have been found to impact treatment engagement and outcome (Snowden et al., 2007). Additionally, treatment engagement is associated with the therapist's ability to navigate conversations about differences (e.g., illness belief, culture, race) and integrate patients' perspectives into treatment (Aggarwal et al., 2016). Therefore, providing clients' native languages via an interpreter, translated materials, or having bilingual treatment providers might increase BAME communities' access to treatment and their engagement in treatment.

Strengths and Limitations

This study extended existing literature on culturally adapted therapies by demonstrating the durability of treatment effects. This review took a granular approach to categorise and evaluate cultural adaptations using the typology developed by Arundell et al. (2021). By including only RCTs, the present review sought to improve methodological rigour. The Cochrane risk of bias tool was used independently by two reviewers to evaluate the risk of bias in included studies. None of the included studies

was rated as having a high risk of bias. Although the funnel plot showed a slight bias for smaller studies with large effects favouring culturally adapted interventions at follow-up, sensitivity analyses revealed negligible changes in effect sizes when studies with unclear risk of bias were removed. This implies that publication bias does not seem to be a substantial threat to the results obtained.

There are several limitations to consider when interpreting these findings. Firstly, the results are constrained by the small number of studies that met inclusion criteria, which may have reduced statistical power. There is also a possibility that some RCTs were missed as searches were restricted to trials published in the English language.

Secondly, there was substantial heterogeneity between studies owing to the variability in intervention design, targeted populations, settings (countries), diagnoses and follow-up intervals. Variability in follow-up intervals has been commonly observed in meta-analyses examining the long-term effects of psychotherapies for adults (Flückiger et al., 2014). The present study collapsed follow-up intervals into three groups, which may not provide the best estimate of treatment effects. Establishing consistent follow-up intervals would improve the precision of long-term effect size estimates. Caution is needed to interpret findings obtained from subgroup analyses due to the small number of studies per subcategories. The limited number of studies per subgroup may mask differences between subgroups due to inadequate power, and findings have limited ability to inform treatment decisions or adaptation processes.

Despite evidence supporting culturally adapted EBTs, there remains limited information on whether adapted EBTs are more effective than unadapted versions of the same treatment, as none of the included studies examined this. Theoretically,

cultural adaptations would provide a significant improvement on targeted outcome measures in comparison to unadapted therapies. Therefore, more research is needed to examine whether adapted and unadapted psychological therapy produced equal benefits for the intended populations.

Recommendations and Implications

Researchers could examine the durability of treatment effects by having long-term follow-ups at more than one time point. Having multiple time points allows investigators to examine treatment effectiveness across time, increasing opportunities to capture relapses of mental health problems over time and study the relationship between the number of sessions and the durability of treatment outcomes. Furthermore, repeated follow-ups may improve statistical power and enable the investigation of moderators that may vary with time.

As Burrow-Sánchez et al. (2011) suggested, guidelines are needed to inform researchers what constitutes cultural adaptation and document this process. Limited reporting of adaptation types and processes precludes evaluation, implementation and replication in research and clinical practice (Cabassa & Baumann, 2013). Future research providing more transparent descriptions of cultural adaptation processes could facilitate comparison between studies and improve transferability of findings beyond the research context.

Although the Arundell et al. (2021) typology has not been validated, it provides a systematic method for evaluating and understanding adaptation types. Additional studies utilising this typology will aid in refining it. Future research could also investigate whether a combination of adaptation types increases the durability of treatment rather than a single adaptation. This would involve testing two or three differentially adapted versions of an existing EBT.

Stronger integration between cultural adaptation and implementation science is warranted (Cabassa & Baumann, 2013). Since culturally adapted interventions aim to reduce treatment gaps for underserved populations (e.g., Cooper et al., 2013), future work may consider including implementation outcomes, such as the ease of accessing treatment from service users' perspectives, cost-effectiveness, and sustainability treatment in the community. Cabassa and Baumann (2013) also suggested that collaborations between communities, clinicians and researchers could increase the ecological validity of cultural adaptation trials. For instance, researchers or service providers could conduct qualitative surveys with stakeholders to illuminate the lack of treatment effect at follow-up.

Additionally, measuring risk factors associated with relapses such as residual symptoms at the end of treatment, history of mental health conditions, and presence of comorbidity may provide more information about the lack of sustained effects at follow-up. Information about implementation outcomes, risk factors and reports from stakeholders may elucidate whether treatment effectiveness attenuates over time due to ineffectiveness of treatment, contextual factors (e.g., ongoing stressors encountered by clients) or incorrectly implemented EBTs (e.g., insufficient treatment sessions). This information could inform policymakers and funders in considering the feasibility of adopting adapted interventions, particularly in settings with limited resources, time, or expertise. Conversely, these findings could provide incentives to increase funding for training and targeted funding for each element of adaptation types across levels such that the overall effectiveness of treatment delivery can be improved.

Taken together, findings from this study point towards the following four recommendations: (1) longer-term follow-ups in trials; (2) clearer descriptions of the cultural adaptations made and the processes by which they were developed; (3)

consistent reporting of treatment engagement and attrition*;* and *(*4) consistent use of implementation outcome measures. The application of these recommendations should provide considerable advances to knowledge about cultural adaptions to psychological therapies.

Conclusions

This systematic review and meta-analysis evaluated the long-term effects of culturally adapted EBTs, and the elements of cultural adaptations associated with sustained treatment effects. Based on 17 studies, a moderate effect was found favouring culturally adapted interventions over control groups at post-intervention and follow-up. When studies were stratified by duration of follow-up, effect sizes diminished as the length of follow-up increased. Treatment effects persisted up to 3-months post-treatment but not at six months or more. The durability of treatment effects was particularly evident in studies that made language and content adaptations to increase the accessibility and suitability of treatment. The superiority of one area of adaptation over the other could not be evaluated as most studies made adaptations in more than one area. Further research is required to establish the longer-term benefits of culturally adapted therapies with more follow-up time points. Additionally, studies that report adaptation processes and types will improve precision in identifying which adaptation types yield the most effective results for BAME and non-Western communities.

References

Acarturk, C., Konuk, E., Cetinkaya, M., Senay, I., Sijbrandij, M., Gulen, B., & Cuijpers, P. (2016). The efficacy of eye movement desensitization and reprocessing for post-traumatic stress disorder and depression among Syrian refugees: Results of a randomized controlled trial. *Psychological Medicine, 46*(12), 2583–2593.

Alegria, M., Ludman, E., Kafali, E. N., Lapatin, S., Vila, D., Shrout, P. E., … Canino, G. (2014). Effectiveness of the Engagement and Counseling for Latinos (ECLA) intervention in low-income Latinos. *Medical Care, 52(*11), 989–997.

Ali, S., Rhodes, L., Moreea, O., McMillan, D., Gilbody, S., Leach, C., ... & Delgadillo, J. (2017). How durable is the effect of low intensity CBT for depression and anxiety? Remission and relapse in a longitudinal cohort study. *Behaviour Research and Therapy, 94*, 1-8.

Amri, S., & Bemak, F. (2013). Mental health help-seeking behaviors of Muslim immigrants in the United States: Overcoming social stigma and cultural mistrust. *Journal of Muslim Mental Health, 7*(1).

Arundell, L. L., Barnett, P., Buckman, J. E., Saunders, R., & Pilling, S. (2021). The effectiveness of adapted psychological interventions for people from ethnic minority groups: A systematic review and conceptual typology. C*linical Psychology Review,* 102063.

Beck, A. (2016). *Transcultural cognitive behaviour therapy for anxiety and depression: A practical guide*. Routledge.

Bedi, R. P. (2018). Racial, ethnic, cultural, and national disparities in counseling and psychotherapy outcome are inevitable but eliminating global mental health

disparities with indigenous healing is not. *Archives of Scientific Psychology, 6*(1), 96.

Beeber, L. S., Holditch-Davis, D., Perreira, K., Schwartz, T. A., Lewis, V., Blanchard, H., … Davis Goldman, B. (2010). Short-term in-home intervention reduces depressive symptoms in Early Head Start Latina mothers of infants and toddlers. R*esearch in Nursing & Health, 33*(1), 60–76.

Benish, Quintana, & Wampold, B. E. (2011). Culturally adapted psychotherapy and the legitimacy of myth: A direct-comparison meta-analysis. *Journal of Counseling Psychology*, *58*(3), 279–289. https://doi.org/10.1037/a0023626

Bernal, G., Jiménez-Chafey, M. I., & Domenech Rodríguez, M. M. (2009). Cultural adaptation of treatments: A resource for considering culture in evidence-based practice. P*rofessional Psychology: Research and Practice, 40*(4), 361.

Bernal, G., & Sáez-Santiago, E. (2006). Culturally centered psychosocial interventions. *Journal of Community Psychology, 34*(2), 121-132.

Bhui, K., Aslam, R. W., Palinski, A., McCabe, R., Johnson, M. R. D., Weich, S., … Szczepura, A. (2015). Interventions designed to improve therapeutic communications between black and minority ethnic people and professionals working in psychiatric services: A systematic review of the evidence for their effectiveness. *Health Technology Assessment, 19*(31), vii–173.

Buckman, J. E., Underwood, A., Clarke, K., Saunders, R., Hollon, S. D., Fearon, P., & Pilling, S. (2018). Risk factors for relapse and recurrence of depression in adults and how they operate: A four-phase systematic review and meta-synthesis. *Clinical Psychology Review, 64,* 13-38.

Castro, F. G., Barrera Jr, M., & Holleran Steiker, L. K. (2010). Issues and challenges in the design of culturally adapted evidence-based interventions. *Annual Review of Clinical Psychology, 6*, 213-239.

Chowdhary, N., Jotheeswaran, A. T., Nadkarni, A., Hollon, S. D., King, M., Jordans, M. J. D., … Patel, V. (2014). The methods and outcomes of cultural adaptations of psychological treatments for depressive disorders: A systematic review. *Psychological Medicine, 44(*6), 1131–1146.

Choy, J. C. P., & Lou, V. W. Q. (2016). Effectiveness of the Modified Instrumental Reminiscence Intervention on Psychological Well-Being Among Community-Dwelling Chinese Older Adults: A Randomized Controlled Trial. The American Journal of Geriatric Psychiatry. *Journal of the American Association for Geriatric Psychiatry, 24*(1), 60–69.

Clarke, K., Mayo-Wilson, E., Kenny, J., & Pilling, S. (2015). Can non-pharmacological interventions prevent relapse in adults who have recovered from depression? A systematic review and meta-analysis of randomised controlled trials. *Clinical Psychology Review, 39*, 58-70.

Collado A., Calderon M., MacPherson L., & Lejuez C. (2016). The Efficacy of Behavioral Activation Treatment among Depressed Spanish-Speaking Latinos. *Journal of Consulting and Clinical Psychology, 84*(7), 651–657.

Cooper, L. A., Ghods Dinoso, B. K., Ford, D. E., Roter, D. L., Primm, A. B., Larson, S. M., … Wang, N.-Y. (2013). Comparative effectiveness of standard versus patient-centered collaborative care interventions for depression among African Americans in primary care settings: The BRIDGE Study. *Health Services Research, 48*(1), 150–174.

Cuijpers, P., Berking, M., Andersson, G., Quigley, L., Kleiboer, A., & Dobson, K. S. (2013). A meta-analysis of cognitive-behavioural therapy for adult depression, alone and in comparison with other treatments. *The Canadian Journal of Psychiatry, 58*(7), 376-385.

David, E. J. R. (2010). Cultural mistrust and mental health help-seeking attitudes among Filipino Americans. *Asian American Journal of Psychology, 1*(1), 57.

Degnan, A., Baker, S., Edge, D., Nottidge, W., Noke, M., Press, C. J., … Drake, R. J. (2018). The nature and efficacy of culturally adapted psychosocial interventions for schizophrenia: A systematic review and meta-analysis. *Psychological Medicine, 48*(5), 714–727.

Dobson, K. S., Hollon, S. D., Dimidjian, S., Schmaling, K. B., Kohlenberg, R. J., Gallop, R. J., Rizvi, S. L., Gollan, J. K., Dunner, D. L., & Jacobson, N. S. (2008). Randomized trial of behavioural activation, cognitive therapy, and antidepressant medication in the prevention of relapse and recurrence in major depression. Journal of Consulting and Clinical Psychology, 76(3), 468–477. https://doi.org/10.1037/0022-006X.76.3.468

Drisko, J. W. (2004). Common Factors in Psychotherapy Outcome: Meta-Analytic Findings and Their Implications for Practice and Research. *Families in Society, 85(*1), 81–90. h

Dwight-Johnson, M., Aisenberg, E., Golinelli, D., Hong, S., O'Brien, M., & Ludman, E. (2011). Telephone-based cognitive-behavioral therapy for Latino patients living in rural areas: A randomized pilot study. *Psychiatric Services (Washington, D.C.), 62(*8), 936–942.

Feldman, J. M., Matte, L., Interian, A., Lehrer, P. M., Lu, S. E., Scheckner, B., … al, et. (2016). Psychological treatment of comorbid asthma and panic

disorder in Latino adults: Results from a randomized controlled trial. *Behaviour Research and Therapy, 87,* 142-154.

Fu, R., Gartlehner, G., Grant, M., Shamliyan, T., Sedrakyan, A., Wilt, T. J., ... & Trikalinos, T. A. (2011). Conducting quantitative synthesis when comparing medical interventions: AHRQ and the Effective Health Care Program. *Journal of Clinical Epidemiology, 64*(11), 1187-1197.

Gauthier, G., Mucha, L., Shi, S., & Guerin, A. (2019). Economic burden of relapse/recurrence in patients with major depressive disorder. *Journal of Drug Assessment, 8*(1), 97-103.

Gonyea, J. G., Lopez, L. M., & Velasquez, E. H. (2016). The Effectiveness of a Culturally Sensitive Cognitive Behavioural Group Intervention for Latino Alzheimer's Caregivers. *The Gerontologist, 56*(2), 292–302.

Green, B. L., Krupnick, J. L., Chung, J., Siddique, J., Krause, E. D., Revicki, D., ... & Miranda, J. (2006). Impact of PTSD comorbidity on one-year outcomes in a depression trial. J*ournal of Clinical Psychology, 62(*7), 815-835.

Griner, D., & Smith, T. B. (2006). Culturally adapted mental health intervention: A meta-analytic review. *Special Issue: Culture, Race, and Ethnicity in Psychotherapy, 43*(4), 531–548.

Grote, N. K., Swartz, H. A., Geibel, S. L., Zuckoff, A., Houck, P. R., & Frank, E. (2009). A randomized controlled trial of culturally relevant, brief interpersonal psychotherapy for perinatal depression. *Psychiatric Services, 60*(3), 313–321.

Halvorsrud, K., Nazroo, J., Otis, M., Hajdukova, E. B., & Bhui, K. (2018). Ethnic inequalities and pathways to care in psychosis in England: a systematic review and meta-analysis. *BMC medicine, 16*(1), 1-17.

Hall, G. C. N., Ibaraki, A. Y., Huang, E. R., Marti, C. N., & Stice, E. (2016). A Meta-Analysis of Cultural Adaptations of Psychological Interventions. *Behavior Therapy*, *47*(6), 993–1014.

Heim, E., & Kohrt, B. A. (2019). Cultural adaptation of scalable psychological interventions. *Clinical Psychology in Europe*, *1*(4), 1-22.

Higgins, J., & Green, S. (2011). Identifying and measuring heterogeneity. In *Cochrane Handbook for Systematic Reviews of Interventions* (5.1.0). The Cochrane Collaboration.

Higgins, J. P. T., Altman, D. G., Gøtzsche, P. C., Jüni, P., Moher, D., Oxman, A. D., … Sterne, J. A. C. (2011). The Cochrane Collaboration's tool for assessing risk of bias in randomised trials. *BMJ*, *343*.

Hinton, D. E., Chhean, D., Pich, V., Safren, S. A., Hofmann, S. G., & Pollack, M. H. (2005). A randomized controlled trial of cognitive-behavior therapy for Cambodian refugees with treatment-resistant PTSD and panic attacks: A cross-over design. *Journal of Traumatic Stress*, *18*(6), 617–629.

Hinton, D. E., Hofmann, S. G., Rivera, E., Otto, M. W., & Pollack, M. H. (2011). Culturally adapted CBT (CA-CBT) for Latino women with treatment-resistant PTSD: a pilot study comparing CA-CBT to applied muscle relaxation. *Behaviour Research and Therapy*, *49*(4), 275–280.

Hollon, S. D., Stewart, M. O., & Strunk, D. (2006). Enduring effects for cognitive behaviour therapy in the treatment of depression and anxiety. *Annual. Review. Psychology.*, *57*, 285-315.

Huey Jr, S. J., & Pan, D. (2006). Culture-responsive one-session treatment for phobic Asian Americans: A pilot study. Special issue: Culture, race, and ethnicity in psychotherapy. *Psychotherapy*, *43*(4), 549–554.

Interian A., Lewis-Fernandez R., & Dixon L.B. (2013). Improving treatment engagement of underserved U.S. racial-ethnic groups: A review of recent interventions. *Psychiatric Services*, *64*(3), 212–222. https://doi.org/10.1176/appi.ps.201100136

Kalibatseva, Z., & Leong, F. T. (2014). A critical review of culturally sensitive treatments for depression: Recommendations for intervention and research. *Psychological Services*, *11*(4), 433–450.

Keating, F. (2009). African and Caribbean men and mental health. *Ethnicity and Inequalities in Health and Social Care*, *2*(2), 41-51.

Keating, F., & Robertson, D. (2004). Fear, black people and mental illness: a vicious circle?. *Health & social care in the community*, *12*(5), 439-447.

King, K. M., & Summers, L. (2020). Predictors of broaching: Multicultural competence, racial color blindness, and interpersonal communication. *Counselor Education and Supervision*, *59*(3), 216-230.

Kirmayer, L. J. (2012). Cultural competence and evidence-based practice in mental health: Epistemic communities and the politics of pluralism. *Social Science & Medicine*, *75*(2), 249-256.

Laperriere, A., Antoni, M. H., Grossman, A., Ironson, G. H., Ishii, M., Jones, D., … Pomm, H. (2005). Decreased depression up to one year following CBSM+ intervention in depressed women with AIDS: the smart/EST women's project. *Journal of Health Psychology*, *10*(2), 223–231.

Lipsey, M. W., & Wilson, D. B. (2001). *Practical Meta-Analysis*. SAGE Publications.

Marsella, A. J. (2009). Diversity in a global era: The context and consequences of differences. *Counselling Psychology Quarterly*, *22*(1), 119-135.

Memon, A., Taylor, K., Mohebati, L. M., Sundin, J., Cooper, M., Scanlon, T., & de Visser, R. (2016). Perceived barriers to accessing mental health services among black and minority ethnic (BME) communities: a qualitative study in Southeast England. *British Medical Journal, 6*(11), e012337.

Meyer, O. L., & Zane, N. (2013). The influence of race and ethnicity in CLIENTS'EXPERIENCES of mental health treatment. *Journal of Cmmunity Psychology*, *41*(7), 884-901.

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & Group, T. P. (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLOS Medicine,6*(7), 1–6.

Miranda, J., Azocar, F., Organista, K. C., Dwyer, E., & Areane, P. (2003). Treatment of depression among impoverished primary care patients from ethnic minority groups. *Psychiatric Services (Washington, D.C.)*, *54*(2), 219–225.

Miranda, J., Snowden, L. R., & Legha, R. K. (2020). Policy effects on mental health status and mental health care disparities. In *The palgrave handbook of American mental health policy* (pp. 331-364). Palgrave Macmillan, Cham.

Morris, R. M., Sellwood, W., Edge, D., Colling, C., Stewart, R., Cupitt, C., & Das-Munshi, J. (2020). Ethnicity and impact on the receipt of cognitive–behavioural therapy in people with psychosis or bipolar disorder: an English cohort study. *British Medical Journal*, *10*(12), e034913.

Muto, T., Hayes, S. C., & Jeffcoat, T. (2011). The effectiveness of acceptance and commitment therapy bibliotherapy for enhancing the psychological health of Japanese college students living abroad. *Behavior Therapy*, *42*(2), 323–335.

Ng, T. K., & Wong, D. F. K. (2018). The efficacy of cognitive behavioral therapy for Chinese people: A meta-analysis. *Australian & New Zealand Journal of Psychiatry, 52*(7), 620-637.

NHS Digital (2019). *Outcomes for treatment for anxiety and depression.* Retrieved fromhttps://www.ethnicity-facts-figures.service.gov.uk/health/patient-outcomes/outcomes-for-treatment-for-anxiety-and-depression/latest

National Institute for Clinical Excellence (NICE). (2005). *Posttraumatic stress disorder: The management of PTSD in adults and children in primary and secondary care.* London: Gaskell–British Psychological Society.

National Institute for Clinical Excellence (NICE) (2009). *CG90 Depression: treatment and management of depression in adults*. Retrieved from: Retrieved from: www.nice.org.uk/Guidance/CG90

Purgato, M., Gastaldon, C., Papola, D., Van Ommeren, M., Barbui, C., & Tol, W. A. (2018). Psychological therapies for the treatment of mental disorders in low- and middle-income countries affected by humanitarian crises. *Cochrane Database of Systematic Reviews*, (7).

Rathod, S., Phiri, P., Harris, S., Underwood, C., Thagadur, M., Padmanabi, U., & Kingdon, D. (2013). Cognitive behaviour therapy for psychosis can be adapted for minority ethnic groups: A randomised controlled trial. *Schizophrenia Research*, *143*(2), 319–326.

Revicki, D. A., Siddique, J., Frank, L., Chung, J. Y., Green, B. L.,Krupnick, J., et al. (2005). Cost-effectiveness of evidence-based pharmacotherapy or cognitive– behavior therapy compared with community referral for predominately low-income minority women. *Archives of General Psychiatry, 62,* 868 – 875.

Rojas-Garcia, A., Ruiz-Perez, I., Rodriguez-Barranco, M., Bradley, D. C. G., Pastor-Moreno, G., & Ricci-Cabello, I. (2015). Healthcare interventions for depression in low socioeconomic status populations: a systematic review and meta-analysis. *Clinical Psychology Review*, *38*, 65-78.

Rosmarin, D. H., Pargament, K. I., Pirutinsky, S., & Mahoney, A. (2010). A randomized controlled evaluation of a spiritually integrated treatment for subclinical anxiety in the Jewish community, delivered via the Internet. *Journal of Anxiety Disorders*, *24*(7), 799–808.

Shaw, S. A., Ward, K. P., Pillai, V., & Hinton, D. E. (2019). A group mental health randomized controlled trial for female refugees in Malaysia. *American Journal of Orthopsychiatry*, *89*(6), 665.

Shehadeh, M. H., Heim, E., Chowdhary, N., Maercker, A., & Albanese, E. (2016). Cultural adaptation of minimally guided interventions for common mental disorders: a systematic review and meta-analysis. *JMIR mental health*, *3*(3), e5776.

Snowden, L. R. (2007). Explaining mental health treatment disparities: Ethnic and cultural differences in family involvement. *Culture, Medicine and Psychiatry*, *31*(3), 389-402.

So, S. H.-W., Chan, A. P., Chong, C. S.-Y., Wong, M. H.-M., Lo, W. T.-L., Chung, D. W.-S., & Chan, S. S. (2015). Metacognitive training for delusions (MCTd): Effectiveness on data-gathering and belief flexibility in a Chinese sample. *Frontiers in Psychology*, *6*.

Sterne, J. A., Becker, B. J., & Egger, M. (2005). The funnel plot. *Publication bias in meta-analysis: Prevention, Assessment and Adjustments*, 75-98.

Stewart, R. E., & Chambless, D. L. (2009). Cognitive–behavioral therapy for adult anxiety disorders in clinical practice: A meta-analysis of effectiveness studies. *Journal of Consulting and Clinical Psychology, 77*(4), 595.

Vahdaninia, M., Simkhada, B., Van Teijlingen, E., Blunt, H., & Mercel-Sanca, A. (2020). Mental health services designed for Black, Asian and Minority Ethnics (BAME) in the UK: a scoping review of case studies. *Mental Health and Social Inclusion*.

Van Loon A., Van Schaik A., Dekker J., & Beekman A. (2013). Bridging the gap for ethnic minority adult outpatients with depression and anxiety disorders by culturally adapted treatments. *Journal of Affective Disorders, 147*(1–3), 9–16. https://doi.org/10.1016/j.jad.2012.12.014

Viechtbauer, W. (2010). Conducting meta-analyses in R with the metafor package. *Journal of Staistical Software, 36*(3), 1–48.

Wampold, B. E. (2015). How important are the common factors in psychotherapy? An update. *World Psychiatry: Official Journal of the World Psychiatric Association (WPA), 14*(3), 270–277.

Ward, E. C., & Brown, R. L. (2015). A culturally adapted depression intervention for African American adults experiencing depression: Oh Happy Day. *The American Journal of Orthopsychiatry, 85*(1), 11–22.

Yasmin-Qureshi, S., & Ledwith, S. (2020). Beyond the barriers: South Asian women's experience of accessing and receiving psychological therapy in primary care. *Journal of Public Mental Health, 20* (1), 3-14.

Zhang, N., & Burkard, A. (2008). Client and counsellor discussions of racial and ethnic differences in counselling: an exploratory investigation. *Journal of Multicultural Counselling and Development, 36*, 77–87.

Part 2: Empirical Paper

The Impact of Ethnicity on The Trajectory of Depression Symptom Change During Psychological Interventions

Abstract

Objectives: Uncovering variations in depression symptom change across ethnic groups during psychological intervention could improve understanding of differences in treatment response. This study aimed to: (1) identify trajectories of change in treatment; (2) ascertain if depression symptom trajectories varied between BAME and White populations; (3) investigate if sociodemographic and treatment variables predicted association with the identified trajectories; and (4) examine if ethnic groups predicted different trajectory memberships.

Methods: Adults (N = 17109) with depression and recorded ethnicity were included in the analysis. Depressive symptoms were measured using the Patient Health Questionnaire-9, and co-occurring anxiety was measured using the Generalised Anxiety Disorder-7. Growth Mixture Modelling (GMM) was employed to identify trajectories of symptom change, and multinomial logistic regressions were used to identify ethnicity and other pre-treatment variables associated with trajectory membership.

Results: GMM resulted in three depression trajectories of change and four anxiety trajectories. There was a high proportion of patients who did not respond to treatment. Pre-treatment variables that predicted Non-response were: ethnic minority, unemployment, living in deprived area, prescribed medications, higher baseline anxiety and depression scores, and long-term physical health conditions. Asian patients had higher odds than White patients to be association with trajectories that had high severity for both outcome measures. Black, Other, Mixed-heritage and Chinese populations were no different from White populations in depressive treatment responses after adjusting for index of multiple deprivation (IMD).

Conclusions: Results have implications for identifying patients who are at risk of non-response such that clinicians can tailor culturally sensitive interventions for ethnic minority patients.

Introduction

Depression is one of the most common mental health difficulties experienced globally, affecting quality of life, as well as social and occupational functioning (World Health Organisation, 2017). Ethnic disparities in the prevalence of depression and treatment outcomes between Black, Asian, and Minority Ethnic (BAME) and White populations exist despite the successive inquiries into inequalities (Cabinet Office, 2017; Public Health England, 2018). BAME communities often encounter barriers in accessing psychological interventions (Hussain & Cochrane, 2004). Those who do access treatment often present with more debilitating depressive symptoms and are less likely to experience symptom recovery than their White counterparts (Williams et al., 2012). Additionally, deterioration rates in routine treatment services are higher in ethnic minorities compared to White ethnicities (NHS Digital, 2020).

Ethnic Variation in Psychological Intervention

To address the increasing burden of depression as well as anxiety disorders in the community and enact on the evidence base for the effectiveness of psychological therapies for depression, the English government launched the Improving Access to Psychological Therapies (IAPT) programme to promote greater and more equitable access to treatment (Gyani et al., 2013). The National Institute for Health and Care Excellence (NICE, 2010) guidelines recommend several psychological interventions for adults with depression, including Cognitive Behavioural Therapy (CBT) and Interpersonal Psychotherapy (IPT). As these therapies are developed based on Western philosophies and understandings of mental illness (Benish et al., 2011), some have suggested that these interventions are less generalisable for BAME populations who may have different health beliefs and help-seeking behaviours compared to people from White Western backgrounds. Indeed, a systematic review concluded that

therapists who incorporated patients' interpretations of presenting problems into treatment significantly improved treatment engagement and retention for ethnic minorities in the U.K and U.S. (Aggarwal et al., 2016). Additionally, culturally adapted interventions were found to be effective in alleviating depressive symptoms (Anik et al., 2020), and the potential durability of these interventions was reported in Chapter One.

Profound treatment disparities were found where Black African/Caribbean and Asian patients were less likely to receive evidence-based interventions such as CBT for depression (Mansour et al., 2020); and those who did receive CBT had significantly fewer treatment sessions than their White counterparts(Morris et al., 2020). Treatment gaps could be attributed to interactions between patient factors (e.g., cultural differences in expression of depression, mistrust towards healthcare) and therapist factors (e.g., not adequately trained to provide culturally sensitive treatment (Beck & Naz, 2019). While therapists may endorse the modification of interventions to incorporate cultural influences (Bassey & Melluish, 2012), some may lack the confidence and skills to navigate conversations about patients' culture and experiences with racism (Naz et al., 2019). Therapists who failed to broach conversations about religious or cultural beliefs at the outset of intervention may result in ethnic minorities experiencing mental health services as inaccessible and insensitive to their needs (Memon et al., 2016).

Despite exponential growth in research on ethnic disparities in *accessing* primary care psychological therapy, few studies examined ethnic variation in treatment *outcomes*. Research into ethnic disparities using naturalistic samples has been hindered by a lack of available data on ethnicity, specifically a lack of information on the diverse ethnic groups of the wider population. For instance, a

recent meta-analysis (Wakefield et al., 2021) that reviewed treatment outcomes in IAPT services found that 27 out of 47 (51%) studies failed to provide ethnicity data. Studies that provided ethnicity data varied in the number of details; most data were reported as sample descriptive statistics without investigating ethnic variation in treatment outcomes for anxiety and depression.

Studies that explored the impact of ethnicity on treatment outcomes in IAPT services suggest that BAME patients benefited equally from psychological therapy as White patients (Clark et al., 2009; Mercer et al., 2019). Clark and colleagues (2009) concluded that depression scores and recovery rates from pre- to post-treatment did not differ significantly between BAME and White patients, although there was some variation with 50% recovery rates for White, 66% for Asian, 54% for Black, and 50% for other ethnicities. However, this conclusion was based on 134 White and 114 BAME patients; each ethnic group may have been underpowered to show any statistical difference in the pre-and post-test averaged means. Moreover, the averaged group means at two time-points assumed all patients had the same patterns of recovery. However, Delgadillo et al. (2016a) found that patients from Asian, Mixed-heritage and Other ethnic groups, on average, had higher post-treatment depressive symptoms than White patients. This disparity was magnified for BAME patients who resided in socially deprived areas (defined by the index of multiple deprivation measures; Smith et al., 2015) and had long-term health conditions. Therefore, it appears that ethnic minorities who resided in socially deprived areas were less likely to experience similar symptom recovery when compared to White patients.

Overall, current evidence from primary care services has offered conflicting information on ethnic variation in treatment outcomes. Moreover, the pre-and post-test analyses used in these studies compared group means of final symptom change,

neglecting possible variation in the rate at which BAME patients respond to treatment compared to White patients, potentially biasing interpretations of any ethnic variation in outcomes. One avenue to further explore this is through the influence of ethnicity on session-by-session treatment responses and outcomes.

Trajectories of Symptom Change

The introduction of patient-focused research such as latent growth curves and growth mixture modelling (GMM) may help overcome the limitations of pre-and post-test analysis of symptom change in psychotherapy research. These approaches use session-by-session outcome measures to investigate interindividual changes and identify and classify subgroups of individuals (i.e., classes) with similar patterns of symptom change (Muthén, 2006). Predictors of these classes and the rate of change over time can be modelled within the same framework. Findings from patient-focused research have shown the benefits of examining and tracking session-by-session treatment progress (e.g., Delgadillo et al., 2018). Such feedback systems enable the comparison of patients' responses to treatment to the population norm, subsequently informing clinicians of the risk of inadequate treatment response (Lambert et al., 2018).

Research has typically found between two to five statistically distinct trajectories of depressive symptoms among outpatients who received psychological interventions for depression (Cuijpers et al., 2005; Owen et al., 2015; Saunders et al., 2019; Stulz et al., 2010). Most patients appear to either respond (i.e., treatment responders) or not respond to treatment (i.e., Non-responders) (Owen et al., 2015; Saunders et al., 2019), but there are variations in the specific forms of symptom change for these groups: treatment responders can be further classified into different patterns

of change suggestive of early response or slow response (i.e., late treatment responder).

Early responders are characterised by a substantial decrease in symptomology once treatment commences (Lutz et al., 2017). These patients tend to have superior outcomes at post-intervention than those who were in a slow responder trajectory (Lutz et al., 2017; Stulz et al., 2007). Additionally, treatment gains tend to sustain at follow-up (Lutz et al., 2014). Characteristics of slow responders were reported by Saunders et al. (2019), who found that patients with moderately severe symptoms at pre-treatment assessment made rapid improvements after the sixth session and continued to improve until the end of therapy. Similarly, Stulz et al. (2007) found a group of patients who demonstrated rapid improvement at the sixth session, and this group of patients ended treatment with minimal depressive symptoms.

However, research into trajectories had not considered whether there are ethnic variations in the rates of symptom change as ethnic minorities may require longer to build therapeutic relationships with therapists with whom they do not share cultural or religious backgrounds (Hall et al., 2016). Qualitative studies conducted with BAME communities found the following as barriers to treatment engagement: discomfort in expressing emotions and differing beliefs (Yasmine-Qureshi et al., 2020); language barriers, unreliable interpreters, and distrust in interpreter service due to perceived non-confidentiality of interpreters from the same community and negative experiences of previous service use (Loewenthal et al.,2012).

Given that there is evidence suggesting a greater level of unmet need for mental healthcare within the BAME than within the White community (Cooper et al., 2013), there is a possibility that BAME patients may either take longer to longer to treatment or not responding at all. This may be attributed to the therapists needing

more time at the initial phase of therapy to better understand BAME communities' unique needs before incorporating their cultural beliefs into treatment. However, the paucity of trajectories research among ethnic minorities in the U.K. means that these hypotheses have not been formally tested. If this were to be demonstrated in future studies, the findings might highlight a critical area of training for staff and service providers. In particular, services and therapists can consider offering more personalised treatment planning by incorporating culturally relevant information. Therefore, knowing that a subgroup of patients may take longer to respond to treatment is crucial to ensure equitable care to BAME communities with the National Health Service constitution for England- providing fair and equitable service for all (Department of Health and Social Care, 2012).

Ethnic Variation in Depression Trajectories

When examining ethnic differences in depression trajectories, most studies were published in America. These studies employed a longitudinal life course perspective to understand the role of social disadvantages and their impact on the prevalence and severity of depression among ethnic minorities (e.g., Liang et al., 2011). Core to this perspective is that ethnic disparities in depression symptoms and treatment outcomes result from a constellation of various socio-contextual factors. Social determinants of mental health such as unemployment, lower income, and living in deprived areas (Alegria et al., 2018) increase ethnic minorities' risk of adverse mental health outcomes. Racism and discrimination operating at interpersonal and societal levels further perpetuate stress and social disadvantage experienced by BAME communities (Williams, 2018). The consequences of these factors ultimately manifest as higher symptom severity observed at the beginning of treatment for ethnic disparities in depressive symptoms (Bailey et al., 2019).

Yet few studies have evaluated whether ethnicity is associated with different depression treatment responses during psychological treatment. Research that included ethnicity as a predictor (e.g., Lin & Farber, 2020; Saunders et al., 2019; Trombello et al., 2020) did not find any association between ethnicity and trajectory membership. For instance, Trombello et al. (2020) examined ethnic variation between White, Latinx, African American and Other Ethnic groups during eight sessions of behavioural activation for depression. Compared to the White ethnicity groups, there were no significant differences in the likelihood of ethnic minority groups belonging to a moderate-severity recovery class relative to the high-severity non-responders class**.** Given that Trombello and colleagues' study (2020) had only 105 participants, the study could be underpowered to detect any ethnic variation. To the author's knowledge, only one study in the U.K. (Saunders et al., 2019) included ethnicity as a predictor of trajectory membership. However, ethnicity was examined as a binary predictor (White versus BAME group), which may conceal nuances in treatment responses between different ethnic groups.

Other Variables Associated with Depression Trajectories

Knowledge of factors associated with poor prognosis can be useful for clinicians to optimise treatment, particularly for BAME patients. A recent meta-analytic review from non-trajectory research using individual patient data from randomised control trials (Buckman et al., 2021) found that higher baseline depressive symptom severity, longer duration of depression symptoms before treatment, history of using antidepressant medications, and higher comorbid anxiety were associated with poorer treatment prognosis independent of treatment received (i.e., pharmacological/psychological). Analysis from IAPT datasets indicates that age, employment status, and initial symptom severity may also be associated with

outcomes (Saunders et al., 2021; Saunders et al., 2016). Therefore consideration of these variables may be crucial to determine the independent effect of ethnicity on treatment response. Lastly, evidence from depression trajectory research suggests that older age, being female, unemployed, having comorbid physical health conditions, lower socio-economic status and living in deprived areas increases the probability of having a poor treatment response trajectory (McDevitt-Petrovic et al., 2019; Stulz et al., 2007; Stochl et al., 2021). However, others found no significant associations between age, gender, medication status and depression trajectories (Saunders et al.,2019; Trombello et al., 2020). The inconsistencies in sociodemographic variables could be attributed to differences in psychological intervention offered, treatment duration, and populations sampled. In contrast, clinical variables such as higher initial symptom severity, lower work and social functioning, and higher anxiety comorbidity were found to be associated with treatment non-response across studies (Amati et al.,2018, Cuijpers et al.,2014; Gyani et al., 2013; Saunders et al., 2019; Stoch et al., 2021).

Taken together, there are gaps in current research relating to ethnic variation in depression symptom change during psychological treatment, frequently due to insufficient ethnicity data. Inaccurate or missing ethnicity data is a common issue in U.K. population health research, particularly when using naturalistic clinical samples (Saunders et al., 2013). The lack of data can be partly attributed to healthcare professionals' beliefs that asking patients' ethnicity would alienate BAME patients and offend them and assumptions that ethnicity data have no relevance for treatment (Iqbal et al., 2012). A lack of ethnicity data could hamper efforts to routinely monitor access and treatment engagement. This raises concerns about whether primary care services meet the needs of BAME communities.

Prior studies conducted in primary care settings found conflicting results about ethnic variation in treatment outcomes. Pre-and post-test analyses neglect possible nuanced variations in change across different ethnic groups and how they compare with White patients. Therefore, GMM can be employed to examine individual differences in treatment responses, for example by ethnicity group, while considering patient characteristics (e.g., sociodemographic, pre-treatment symptom severity) to identify patients at risk of poor treatment response. This approach is in line with Nazroo and colleagues (2020)'s suggestion that researchers should include socio-contextual variables alongside ethnicity when examining health disparities as mental health difficulties are inextricably linked with social and economic disadvantages. Similarly, the "No Health Without Mental Health" policy developed by the Department of Health (2011) stresses the importance of considering wider social determinants that affect the mental health of BAME communities as social adversities (unemployment, income gap) greatly impacts BAME populations more than White populations.

Research Objectives

Using a large naturalistic outpatient sample from various IAPT services in North and Central East London, this study investigated ethnic variation in trajectories of response to psychological therapy for depression. Firstly, the study examined ethnicity in binary terms (White vs BAME population), then extended previous research by exploring the association between ethnic groups and symptom trajectories. Ethnic variation in treatment response will then be examined along with other sociodemographic and baseline clinical characteristics. Given the high co-occurrence and correlation between anxiety and depression (Cuijpers et al.,2014; Saunders et al., 2019), trajectories of anxiety symptom change will also be explored as a secondary

outcome. In summary, this study aimed to examine: (1) the difference in the rate of change in depression and anxiety symptoms between ethnic groups; (2) the association between ethnic group and different trajectories along with other sociodemographic and treatment variables; (3) the association between different BAME groups and trajectory memberships.

Method

Data Source

The current study dataset comprises eight IAPT services belonging to the North and Central East London (NCEL) IAPT Service Improvement and Research Network (SIRN). The NCEL IAPT SIRN was established to use these routinely collected IAPT data to improve service delivery (Saunders et al., 2020), and approval for the use of the data for the current study was approved by network members. Data from 2011-2012 financial year (April to March) onwards were used, which contained 486,114 patients' episodes of care. This dataset contains routinely collected data from patients who received treatment in NCEL IAPT services; NHS ethical approval was not required for this study (confirmed by the Health Research Authority July 2020, reference number 81/81).

Services

IAPT services offer evidence-based interventions for depression and anxiety disorders organised in a stepped-care model (Clark et al., 2009). After consideration of initial suitability, each patient referred to the IAPT services was offered an assessment meeting with either a low- (LI) or high-intensity (HI) therapist. LI interventions are typically offered to patients with mild-to-moderate symptoms, while those with moderate-to-severe clinical presentations are more likely to receive HI interventions (National Collaborating Centre for Mental Health., 2018). LI interventions include supporting patients to apply self-help strategies based on CBT principles, usually for up to eight sessions. Patients who have not benefited from LI interventions may be "stepped up" to HI. HI sessions tend to be longer in the number of sessions and duration (50-60 minutes for HI intervention compared to 20-30 minutes of LI intervention, NHS Digital 2020). Following the method described in

Saunders et al. (2019), this research focused on patients who received HI psychological interventions due to the availability of more time-points (i.e., treatment sessions) than LI treatment, which allows a better exploration of the pattern of symptom change.

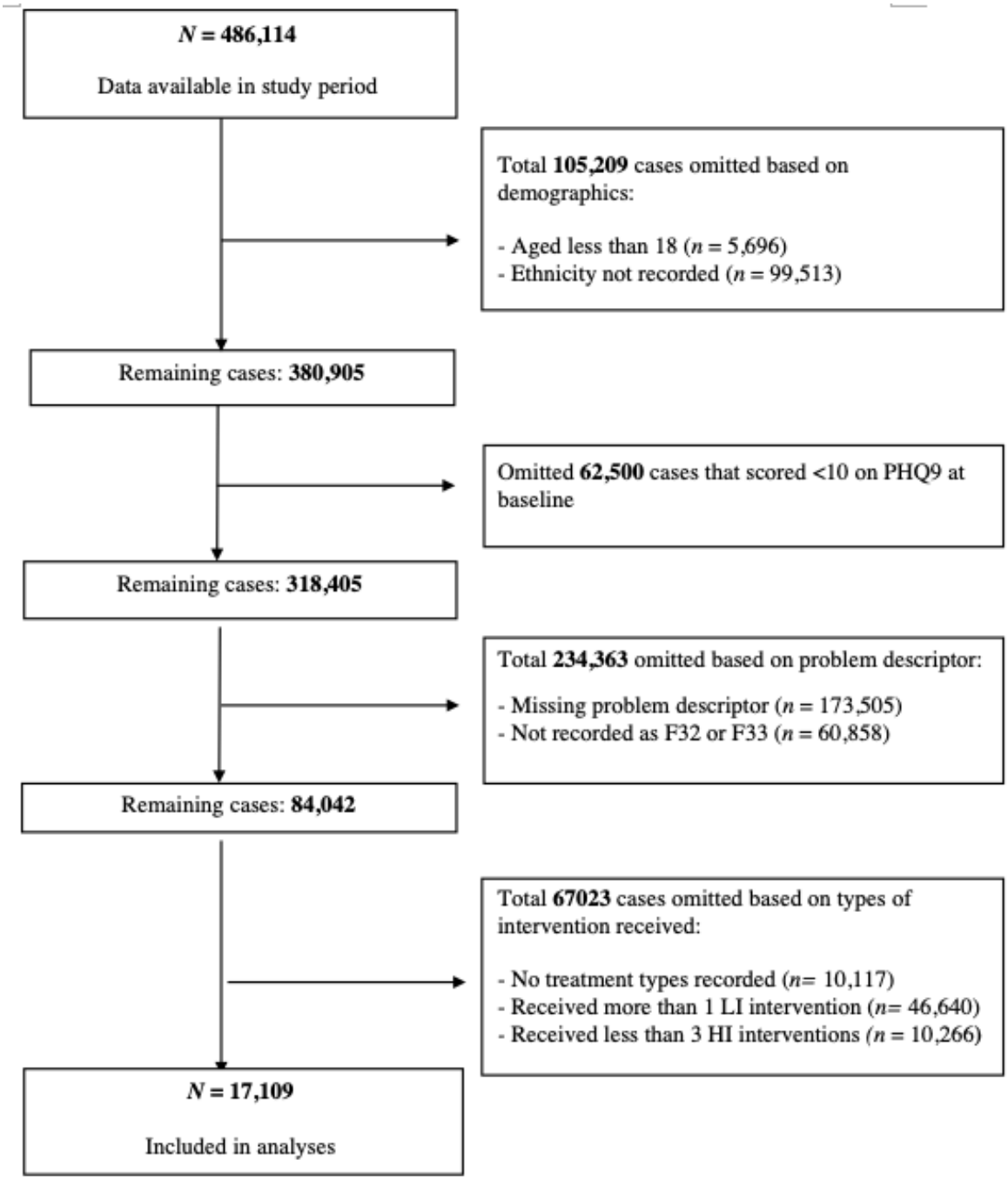
Patients

Patients were included in analyses if they met the following criteria: (1) aged 18 and above; (2) had a recorded ethnicity; (3) had a problem descriptor of "depressive episode"(F32) or "recurrent depression" (F33) based on International Classification of Disease-10 codes (World Health Organisation, 1992); (4) attended three or more HI intervention sessions; and (5) scored ⩾ 10 on the Patient Health Questionnaire 9-item version (PHQ-9; Kroenke et al., 2001) at assessment, as this is considered "caseness" for depression by IAPT services. Patients who attended one LI session at assessment then received HI sessions afterwards were included in the analyses as this first contact is typically an assessment session. Patients who completed treatment between 2008 and December 2020 were included in the analyses.

Patients were excluded from the analytic sample for the following reasons: (1) no data on ethnicity were available; (2) received fewer than three sessions of treatment, as a minimum of 3 time-points are required to model person-level symptom change; (3) still in treatment at the time of analysis (December 2020); (4) received more than one session of LI treatment (i.e., had additional LI intervention after the first assessment); and (4) scored less than 10 on PHQ-9 at initial assessment. Figure 1 illustrates the flow of patients excluded at each data cleaning stage, resulting in 17,109 patients included in the current study.

Figure 1

Flow of Patients Included in the Study



Measures

Primary Outcome

Patients completed all the routine outcome measures before every treatment appointment. The longitudinal change in depression symptoms was modelled using the PHQ-9, a nine-item screening tool to assess depressive symptoms (Kroenke et al., 2001). Each item is rated on a 4-point scale from 0 (not at all) to 3 (nearly every day), yielding a total depression severity score between 0 and 27. A cut-off score of 10 (i.e., "caseness") has been recommended for the detection of depressive symptoms and is used by IAPT services, with adequate sensitivity and specificity indicated for primary care populations (88%, Kroenke et al., 2001).

Secondary Outcome

Anxiety symptoms were measured using the seven-item Generalised Anxiety Disorder scale (GAD-7; Spitzer et al., 2006). Each item is rated from 0 (not at all) to 3 (nearly every day). Scores range from 0 to 21, with 0–10 indicating mild anxiety, 11–15 indicating moderate anxiety, and 15 or more indicating severe anxiety. A score of eight on the GAD-7 indicates a caseness score for generalised anxiety disorder in IAPT services (The National Collaborating Centre for Mental Health, 2018). The scale has good reliability ($\alpha = 0.92$) with adequate sensitivity (77%) and specificity (82%).

Variable Tested for Association with Treatment Outcome

Sociodemographic Variables

Individual characteristics were tested for their association with trajectories of treatment response. Variables of interest were socio-demographics (age at referral, gender, local area deprivation, employment status, presence or absence of a comorbid

physical health condition), clinical (baseline symptom severity, personal functioning, use of psychotropic medications concurrent to psychological therapy), and types of treatment received. All these variables were obtained from the IAPT dataset and are routinely collected by services.

Ethnicity

Patients who accessed the service were presented with a list of ethnic group categories standardised by the 2001 Census (Office for National Statistics; ONS, 2013). As the 2001 Census is standardised across the U.K., Hull et al., (2011) propose that this standardised categorical ethnicity measure will allow ease of comparison across services and studies. Details on how the categories were used for the current analyses are provided in the "Data Preparation" section.

Prescribed Medications and Therapy Type

Patients were asked if they were prescribed psychotropic medications at assessment. Information regarding types of treatment received and the number of treatment sessions was available in the dataset. CBT is the predominant HI approach for depression. Other types of HI treatments recommended in the NICE (2010) guidelines for depression are interpersonal therapy, behavioural couples therapy, behavioural activation, and counselling for depression**.**

Personal Functioning

The five-item Work and Social Adjustment Scale (WSAS; Mundt et al., 2002) measures the impact of low mood or anxiety on the ability to perform daily tasks in five domains (work, home management, social leisure activities, personal leisure

activities, and family and relationships). Each item is scored from 0 (not at all impaired) to 8 (severely impaired), producing a score between 0 and 40. A higher score suggests a lower level of functioning.

Local Area Deprivation

Local area deprivation was measured using the index of multiple deprivation (IMD; Smith et al., 2015) deciles. IMD measures the neighbourhood level of deprivation based on seven domains: unemployment, income, education, health and disability, crime, living environment, and barriers to housing or services. The IMD is split into deciles ranging from the most (1) to least (10) deprived areas in England, providing valuable information to compare deprivation between local neighbourhoods. More information on the methods used to generate the IMD can be found in McLennan et al. (2019).

Data Preparation

Clinical baseline scores (PHQ-9, GAD-7, WSAS), age, and IMD decile were treated as continuous variables. Individual socio-demographic variables (gender, employment, LTC conditions (LTCs), medication status, and types of treatment received) were dummy coded (see Appendix J for detailed list dummy-coded variables). Different ethnic groups were merged according to the ONS (2003)'s recommendation due to insufficient cases in each ethnic group to overcome inaccurate estimation of statistical parameters (Appendix K for complete breakdown of each ethnic group). Ethic groups were collapsed into: (1) White (White-British, White-Irish, and Other White background); (2) Mixed race (Mixed-White and Black Caribbean, Mixed White and Black African, Mixed White, and Asian, and any Other Mixed background); (3) Asian (Indian, Pakistani, Bangladeshi, and others); (4) Black

(including Caribbean, African, and Other Black); (5) Chinese; and (6) Other Ethnic groups.

Most patients received CBT (79%), whereas 16% received counselling and 5% received other HI interventions. For patients who received more than one type of treatment in an episode of care, the primary treatment type was recorded based on the type of treatment received more than 50% of the time. This allowed for a simple distinction of treatment received, and there were no individuals who received two interventions equally.

Data Analysis

Data and descriptive statistics were managed in SPSS v.25.0 (SPSS, Chicago, IL), and subsequent analyses were performed in MPlus v8.2 (Muthén & Muthén, 2017). Patients attended an average of 9.89 (*SD* = 4.47) sessions, including one pre-treatment assessment. While the number of sessions was slightly lower than an earlier study (*M* =10.9, *SD* = 4.31; e.g., Saunders et al., 2019), an upper limit of 13 sessions was used following Saunders et al. (2019) for comparison purposes. Missing data on outcome measures were handled with Full Information Maximum-Likelihood analysis in Mplus as per previous studies (Lutz et al., 2009; Saunders et al., 2019; Stulz et al., 2007; Stochl et al., 2021). Sociodemographic and clinical baseline variables with more than 5% missing cases were imputed using multiple imputations by chained equations (MICE) algorithm in SPSS then exported to Mplus. Variables with less than 5% missingness were not imputed as the impact of missingness was considered negligible (Jakobsen et al., 2017).

Analyses were carried out separately on the primary outcome measure (PHQ-9) and secondary outcome measure (GAD-7) in four stages: (1) identifying baseline latent growth model; (2) establishing an optimal number of trajectories in GMM models; (3) adding socio-economic and clinical variables to the identified GMM models to explore associations between predictors and trajectory membership; (4) conducting sensitivity analyses comparing models where missing data was imputed to the non-imputed models.

The average pattern of change in depression symptoms was estimated using latent growth curve (LGC) modelling. Single-group LCG models were analysed using linear and quadratic terms to determine the best fit for the data. The acceptability of a model was determined based on the following fit statistics: Comparative Fit Index (CFI), Tucker-Lewis Index (TFI), Root Mean Square of Error of Approximation (RMSEA), and the standardised root mean square residual (SRMR). CFI and TFI values of more than .90, SRMR values below.08 and RMSEA values less than .06 indicated a good model fit (Hu & Bentler, 1999) and were used as criteria for the current analysis.

Growth Mixture Model

GMM was then used to identify the optimal number of subgroups representing patients with similar symptom trajectories. The shape of the trajectory (linear or quadratic) was informed by the results of the LCG analysis. As GMM is an iterative process, the number of trajectory classes were specified starting from a 2-class model with an increasing number of classes until fit statistics began to worsen, demonstrating the model fitted the data less well than the model with one fewer trajectory class. Various fit statistics and a likelihood ratio test (LRT) determined the optimal number of latent classes. These included the Akaike Information Criterion (AIC;

Akaike, 1998), the Bayesian Information Criterion (BIC; Schwarz, 1978), sample size adjusted BIC (SABIC), entropy, Vuong-Lo-Mendell-Rubin LRT (VLMR-LRT; Lo et al., 2011) and Bootstrapped LRT (BLRT; McLachlan & Peel, 2000). A model with lower AIC, BIC and SABIC values indicate a better fitting model. Entropy values range from 0 to 1, with a higher value corresponds to increased accuracy of assigning patients to only one latent class (Wang & Jegelka., 2017). Both VLMR-LRT and BLRT compare the fit of a model with *K* classes with a model that had one fewer class (*K*-1) to evaluate the improvement in model fit. A non-significant *p*-value for the LMR and BLRT suggests that the model with one less class is a better fit. Lastly, the number of patients per trajectory was considered, and each class should contain at least 5% of the sample. Models with a small number of patients in each class have lower precision and may not be clinically meaningful (Wickrama et al., 2016).

Association of Other Variables and Trajectory Membership

The automated 3-step approach in Mplus (i.e., R3STEP command, Asparouhov & Muthén, 2014) was used to investigate the association between sociodemographic characteristics, treatment variables and trajectory class membership. Two independent models were performed, each for PHQ-9 and GAD-7. The R3STEP procedure first estimates the GMM using depression symptoms across 13-time points without predictors. In step two, a most likely class variable (i.e., latent class membership) is created based on the posterior probabilities obtained in the prior step (Vermunt, 2010). The third step is a multinomial logistic regression that uses the latent class variable identified in step two as the dependent variable and adds predictors into the model while adjusting for classification uncertainty. Class memberships will be fixed whenever a predictor is entered into a model to ensure a stable class solution. Hence, R3STEP results in a less biased parameter estimate than the 1-step (joint model

estimation) approach. The one-step approach uses a joint model that combines the latent class model with a latent class regression model such that the latent classes are condition on the covariates (Asparouhov & Muthén, 2014). This would mean the inclusion of covariates may affect the type of classes found and class membership. Furthermore, both the latent class and the latent class regression models need to be re-estimated each time a covariate is added, which is impractical in exploratory studies with many covariates (Vermunt, 2010). Therefore, the 3-strep approach is chosen to independently evaluate the association between latent classes and baseline covariates without changing class membership.

The limitation of R3STEP is that it employs listwise deletion to address missingness in predictors (Asparouhov & Muthén, 2014), as it is a newly developed method of analysis and is still in the development phase. Sensitivity analyses were conducted to ascertain the robustness of findings from complete case analysis (i.e., non-imputed models) compared to imputed models.

Results

The result section is divided into two parts. The first part focuses on describing sample characteristics, identifying GMM model, and depression symptom trajectories before presenting the research findings.

Sample Characteristics

Table 1 and 2 present descriptive statistics of patients stratified by ethnic groups. Among the 17,109 patients included in the current study, 70% were women, and the mean age was 39.16 years (*SD* = 13.61). 63% of the patients were from a White ethnic background (*n* = 10,795), followed by Asian (13%, *n* = 2296), Black (12%, *n*= 2055), Mixed (7%, *n* = 1153), Other (4%, *n*= 710) and Chinese (1%, *n* = 97) patients. 58% of the sample were employed, 45% were prescribed psychotropic medications, and 28% reported having a long-term condition (LTCs). Across ethnic groups, more women than men received treatment for depression. Patients of Black and Mixed-heritage backgrounds appeared to reside in more deprived areas (Table 2) than other ethnicities.

Baseline Descriptive Statistics

Sample characteristics and test-statistics for White compared to BAME groups are available in Appendix L. There were significant differences between the BAME and White patients on the following variables: age (White patients were older), gender (more BAME patients were female), employment status (more White patients were employed), prescribed medications (more White patients were prescribed medication), deprivation (BAME patients lived in more deprived areas on average), and baseline PHQ-9 and GAD-7 scores (BAME patients scored higher on both on average). No significant associations were observed between BAME and White patients for: recipient of CBT, LTCs, or baseline WSAS scores.

Table 1
Count and Percentages for Categorical Demographic

	Full sample	Asian	Black	Chinese	Mixed	Other	White
				Count (%)			
Gender (female)	11891 (70)	1544 (67)	1551 (76)	13 (75)	849 (74)	521 (73)	7535 (68)
Employed	9848 (58)	1134 (49)	1019 (50)	52 (54)	670 (58)	286 (40)	6687 (62)
Prescribed medications	7736 (45)	988 (43)	169 (37)	67 (69)	606 (53)	335 (47)	5159 (48)
LTCs	4774 (28)	669 (29)	577 (28)	17 (18)	269 (23)	212 (30)	3029 (28)
CBT	13468 (79)	1867 (81)	1634 (80)	81 (84)	916 (79)	523 (74)	8447 (78)
Counselling	2863 (17)	316 (14)	329 (16)	13 (13)	181 (16)	158 (22)	1866 (17)

Note. LTCs = long term physical health condition; CBT= Cognitive Behaviour Therapy.

Table 2

Mean and Standard Deviation for Continuous Variables

	Full sample	Asian	Black	Chinese	Mixed	Other	White
				Mean (SD)			
Age	39.16 (13.62)	37.19 (12.62)	37.68 (12.78)	33.99 (12.20)	35.52 (11.42)	40.20 (12.95)	40.34 (10.04)
IMD	4.10 (2.21)	4.45 (2.04)	3.42 (1.97)	4.74 (2.15)	3.88 (2.08)	4.11 (2.19)	4.19 (2.30)
Baseline WSAS	21.76 (8.71)	22.46 (8.95)	22.25 (8.89)	20.89 (7.81)	21.90 (8.57)	21.89 (9.51)	21.50 (8.59)
Baseline PHQ-9	17.88 (4.52)	18.52 (4.50)	18.14(2.43)	16.86 (4.73)	17.55 (4.40)	18.65 (4.5)	17.70 (4.53)
Baseline GAD-7	14.58 (4.54)	15.43 (4.36)	14.70 (4.43)	16.86 (4.74)	14.23 (5.58)	15.43 (4.37)	14.36 (4.53)
Session number	9.89 (4.47)	9.41 (4.20)	9.75 (4.48)	9.37 (4.01)	9.88 (4.46)	9.33 (4.07)	10 (4.55)

Identifying Baseline Model

LCG analysis was used to identify the best fitting model for PHQ-9 and GAD-7. The latent quadratic growth models provided a superior fit compared to other models (Table 3). Higher CFI and TFI values and lower SRMR and RMSEA values were observed for the quadratic model; therefore, it was chosen for subsequent analyses. Earlier studies (Saunders et al., 2019; Stochl et al., 2021) have similarly found that a quadratic function provides the best fit for data using naturalistic outpatient samples. Figure 2 depicts the mean trajectories for PHQ-9 and GAD-7. The average baseline scores were 17.56 and 14.58 for PHQ-9 and GAD-7, respectively. The entire sample growth model reflected an overall decrease in symptom severity as

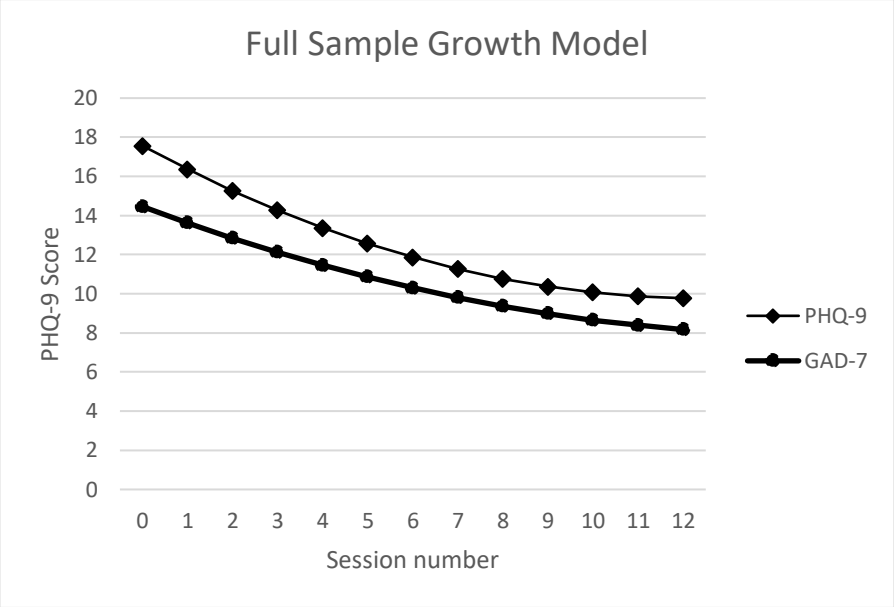
the number of sessions increased, with most change earlier in treatment (Figure 2, see Appendix M for full sample growth parameter estimates).

Table 3
Comparisons of Latent Growth Curve Model

	PHQ-9				GAD-7			
Mode	CFI	TLI	RMSEA	SRMR	CFI	TLI	RMSEA	SRMR
Intercept	.446	.515	.186	.382	.529	.588	.170	.268
Linear	.863	.876	.094	.202	.900	.910	.080	.155
Quadratic	**.936**	**.939**	**.066**	**.075**	**.953**	**.955**	**.056**	**.055**

Note. Bold values indicate better model fit

Figure 2
Full Sample Growth Model for PHQ-9 and GAD-7



Identification of Depressive Symptom Trajectories

Based on the model fit indices, a 3-class solution (i.e., three subgroups of patients) was selected as the best fitting model. The AIC, BIC and SABIC decreased from the 2- to 3-class model (Table 4); a significant VLMR and BLRT test indicated that model fit for the 3-class solution was better than a 2-class solution. Although AIC,

BIC, SABIC, and entropy values were better (i.e., lower) in the 4-class model, the BLRT test did not significantly differ between the 4-and 3-class solutions. Furthermore, the 4-class model included one subgroup with only 1.5% of the sample, which may have been underpowered in detecting differences between ethnic groups (Nylund et al., 2007).

Table 4
Model Fit Indices for PHQ-9

	Class 2	**Class 3**	Class 4	Class 5
AIC	865741	**865043**	864690	864425
BIC	865943	**865276**	864953	864719
SABIC	865860	**865180**	864845	864598
Entropy	0.62	**0.57**	0.65	0.64
Patients in each class (%)	27-73	**26-54-19**	50-22-26-1.5	11-28-54-5-1.4
VLMR *(p)*	<.001	**<.001**	.009	.001
BLRT *(p)*	<.001	**<.001**	1.00	1.00

Note. AIC: Akaike information criteria; BIC: Bayesian information criteria; SABIC: Sample size adjusted BIC; VLMR-LR: Vuong-Lo-Mendell-Rubin likelihood ratio test; Bootstrap-LR: Bootstrapped likelihood ratio test. Bold indicates the model chosen for further analyses.

Class Interpretation for PHQ-9. Table 5 presents the growth means and confidence intervals for the 3-class model, while Figure 3 provides a visualisation of latent classes across treatment. Descriptive statistics of each trajectory are available in Appendix N. Class 1 (Non-responders) represents 27% (n = 4536) of the sample who reported depressive symptoms at assessment that were within the severe category of the PHQ-9 (M = 20.958) and demonstrated minimal symptom reduction (M = -0.578) throughout treatment. Class 2 (High-severity Responders) was composed of 19% (n =

3319) of the sample who displayed severe depressive symptoms at assessment (*M* = 20.965) and experienced a rapid decrease in depressive symptoms during treatment (*M* = -2.154). Patients in this class continued to respond to treatment and ended treatment within the mild range of depressive symptoms (i.e., below cut-off scores for depression). Class 3 (Moderate-severity Responders) accounted for most of the sample (54%, *n* = 9241), characterised by patients who had PHQ-9 scores at assessment in the moderate range (*M* = 14.366) and responded to treatment (*M* = -1.217) for seven sessions before the rate of change plateaued (Figure 3).

Table 5

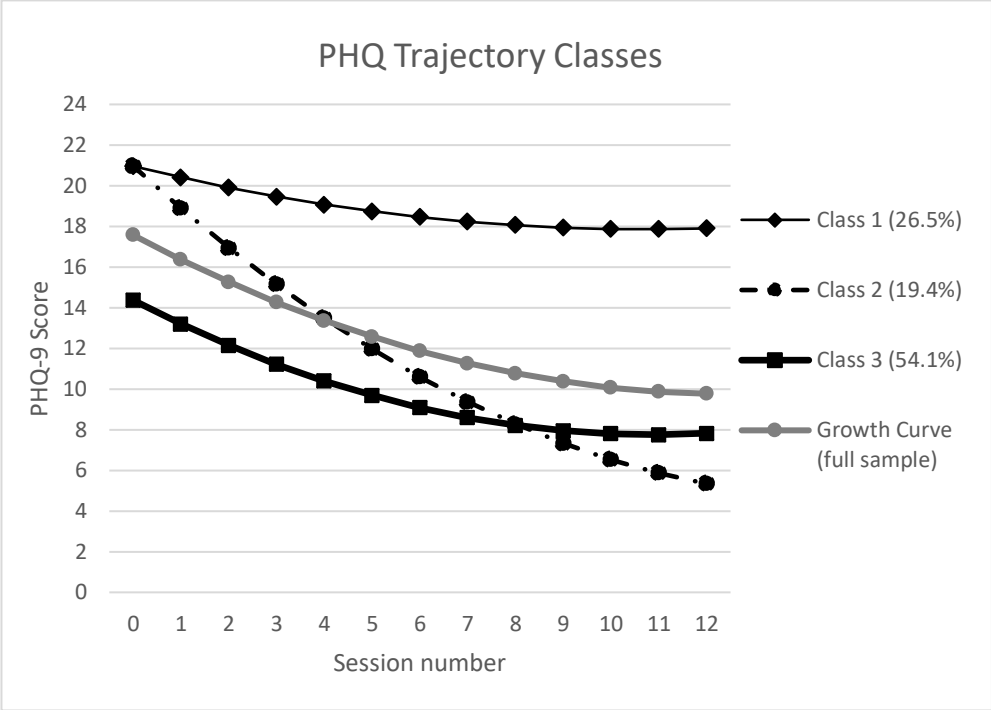
Means and 95% Confident Intervals for PHQ-9

	Intercept		Slope		Quadratic	
Class	Mean	95% CI	Mean	95% CI	Mean	95% CI
1	20.958	20.801, 21.145	-0.578	-0.636, -0.509	0.027	0.022, 0.032
2	20.965	20.791, 21.172	-2.154	-2.322, -1.986	0.071	0.056, 0.087
3	14.366	14.241, 14.490	-1.217	-1.292, -1.141	0.056	0.049, 0.062

Note. All estimates were statistically significant ($p < .001$). Class 1= Non-responders; Class 2 = High-severity Responders; Class 3 = Moderate-severity Responders

Figure 3

Trajectories of Depressive Symptoms



Note. Class 1= Non-responders; Class 2 = High-severity Responders; Class 3 = Moderate-severity Responders

Identification of Anxiety Symptom Trajectories

For the secondary analysis using the GAD-7, the 4-class model fit to the data better than a 3-class model as the AIC, BIC, and SABIC decreased from the 3-to 4-classes. The VLMR and BLRT tests were significant, suggesting the 4-class solution compared to the 3-class solution was a better fit (Table 6). Although AIC, BIC, and SABIC values continued to decrease after the 4-class model, a non-significant BLRT statistic for the 5-class solution suggested minimal improvement in model fit. As the most parsimonious model has fewer classes, it is recommended in such circumstances to select such a model (Nylund et al., 2007). Hence the 4-class model was chosen.

Table 6
Model Fit Indices for GAD-7

	Class 2	Class 3	**Class 4**	Class 5	Class 6
AIC	832492	831432	**830841**	830524	830183
BIC	832693	831665	**831104**	830818	830509
SABIC	83261	831569	**830996**	830697	830375
Entropy	0.59	0.56	**0.56**	0.57	0.60
Patients in each class	33-67	32-33-34	**11-34-31-19**	20-26-19-14- 21	7-18-2-28-20-22
VLMR LRT *(p)*	<.001	<.001	**<.001**	<.001	>.05
Bootstrap LRT*(p)*	<.001	<0.05	**<.001**	>.05	>.05

Note. AIC: Akaike information criteria; BIC: Bayesian information criteria; SABIC: Sample size adjusted BIC; VLMR-LR: Vuong-Lo-Mendell-Rubin likelihood ratio test; Bootstrap-LR: Bootstrapped likelihood ratio test. Bold indicates the model chosen for further analyses.

Class Interpretation for GAD-7

Figure 4 displays the final model for GAD-7, and the growth means are presented in Table 7. Descriptive statistics for each trajectory class are available in Appendix O. Class 1 (Non-responders; *n* = 6022, 35%), the largest class, characterised by consistently high levels of generalised anxiety symptoms across time. Patients in this group began treatment within the severe range of anxiety symptoms (*M* = 16.802; Figure 4) and demonstrated minimal symptom change over time (*M* = -0.189). Class 2 (High-severity-Slow Responders; *n* = 1939, 11%) included patients who had severe anxiety symptoms (*M* = 16.74) at assessment followed by a slow initial response to treatment (*M* = -0.377). Despite exhibiting a slower initial treatment response, patients in this trajectory responded to treatment by the fourth session and ended treatment with minimal anxiety symptoms. Class 3 (High-severity Responders, *n* = 3290, 19.2%) represented patients who experienced severe anxiety symptoms at assessment (*M*=

16.304) followed by rapid symptom reduction after starting treatment (*M*= -2.562). Although anxiety symptoms increased after session nine, patients in the High-severity Responders class ended treatment in the mild anxiety symptom range. Class 4 (Moderate-severity Responders; 34%, *n* = 5842) was distinguished from other classes for having the lowest GAD-7 scores at assessment (moderate range, *M* = 9.889) and consisted of patients who experienced early initial response to treatment that plateaued over time (Figure 4).

In summary, Class 1 (Non-responders) of both PHQ-9 and GAD-7 trajectories represented a subgroup of patients who had persistently severe symptoms. Class 2 (High-severity Responders of PHQ-9) and Class 3 (High-severity Responders) of GAD-7 consisted of patients who began treatment with severe symptoms yet experienced a sharp reduction in symptomatology following the initiation of treatment. Class 3 of PHQ-9 (Moderate-Severity Responders) and Class 4 of GAD-7 (Moderate-severity Responders) consisted of patients who started treatment with the lowest symptom severity and responded to treatment.

Table 7

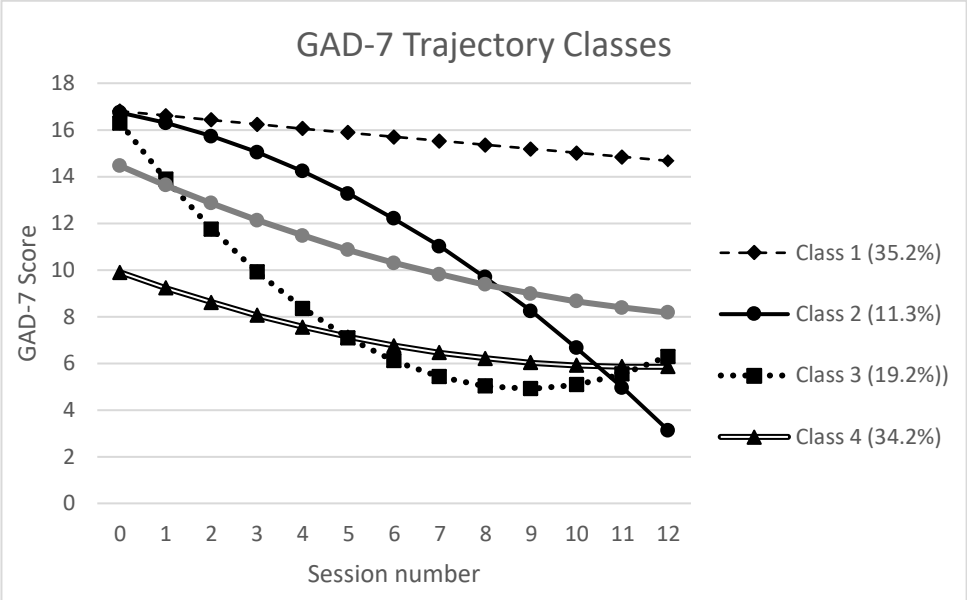
Means and 95% Confident Intervals for GAD-7 Model

	Intercept		Linear		Quadratic	
	Mean	95% CI	Mean	95% CI	Mean	95% CI
Class 1	16.80	16.69 to 16.92	-0.19	-0.23 to -0.15	0.001	-0.003 to 0.005
Class 2	16.74	16.52 to 16.96	-0.39	-0.51 to -0.24	-0.063	-0.08 to -0.05
Class 3	16.30	16.05 to 16.55	-2.56	-2.68 to -2.44	0.144	0.13 to 0.16
Class 4	9.90	9.73 to 10.10	-0.71	-0.77 to -0.64	0.031	0.03 to 0.04

Note. All estimates were statistically significant *(p*< .001).

Figure 4

Trajectories of Anxiety Symptoms



Note. Class 1 = Non-responders; Class 2 = High-severity-Slow Responders; Class 3= High-severity Responders; Class 4= Moderate-severity Responders.

Research Question One: Do the rates of change for depression and anxiety symptoms vary between BAME and White populations?

Linear growth model regressions were conducted by adding ethnicity (BAME= 0, White= 1) as an independent variable. A significant association between ethnicity and baseline PHQ-9 and GAD-7 scores was found, suggesting that White patients had lower depressive and anxiety symptoms than BAME patients at assessment (i.e., negative intercept values; Table 8). Additionally, there were significant differences between ethnic groups in the rate of change for PHQ-9 (b = 0.04; CIs: 0.02, 0.06), as well as GAD-7 (b = 0.03; CIs: .013,.005). These findings indicated that there was ethnic variation in treatment responses across time.

Table 8

Ethnicity and Full Sample Linear Growth Trajectory

		Unstandardised B	95% CI	*p*
Ethnicity and linear latent growth				
PHQ-9	Intercept	-0.78	-0.91 to -0.65	<.0001
	Slope	0.04	0.02 to 0.06	.002
GAD-7	Intercept	-0.82	-0.94 to -0.70	<.001
	Slope	0.031	0.013 to 0.050	.006

Research Question Two: Are ethnicity, sociodemographic and treatment variables associated with the identified trajectory classes?

The R3STEP procedure removed cases that had missing socio-demographic or treatment variables via listwise deletion, resulting in a total of 13708 patients (80% of initial sample) for the following analyses.

Associations between Ethnic Groups and Depressive Symptom Trajectories

Class 3 (Moderate-severity Responders) served as a reference group for PHQ-9 as it had the largest sample size. Preliminary analysis using ethnicity as a binary variable indicated there were ethnic differences in depression trajectories. White patients had lower odds of belonging to the Non-responders class *(OR* = 0.871; CI: 0.752,1.008, *p* = .009) and High-severity Responders class (*OR* = 0.691; CI: 0.593,0.807, *p* <.001) than BAME patients (Appendix Q, Table Q.1).

Further investigation was conducted to ascertain if different ethnic groups had different association with depression trajectories. Dummy variables predicting treatment response trajectories were included for Black, Asian, Mixed, Chinese, and Other ethnic groups. White ethnicity was chosen as the reference group. Results are presented in Table 9.

Variation between ethnicity groups was observed between Asian and White patients after controlling for sociodemographic and treatment variables. Asians had 40.7% higher odds belonging to the Non-responders (*OR* = 1.407; CI: 1.170-1.693, *p* = .01) and 36.9% higher odds of being a member of the High-severity Responders class (*OR*= 1.369, CI: 1.147,1.700, *p* = .016). There was no statistical difference in the likelihood of belonging to Non-responders or High-severity Responders trajectories between White patients and Black, Chinese, Mixed-heritage or Other ethnic groups (Table 9).

Associations between Other Variables and Depressive Symptom Trajectories

Gender, employment status, medication status, baseline GAD-7 score and IMD were all significantly associated with Non-and High-severity Responders trajectories. Women had lower odds of belonging to the Non-responders (*OR* = 0.801; CI: 0.696, 0.922, *p* .012) and High-severity Responder classes (*OR* = 0.834; CI: 1.147,1.700, *p* =

.016) compared to men. Employed patients were less likely to be in the Non-responders (*OR*= 0.255; CI: 0.223,0.29, $p < .001$) and High-severity Responders classes (*OR* = 0.673; CI: 0. 0.580,0.780, $p < .001$). Patients who were prescribed medications were more likely to be in the Non-responders (*OR* = 2.480; CI: 2.175,2.829, $p < .001$) and High-severity Responders classes (*OR* = 1.933; CI: 1.675,2.232, $p < .001$). Those who had higher baseline GAD-7 scores were more likely to be in the Non-responders (*OR* = 1.577; CI: 1.536,1.62, $p < .001$) and High-severity Responders classes (*OR* =1.546; CI: 1.506,1.586, $p < .001$). Patients who lived in deprived areas were more likely to belong to the Non-responders (*OR* =0.904; CI:0.878,0.932, $p < .001$) and High-severity Responders classes (*OR* = 0.897; CI: 0.868,0.926, $p < .001$).

The following variables were associated with treatment Non-responders class: age (*OR* = 1.008; CI: 1.003,1.013, $p = .005$), LTCs (*OR* = 1.524; CI: 1.136,1.765, $p < .001$), CBT (*OR* = 0.611; CI: 0.426,0.876, $p = .004$) and counselling (*OR*= 0.626; CI: 0.428,0.917, $p = .01$). Patients who were prescribed psychotropic medications at assessment were twice as likely to be in the Non-responders class than those not prescribed psychotropic medication. Those who received either CBT or counselling were less likely to belong to the Non-responders class than those in receipt of other HI interventions. Lastly, the age of the participant was associated with a greater likelihood of belonging to the Non-responders class, with an approximate 1% increase in odds for each year increase at baseline relative to the Moderate-Severity responders class. Baseline WSAS score was not associated with class membership.

Table 9
Baseline Characteristics and PHQ-9 Trajectories (N= 13708)

	Class 1 Non-responders			Class 2 High-severity Responders		
	OR	*p*	95% CIs	OR	*p*	95% CIs
Reference: White						
Mixed	0.971	.837	0.765-1.232	1.105	.505	0.857-1.426
Black	0.968	.792	0.791,1.186	0.997	.905	0.796,2.034
Other	1.513	.054	1.148,1.996	1.489	.075	1.090,2.034
Chinese	1.292	.669	0.541,3.087	0.894	.143	0.321,2.492
Asian	**1.407**	**.010**	**1.170,1.693**	**1.369**	**.016**	**1.147,1.700**
Women (vs men)	**0.801**	**.004**	**0.696,0.922**	**0.834**	**.013**	**0.715,0.973**
Employed (vs not)	**0.255**	**<.001**	**0.223,0.292**	**0.673**	**<.001**	**0.580,0.780**
Prescribed medication (vs not)	**2.480**	**<.001**	**2.175,2.829**	**1.933**	**<.001**	**1.675,2.232**
LTCs (vs not)	**1.524**	**<.001**	**1.136,1.765**	**1.157**	**<.001**	0.981,1.364
CBT (vs other HI)	**0.611**	**.004**	**0.426, 0.876**	1.1	.850	0.810,1.710
Counsel (vs other HI)	**0.626**	**0.01**	**0.428, 0.917**	0.793	.164	0.530,1.187
Age	**1.008**	**.005**	**1.003,1.013**	1.005	.156	0.999,1.010
Baseline GAD-7	**1.577**	**<.001**	**1.536,1.620**	**1.546**	**<.001**	**1.506,1.586**
Baseline WSAS	1.005	.275	0.998,1.012	1.003	.681	0.995,1.011
IMD	**0.904**	**<.001**	**0.878,0.932**	**0.897**	**<.001**	**0.868,0.926**

Associations between Ethnic Groups and Anxiety Symptom Trajectories

Table 10 shows the likelihood of belonging to Non-responders, High-severity Responders, and High-severity-Slow Responders classes relative to Moderate-severity Responders class. Using ethnicity as a binary variable, preliminary analysis indicated that relative to BAME patients, White patients were less likely to belong to the Non-responders (*OR* = 0.834; CI: 0.722-0.963, *p* =.02*)*, High-severity-Slow Responders (*OR* = 0.549; CI: 0.46-0.66, *p <.001*) and Early responders (*OR* = 0.835; CI: 0.709-0.985, *p* = .048) classes.

When compared to White patients, Asian patients were more likely to belong to the Non-responders (*OR* 1.523; CI*:* .253, 1.853, *p* = .004), and twice as likely to be in the High-severity-Slow Responders class (*OR* =2.152; CI*:* 1.727, 2.653, *p* <.001) than Moderate-severity Responders class. Similarly, Other Ethnic groups had increased odds of being associated with Non-responders (*OR* = 1.797; CI:1.297, 2.490, *p* = .025) and High-severity-Slow Responders class (*OR* = 2.319; CI:1.568, 3.431, *p* =. 017). In contrast, Mixed-heritage, Black, Chinese and Other ethnicities were not associated with any trajectories relative to the Moderate-severity responders class. There were no ethnic differences in the likelihood of belonging to High-severity Responders relative to Moderate-severity Responders class.

Associations between Other Variables and Anxiety Symptom Trajectories

Being employed (compared to unemployed) was associated with lower odds of belonging to either the Non-responders *(OR* = 0.336; CI: 0.290, 0.388, *p* <.001) or High-severity-Slow Responder classes (*OR* = 0.729; CI: 0.606, 0.876, *p* =.001). Individual attributes that were associated with a higher probability of belonging to the Non-responders class were: being prescribed psychotropic medication(s) (*OR* = 1.235; CI: 0.290, 0.388, *p* = .026); age (with each one year increase associated with slightly higher odds of belonging to this class; *OR* = 1.007; CI: 1.002, 1.012, *p* =.032), and having an LTCs (*OR* = 1.245; CI: 1.066, 1.454, *p* = .044). Higher baseline PHQ-9 scores were associated with greater odds of membership to trajectory classes that had greater baseline anxiety symptoms (Table 10) than the Moderate-severity Responders class.

Table 10

Baseline Characteristics and GAD-7 Trajectories (N= 13708)

	Class 1 Non-responders			Class 2 High-severity-Slow Responders			Class 3 High-severity Responders		
	OR	95% CIs	*p*	*OR*	95% CIs	*p*	*OR*	95% CIs	*p*
Mixed	0.891	0.691, 1.149	.430	1.106	0.801, 1.526	.625	1.027	0.758, 1.393	.885
Black	1.157	0.928, 1.443	.311	1.188	0.911, 1.550	.326	1.261	0.989, 1.608	.161
Other	**1.797**	**1.297, 2.490**	**.025**	**2.319**	**1.568, 3.431**	**.017**	1.161	0.744, 1.814	.608
Chinese	0.913	0.310, 2.688	.885	0.4580	0.089, 2.594	.291	0.552	0.169, 1.804	.260
Asian	**1.523**	**1.253, 1.853**	**.004**	**2.152**	**1.727, 2.653**	**<.001**	1.197	0.953,1.503	.235
Women (vs men)	1.171	1.010, 1.358	.104	1.115	0.926, 1.343	.361	1.090	0.921, 1.291	.420
Employed (vs not)	**0.336**	**0.290, 0.388**	**<.001**	**0.729**	**0.606, 0.876**	**.001**	1.059	0.890, 1.261	.597
Prescribed medication (vs not)	**1.235**	**1.073, 1.423**	**.026**	0.951	0.796, 1.136	.632	0.842	0.716, 0.991	.059
Long-term condition (vs not)	**1.245**	**1.066, 1.454**	**.037**	**1.214**	**1.002, 1.470**	**.130**	0.935	0.774, 1.128	.541
CBT (vs other HI)	.1169	0.848, 1.610	.459	1.767	1.117, 2.796	.119	1.358	0.930, 1.982	.252
Counsel (vs other HI)	0.994	0.707, 1.398	.977	0.938	0.571, 1.543	.828	0.786	0.523, 1.181	.271
Age	**1.007**	**1.002, 1.012**	**.032**	1.005	0.999, 1.011	.209	1.001	0.995, 1.008	.732
WSAS	**1.529**	**1.491, 1.562**	**<.001**	**1.453**	**1.416, 1.491**	**<.001**	**1.399**	**1.369, 1.429**	**<.001**
Baseline PHQ-9	**1.007**	**0.999, 1.015**	**.176**	**1.004**	**0.993, 1.014**	**.552**	**1.011**	**1.002, 1.021**	**.046**
IMD	0.974	0.944, 1.005	.156	0.988	0.949, 1.028	.606	1.016	0.981, 1.052	.463

Note. Class 3 (Moderate-severity Responders) serves as the reference class; Reference group= White*; OR*= odds ratios; *CI*= Confidence intervals

Research Question Three: Are there ethnic variation between the BAME Group In Relation To Depressive and Anxiety Symptom Trajectories?

Analyses were conducted to examine differences in depressive and anxiety symptom trajectories among BAME populations, while holding pre-treatment characteristics as covariates. Stratified analysis was conducted by excluding White patients, resulting in 4768 BAME patients (Table 11). Black ethnicity was used as the reference ethnic group as it has the largest number of patients, while Moderate-severity Responders served as the reference class for all analyses.

Compared to the Black ethnicity group, Chinese patients had 86% lower odds of being in the High-severity Responders than the Moderate-severity Responders depression class (*OR* = 0.144; CI: 0.010, 2.079, p< .001). Asian patients were marginally more likely than Black patients to belong to the Non-responders class (*OR* = 1.471; CI: 1.117, 1.937, *p*= 0.46). Mixed and Other ethnicities were not significantly associated with class membership relative to Moderate-severity Responder class (Table 11).

For anxiety trajectories, Other ethnic groups and Asians were more likely to belong to Non-responders and High-severity-Slow Responders class (Table 12). Patients who had Other ethnic identity were twice as likely to belong to the Non-responders (*OR* = 2.064; CI: 1.401, 3.040, *p* = .028), and twice as likely to be in the High-severity-Slow Responder class (*OR* = 2.188; CI: 1.394, 3.434, *p* = .048) than Moderate-severity Responders class. Similarly, Asian patients were more likely to be in the Non-responders (*OR* =1.524; CI: 1.182,1.965, *p*= .026) and twice as likely to be in the High-severity-Slow Responders (*OR*= 1.662; CI: 1.230, 2.245, *p* =.029) than Moderate-severity Responder class.

Table 11

Associations Between Ethnicities and PHQ-9 Trajectory, Stratified by BAME Populations (N= 4768)

	Class 1 Non-responder			Class 2 Early responder		
	OR	95% CIs	*p*	*OR*	95% CIs	*p*
Reference: Black						
Mixed	0.946	0.615-1.455	.826	0.713	0.459-1.109	.134
Other	1.659	1.139-2.417	.082	1.217	0.813-1.822	.468
Chinese	2.145	0.829-5.550	.356	**0.144**	**0.010-2.079**	**<.001**
Asian	**1.471**	**1.117-1.937**	**.046**	1.111	0.847-1.458	.544
Women (vs men)	0.852	0.652-1.114	.287	**0.752**	**0.573-0.987**	**.046**
Employed (vs not)	**0.332**	**0.258-0.428**	**<.001**	0.809	0.629-1.041	.124
Prescribed medication (vs not)	**3.318**	**2.585-4.258**	**<.001**	**2.599**	**2.015-3.352**	**<.001**
Long-term condition (vs not)	**1.535**	**1.167-2.019**	**.036**	1.441	1.095-1.895	.066
CBT (vs other HI)	**0.442**	**0.254-0.770**	**<.001**	0.740	0.432-1.266	.282
Counsel (vs other HI)	**0.501**	**0.277-0.907**	**.006**	0.650	0.361-1.172	.133
Age	1.012	**1.002-1.023**	.047	1.007	0.997-1.018	.231
Baseline GAD-7	**1.632**	**1.547-1.722**	**<.001**	**1.546**	**1.480-1.614**	**<.001**
Baseline WSAS	0.994	0.981-1.008	.493	0.995	0.981-1.009	**.535**
IMD	**0.911**	**0.857-0.967**	**.007**	0.947	0.891-1.007	.132

Note. Class 3 (Moderate-severity Responders) serves as the reference class. Black = reference group. OR= odds ratios; CI= Confidence intervals.

Table 12

Association between Ethnicities and GAD-7 Trajectories, Stratified by BAME Populations (N= 4785)

	Class 1 Non-responders			Class 2 igh-severity-Slow Responders			Class 3 High-severity Responders		
	OR	95% CIs	*p*	*OR*	95% CIs	*p*	OR	95% CIs	*p*
Mixed	0.884	0.585-1.336	.602	0.827	0.476-1.437	.534	0.865	0.521-1.474	.612
Other	**2.064**	**1.401-3.040**	**.028**	**2.188**	**1.394-3.434**	**.048**	1.041	0.617-1.757	.902
Chinese	1.234	0.398-3.826	.783	0.332	0.030-3.653	.167	0.595	0.173-2.040	.363
Asian	**1.524**	**1.182-1.965**	**.026**	**1.662**	**1.230-2.245**	**.029**	1.058	0.797-1.405	.749
Women (vs men)	1.266	0.973-1.647	.189	1.122	0.826-1.523	.559	1.041	0.768-1.411	.832
Employed (vs not)	**0.371**	**0.290-0.473**	**<.001**	0.794	0.596-1.057	.136	0.962	0.723-1.280	.819
Prescribed medication (vs not)	1.303	1.023-1.658	.113	1.085	0.814-1.446	.655	0.835	0.626-1.115	.261
Long-term condition (vs not)	1.202	0.917-1.577	.307	1.385	1.022-1.876	.133	0.873	0.625-1.219	.473
CBT (vs other HI)	0.945	0.558-1.601	.856	1.147	0.610-2.156	.739	0.992	0.525-1.876	.984
Counsel (vs other HI)	0.842	0.478-1.482	.585	0.847	0.424-1.693	.669	0.633	0.316-1.266	.169
Age	**1.016**	**1.006-1.026**	**.009**	**1.015**	**1.004-1.026**	**.032**	1.010	0.998-1.022	.167
Baseline WSAS	1.011	1.006-1.025	.220	1.010	0.994-1.027	.293	1.005	0.988-1.021	.656
Baseline PHQ-9	**1.535**	**1.480-1.592**	**<.001**	**1.457**	**1.397-1.519**	**<.001**	**1.385**	**1.338-1.435**	**<.001**
IMD	0.981	0.927-1.038	.565	0.970	0.908-1.037	.445	1.006	0.942-1.075	.872

Note. Class 3 (Moderate-severity Responders) serves as the reference class. Black = reference group. OR= odds ratios; CI= Confidence intervals

Sensitivity Analyses

As the R3STEP procedure removed cases that had missing data via listwise deletion, sensitivity analyses were conducted to ascertain the robustness of findings by adjusting for missing data. Fifty datasets were imputed using the MICE algorithm in SPSS for IMD to account for the high proportion of missingness (n = 2357, 14%). The 50 datasets were pooled using Rubin's rules (Rubin, 1987) into a single set of results, which were calculated by accounting for the uncertainty of the imputation within a dataset (i.e., differences in predicted values from the observed values in the original dataset) and the imputation variance (e.g., differences between multiple datasets). The final pooled dataset was imported back into Mplus for sensitivity analyses.

The findings were observed to be consistent with complete case analysis (i.e., non-imputed model): sociodemographic characteristics (gender, employment status, IMD) and treatment variables (medication status, LTCs, CBT, counselling, baseline GAD-7 scores) were associated with depression trajectories with higher symptom severity. White patients had lower odds of being a member of the Non-responders and Early Responder trajectory classes when compared to BAME patients after adjusting for IMD. Similarly, ethnic differences in depressive symptom change persisted between White and Asian patients after adjusting for IMD. Unlike complete case analysis (i.e., non-imputed model), there was no ethnic variation when other ethnicities were compared to Black patients, suggesting that IMD accounted for differences between different BAME groups and Black patients (Appendix R, Table R.3).

For anxiety, White patients had lower odds of belonging to trajectories with higher symptom severity than BAME patients; findings for pre-treatment variables were consistent with complete-case analysis. Consistent with complete case analysis models,

those from Other ethnic groups were significantly more likely to belong to Non-responders (*OR* = 1.956; CI: 1.444-2.649, *p* = .008), and High-severity-Slow Responders class (*OR* = 2.355; CI: 1.628-3.408, *p* =.010) compared to White populations. Results remained consistent with the non-imputed model when all ethnic minority groups were compared to Black patients: Asian and Other ethnic groups had higher odds of belonging to Non-responders and High-severity-Slow Responders classes than Black patients.

Discussion

Rate of Change between Ethnic Groups and Identification of Classes

Three depression and four anxiety symptom trajectories were identified, illustrating that examining treatment responses as a single population (i.e., one averaged growth trajectory) or at two-time points (i.e., pre-and post-test means) may mask critical differences in how patients' symptoms change during treatment. Consistent with earlier work (Lutz et al., 2009; Saunders et al., 2019; Stulz et al., 2007), highly distressed patients either responded quickly (High-severity Responder) or exhibited minimal improvement throughout treatment (Non-responders). Most symptom reduction occurred within four-to-six sessions for people who responded to treatment, mirroring previous findings (Stochl et al., 2020; Trombello et al.,2020).

The average growth trajectory suggested that depression and anxiety symptoms decreased throughout treatment, and patients ended treatment slightly below the clinical cut-off scores for depression (i.e., PHQ-9 <10) but not anxiety. Linear growth modelling suggested that White patients had significantly lower symptom severity than BAME patients at baseline. There were significant differences in the rate of change between BAME and White patients responses to treatment, suggesting BAME and White ethnic groups did not respond to treatment at an equal rate.

Association between Ethnicity, Sociodemographic, Treatment Variables and Trajectories

Ethnicity

The present study extended existing research by demonstrating the limitations of using ethnicity as a binary variable to examine session-by-session change patterns. There was ethnic variation in treatment responses between White and BAME populations after

adjusting for IMD. White patients had a lower risk of being classified into all high-severity depressive and anxiety symptom trajectories than BAME patients. Additional analyses illustrated nuanced differences between ethnic groups: relative to White patients, Asian patients had increased odds of belonging to Non-responders and High-severity Responders than the Moderate-severity Responders trajectory.

Similarly, for anxiety symptoms, there were differences between White and BAME populations where White patients were more likely to begin treatment within the moderate-range of anxiety symptoms than being associated Non-responders or High-severity-Slow responders trajectories. This difference persisted for Asian and Other Ethnic groups such that Asian and Other Ethnicities were more likely to belong to Non-responders and High-severity-Slow responders trajectories than Moderate-responder trajectory than White patients. Stratified analyses revealed that Asian patients consistently showed higher likelihood of belonging to Non-responders and High-severity Responders depressive symptom trajectories when compared to Black patients after adjusting for IMD.

Several qualitative findings could help explain ethnic differences between White and Asian participants. There is a possibility that Asian patients delayed seeking help for depression, which could explain the higher risk of being in trajectories with higher symptom severity than White and Black patients. Social and culturally linked stigma have been proposed as a key deterrent to formal help seeking among South Asian communities in the U.K. (Karasz et al., 2019), such that Asian patients may perceive disclosure of emotions as a sign of weakness. Additionally, they may believe that openly discussing mental illness will bring shame upon the family (Lowenthal et al., 2012). As a result, patients from South Asian communities may keep their struggles within the immediate family and not utilise mental health services (Karasz et al., 2019).

In line with this, South Asian patients may exhibit higher self-concealment behaviour than White and Black patients, leading to non-response or slower treatment response (for anxiety). Self-concealment is a coping strategy in which patients conceal distressing and intimate information from therapists to protect themselves from perceived threat and avoid stigma (Lin & Farber, 2020). In addition, people with high levels of self-concealment are less likely to hold a positive help-seeking attitude and may have difficulties building therapeutic relationships; this pattern of engagement interferes with the therapeutic alliance, impeding the treatment response (Kelly & Yuan, 2009). Indeed, higher self-concealment behaviour is found to be associated with a greater likelihood of belonging to the treatment non-response trajectory (Lin & Farber, 2020).

While CBT helped patients alleviate their symptoms, patients have historically reported that treatment was incompatible with their needs (Lowenthal et al., 2012; Yasmin-Qureshi & Ledwith, 2020) as there was little scope to discuss culturally relevant stressors, and religious beliefs were overlooked. Some patients shared that their therapists appeared hesitant to enquire about their culture or racialised experiences due to inadequate knowledge or cultural competency (Vahdaninia et al., 2020). However, in another study (Tarabi et al., 2020), Pakistani patients regarded CBT as a learning process; they were allowed to overcome the cultural stigma associated with help-seeking behaviours in treatment and learned practical coping strategies. Therefore, these qualitative studies highlighted the importance of therapists' ability to deliver culturally sensitive interventions to address the stigma associated with help-seeking behaviour.

Sociodemographic and Treatment Variables

Several socio-demographic and treatment variables were associated with differential trajectory class membership. Relative to Moderate-severity Responders

trajectories, the following attributes were associated with greater odds of having poor treatment prognosis for both anxiety and depression symptoms: older age, unemployment, higher pre-treatment anxiety and depression scores, being prescribed psychotropic medication at baseline, and LTCs. Depression and anxiety trajectory classes were differentiated by gender, local area deprivation, and treatments received. Being a man, residing in deprived areas, and received a HI intervention were associated with high-severity depressive trajectories. Although other HI interventions were associated with belonging to the depression Non-responders trajectory class, the present study could not disentangle which specific type(s) of HI treatment(s) were most strongly associated with treatment non-response due to the small numbers of other HI treatments offered.

The current study also extends previous research and existing policies (e.g., Department of Health, 2011), showing that ethnic disparities should be examined along with other determinants of health such as social circumstances (unemployment), comorbidity of health (LTCs), and neighbourhood environments. Perhaps the most interesting finding in this study was the association between local area deprivation with Non-responders and High-severity Responder depression but not anxiety trajectories. More specifically, ethnic differences in treatment response persisted despite controlling for area deprivation. These findings suggest that living in more deprived areas may negatively impact the likely course of treatment for Asian and Other Ethnic groups more than White populations. There is a possibility that Asian and Other Ethnicity patients who resided in deprived areas delay the need for mental health intervention and seek help when symptoms affected their social functioning.

Another reason that might explain why patients who resided in more deprived areas were associated with poorer outcomes is that they could be experiencing learned

helplessness (Madubata et al., 2018) and a lower sense of control over well-being, resulting in higher symptoms severity at treatment initiation. Additionally, learned helplessness has been found to mediate the relationship between depression and experiences of racial discrimination (Madubata et al., 2018). From this perspective, learned helplessness stems from constant exposure to uncontrollable social situations (e.g., lack of accessible resources in deprived areas), as well as inescapable experiences (e.g., systemic discrimination, marginalisation). Another study (Wickham et al., 2014) found that lack of trust towards others due to discrimination stress, and experiences of discrimination fully mediated the relationship between area deprivation and persistence of depressive symptoms. Hence, these findings may explain the association between area deprivation and depression Non-responders and High-severity trajectories**.**

Strengths

This is the first study to investigate ethnic variation in trajectories of symptom change using a large clinical dataset. The study integrated a person-centred analytical approach to model heterogeneity in symptom change and a variable-centred approach, allowing the prediction of class membership using ethnicity, sociodemographic, and treatment variables. The R3STEP procedure ensured latent classes identified were not influenced by baseline covariates entered into the model, allowing the examination of multiple covariates at once. The study also demonstrated the benefits of using GMM to identify subpopulations of people at risk of poor treatment outcomes.

In response to the initiatives to address mental health disparities experienced by BAME populations, this research's analytical approach provided insight into an under-studied area and illustrated nuanced differences between ethnic groups. In particular, the current study found that there was no ethnic variation between White and Black, Chinese,

Mixed-Heritage, and Other ethnicity for depression symptoms. These finding indicates that other sociodemographic and treatment variables could better explain the likelihood of being a treatment Non-responder than ethnicity alone.

Sensitivity analyses demonstrated that multinomial logistic models were stable, with findings replicated between imputed and observed datasets. Lastly, the naturalistic cohort of outpatients enhanced the external validity and generalisability of findings. The baseline factors assessed for their association with trajectory class membership are routinely collected in IAPT services. Therefore, findings of this study have utility in informing clinical practice, and if replicated, may have the potential to influence service-level change.

Limitations

The outcomes of this study should be interpreted with caution considering methodological limitations. Despite having a large sample size, many patients did not have recorded ethnicity, resulting in data needing to be collapsed into the six broad categories used by the Office for National Statistics and the U.K. Census. This prevented a granular investigation of ethnic variation within each overarching ethnic group. Additionally, missing ethnicity data might have influenced the estimates of variation in depression symptom trajectories between ethnicity groups. Although methods for handling missing information (e.g., multiple imputations) were available, it is possible that ethnicity data were not missing at random and imputing these data may produce biased estimates. Thus, more attention must be given to ensuring accuracy and completeness of ethnicity by the clinical services that collected the data used in this study.

Secondly, the shifting patterns of immigration across different BAME communities have implications for services: there is a necessity for service providers to

improve staff's cultural competencies to meet the needs of multicultural populations. Unfortunately, sociodemographic and treatment variables included in the analyses only captured a subset of variables associated with trajectory membership. Other factors such as religion, sexual orientation, history of prior psychological treatment and patterns of treatment engagement (e.g., attrition, missed appointments) were not included; some of the effects found in the present study could be due to such confounding variables. Additionally, the study could not examine the intersectionality of various sociodemographic characteristics (e.g., ethnicity and gender) and their influence on patients' lived experiences, which could ultimately impact trajectory memberships.

Implications and Recommendations

Based on these findings, it is plausible that there are variations in the symptom trajectories of depression and anxiety across different ethnic groups during psychological therapy. However, further studies are needed to replicate the results of the GMM described here to draw reliable conclusions. Further work investigating depression symptom trajectories with a subset of ethnic groups (e.g., among those of different Asian ethnicities) is needed to explore differential trajectory membership and identify subgroups at risk of poor prognoses. Additionally, future work may benefit from examining the intersections of various sociodemographic variables, particularly ethnicity and deprivation. The intersectionality of various sociodemographic characteristics may manifest as ethnic disparities in the prevalence and severity of depressive symptoms (Hangrove et al., 2020). Including mediating variables such as self-concealment, perceived discrimination, learned helplessness, use of interpreters, levels of acculturation, and social support (Buckman et al., 2021), may help explain differences in treatment response.

Treatment types examined in the current study were limited to HI interventions. Future studies could examine ethnic variation in LI interventions and consider any differences between LI and HI interventions. This would be particularly informative for IAPT services and services that offer digital and other LI treatments for adults with depression. Offering accessible guided self-help psychological intervention is becoming increasingly popular globally as part of the strategy to increase treatment accessibility in non-Western populations (Salamanca-Sanabria et al., 2018). Future research may also benefit from testing whether engagement patterns (e.g., attrition, missed appointments, session numbers) are also associated with ethnic variations.

Valid and reliable ethnicity data are crucial for researchers and service auditors to investigate ethnic differences in mental health treatments and initiate service-level intervention to improve the quality of care (Saunders et al., 2013). As demonstrated in this study, data availability enabled the investigation of ethnic differences in treatment responses. Therefore, services should examine how current practices could be improved to ensure data completeness.

Services should also seek to understand socio-cultural issues within the specific communities that they serve. Treatment non-response could, in part, be due to a lack of cultural sensitivity in treatment. Therefore, treatment providers could seek feedback from those who do not respond to treatment or have a slower treatment response to discuss clients' preferences regarding whether they would like to incorporate religious or cultural beliefs into their treatment. Exploring these questions at intake assessments may enhance treatment accessibility and the appropriateness of treatment for the intended communities. Therefore, therapists need to broach conversations about race and culture (Beck, 2016).

Hence, services might seek to offer additional supervision or training to increase cultural competency.

Conclusions

This study identified distinct patterns of depression and anxiety symptom change across ethnic groups and examined whether ethnicity was associated with different trajectories of change. Findings illustrated three depressive and four anxiety trajectories of symptom change. More than two-thirds of the cohort responded to treatment, while symptoms remained persistently high for those who did not respond to treatment. Several pre-treatment variables were associated with poor prognosis: ethnicity, unemployment, area deprivation, prescribed medications, higher baseline anxiety, depression scores, and LTCs.

This research provides preliminary evidence that Asian patients had increased odds of belonging to high-severity depressive and anxiety symptom trajectories than White and Black patients. Furthermore, Other Ethnic groups were associated with Non-responders and High-severity-Slow Responders classes compared to White and Black ethnicities. These differences were not explained by social adversities (unemployment, residing in deprived areas), clinical complexity (higher baseline symptom severity, prescribed psychotropic medications), or comorbidity of LTCs. The aggregated ethnicities could not tease apart which ethnic group specifically was associated with treatment non-response. More studies are needed to investigate depression symptom trajectories with a subset of ethnic groups and examine the interaction effects of predictors on trajectory membership.

References

Aggarwal, N. K., Pieh, M. C., Dixon, L., Guarnaccia, P., Alegria, M., & Lewis-Fernandez, R. (2016). Clinician descriptions of communication strategies to improve treatment engagement by racial/ethnic minorities in mental health services: a systematic review. *Patient Education and Counseling*, *99*(2), 198-209.

Alegría, M., NeMoyer, A., Bagué, I. F., Wang, Y., & Alvarez, K. (2018). Social determinants of mental health: where we are and where we need to go. *Current Psychiatry Reports*, *20*(11), 1-13.

Amati, F., Banks, C., Greenfield, G., & Green, J. (2018). Predictors of outcomes for patients with common mental health disorders receiving psychological therapies in community settings: A systematic review. *Journal of Public Health*, 40(3), e375–e387.

Anik, E., West, R. M., Cardno, A. G., & Mir, G. (2020). Culturally adapted psychotherapies for depressed adults: A systematic review and meta-analysis. *Journal of Affective Disorders, 12*(4),53-65.

Asparouhov, T., & Muthén, B. (2014). Auxiliary variables in mixture modeling: Three-step approaches using M plus. *Structural equation modeling: A multidisciplinary Journal*, *21*(3), 329-341.

Bailey, R. K., Mokonogho, J., & Kumar, A. (2019). Racial and ethnic differences in depression: current perspectives. *Neuropsychiatric disease and treatment*, *15*, 603.

Bassey, S., & Melluish, S. (2013). Cultural competency for mental health practitioners: A selective narrative review. *Counselling psychology quarterly*, *26*(2), 151-173.

Beck, A., & Naz, S. (2019). The need for service change and community outreach work to support trans-cultural cognitive behaviour therapy with Black and Minority Ethnic communities. *the Cognitive Behaviour Therapist*, *12*.

Benish, S. G., Quintana, S., & Wampold, B. E. (2011). Culturally adapted psychotherapy and the legitimacy of myth: A direct comparison meta-analysis. *Journal of Counselling Psychology*, *58*(3), 279–289. doi:10.1037/a0023626

Buckman, J. E., Saunders, R., Cohen, Z. D., Barnett, P., Clarke, K., Ambler, G., ... & Pilling, S. (2021). The contribution of depressive 'disorder characteristics' to determinations of prognosis for adults with depression: an individual patient data meta-analysis. *Psychological Medicine*, 1-14.

Clark, D. M., Layard, R., Smithies, R., Richards, D. A., Suckling, R., & Wright, B. (2009).

Improving access to psychological therapy: Initial evaluation of two UK demonstration sites. *Behaviour Research and Therapy*, *47*(11), 910-920.

Clark D. M. (2011). Implementing NICE guidelines for the psychological treatment of depression and anxiety disorders: the IAPT experience. *International Review of Psychiatry (Abingdon, England)*, *23*(4), 318–327. doi:10.3109/09540261.2011.606803

Cuijpers, P., van Lier, P. A., van Straten, A., & Donker, M. (2005). Examining differential effects of psychological treatment of depressive disorder: An application of trajectory analyses. *Journal of Affective Disorders*, *89*(1-3), 137-146.

Delgadillo, J., Asaria, M., Ali, S., & Gilbody, S. (2016a). On poverty, politics and psychology: the socioeconomic gradient of mental healthcare utilisation and outcomes. *The British Journal of Psychiatry*, *209*(5), 429-430.

Delgadillo, J., Moreea, O., & Lutz, W. (2016b). Different people respond differently to therapy: A demonstration using patient profiling and risk stratification. *Behaviour Research and Therapy*, *79*, 15-22.

Delgadillo, J., de Jong, K., Lucock, M., Lutz, W., Rubel, J., Gilbody, S., ... & McMillan, D. (2018). Feedback-informed treatment versus usual psychological treatment for depression and anxiety: a multisite, open-label, cluster randomised controlled trial. *The Lancet Psychiatry*, *5*(7), 564-572.

Department of Health, 2005, Delivering race equality in mental health care: An action plan for reform inside and outside services and the Government's response to the Independent inquiry into the death of David Bennett. Retrieved from https://webarchive.nationalarchives.gov.uk/20130123204153/http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4100773

Department of Health (2011). No Health Without Mental Health: a cross-government outcomes strategy, Retrieved from: https://www.gov.uk/government/publications/no-health-without-mental-health-a-cross-government-outcomes-strategy

Department of Health and Social Care (2012). *The NHS Constitution for England.* Retrieved from https://www.gov.uk/govenment/publications/the-nhs-constitution-for-england/the-nhs-constitution-for-england

Department of Health. (2014). *Closing the Gap: Priorities for Essential Change in Mental Health*. Department of Health Retrieved from www.gov.uk/government/uploads/system/uploads/attachment_data/file/281250/Closing_the_gap_V2_-_17_Feb_2014.pdf

Department of Communities and Local Government. (2015). *English Indices of Deprivation.* Retrieved from https://www.gov.uk/government/collections/english-indices-of-deprivation.

Gyani, A., Shafran, R., Layard, R., & Clark., D.M. (2013). Enhancing recovery rates: Lessons from year one of IAPT. *Behaviour research and therapy, 51(9),* 597-606.

Hall, G. C. N., Ibaraki, A. Y., Huang, E. R., Marti, C. N., & Stice, E. (2016). A meta-analysis of cultural adaptations of psychological interventions. *Behavior therapy*, *47*(6), 993-1014.

Hinton, D. E., Rivera, E. I., Hofmann, S. G., Barlow, D. H., & Otto, M. W. .(2012). Adapting CBT for traumatized refugees and ethnic minority patients: Examples from culturally adapted CBT (CA-CBT). . *Transcultural Psychiatry, 49(2),* 340-365.

Hu, L. T., & Bentler, P. M. (1999). Cut-off criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modeling: a Multidisciplinary Journal*, *6*(1), 1-55.

Hull, S. A., Mathur, R., Badrick, E., Robson, J., & Boomla, K. (2011). Recording ethnicity in primary care: assessing the methods and impact. *British Journal of General Practice, 61*(586), 290-294.

Hussain, F., & Cochrane, R. (2004). Depression in South Asian women living in the UK: a review of the literature with implications for service provision. *Transcultural Psychiatry*, *41*(2), 253-270.

Iqbal, G., Johnson, M. R., Szczepura, A., Gumber, A., Wilson, S., & Dunn, J. A. (2012). Ethnicity data collection in the UK: the healthcare professional's perspective. *Diversity and Equality in Health and Care*, *9*(4), 281-290.

Jakobsen, J. C., Gluud, C., Wetterslev, J., & Winkel, P. (2017). When and how should multiple imputation be used for handling missing data in randomised clinical trials–a practical guide with flowcharts. *BMC Medical Research Methodology*, *17*(1), 1-10.

Karasz, A., Gany, F., Escobar, J., Flores, C., Prasad, L., Inman, A., ... Diwan, S. (2016). Mental health and stress among South Asians. *Journal of Immigrant and Minority Health*, 1-8.

Kelly, A. E., & Yuan, K. H. (2009). Clients' secret keeping and the working alliance in adult outpatient therapy. *Psychotherapy: Theory, Research, Practice, Training*, 46(2), 193–202

Kroenke, K., Spitzer, R. L. and Williams, J. B. (2001). The PHQ-9: validity of a brief depression severity measure. *Journal of General Internal Medicine*, 16, 606–13.

Lambert, M. J., Whipple, J. L., & Kleinstäuber, M. (2018). Collecting and delivering progress feedback: A meta-analysis of routine outcome monitoring. *Psychotherapy*, *55*(4), 520.

Liang, J., Xu, X., Quiñones, A. R., Bennett, J. M., & Ye, W. (2011). Multiple trajectories of depressive symptoms in middle and late life: racial/ethnic variations. *Psychology and Aging*, *26*(4), 761-777.

Lin, T., & Farber, B. A. (2021). Trajectories of depression in psychotherapy: How client characteristics predict clinical improvement. *Journal of Clinical Psychology*.

Lo, Y., Mendell, N. R., & Rubin, D. B. (2001). Testing the number of components in a normal mixture. *Biometrika*, *88*(3), 767-778.

Loewenthal, D., Mohamed, A., Mukhopadhyay, S., Ganesh, K., & Thomas, R. (2012). Reducing the barriers to accessing psychological therapies for Bengali, Urdu, Tamil and Somali communities in the UK: some implications for training, policy and practice. *British Journal of Guidance & Counselling*, *40*(1), 43-66.

Lutz, W., Stulz, N., & Köck, K. (2009). Patterns of early change and their relationship to outcome and follow-up among patients with major depressive disorders. *Journal of Affective Disorder, 118(1-3)*, 60-68.

Lutz, W., Hofmann, S. G., Rubel, J., Boswell, J. F., Shear, M. K., Gorman, J. M., ... & Barlow, D. H. (2014). Patterns of early change and their relationship to outcome and early treatment termination in patients with panic disorder. *Journal of Consulting and Clinical Psychology*, *82*(2), 287.

Lutz, W., Arndt, A., Rubel, J., Berger, T., Schröder, J., Späth, C., ... & Moritz, S. (2017). Defining and predicting patterns of early response in a web-based intervention for depression. *Journal of medical Internet Research*, *19*(6), e7367.

Madubata, I. J., Odafe, M. O., Talavera, D. C., Hong, J. H., & Walker, R. L. (2018). Helplessness Mediates Racial Discrimination and Depression for African American Young Adults. *Journal of Black Psychology*, *44*(7), 626–643.

Mansour, R., Tsamakis, K., Rizos, E., Perera, G., Das-Munshi, J., Stewart, R., & Mueller, C. (2020). Late-life depression in people from ethnic minority

backgrounds: Differences in presentation and management. *Journal of Affective Disorders*, *264*, 340-347.

McDevitt-Petrovic, O. (2019). *Improving Access and Treatment Effectiveness Using Low Intensity Cognitive Behavioural Therapy for Mild to Moderate Level Mental Health Disorders, Including Medically Unexplained Symptoms, in Northern Ireland* (Doctoral dissertation, Ulster University).

McLennan, D., Noble, S., Noble, M., Plunkett, E., Wright, G., & Gutacker, N. (2019). The English indices of deprivation 2019: Technical report.

Mercer, L., Evans, L. J., Turton, R., & Beck, A. (2019). Psychological therapy in secondary mental health care: Access and outcomes by ethnic group. *Journal of Racial and Ethnic Health Disparities*, *6*(2), 419-426.

Memon, A., Taylor, K., Mohebati, L. M., Sundin, J., Cooper, M., Scanlon, T., & de Visser, R. (2016). Perceived barriers to accessing mental health services among black and minority ethnic (BME) communities: a qualitative study in Southeast England. *BMJ Open*, *6*(11), e012337.

Morris, R. M., Sellwood, W., Edge, D., Colling, C., Stewart, R., Cupitt, C., & Das-Munshi, J. (2020). Ethnicity and impact on the receipt of cognitive–behavioural therapy in people with psychosis or bipolar disorder: an English cohort study. *BMJ open*, *10*(12), e034913.

Mundt, J. C., Marks, I. M., Shear, M. K. and Greist, J. H. (2002). The Work and Social Adjustment Scale: a simple measure of impairment in functioning. British Journal of Psychiatry, 180, 461–464. https://doi.org/10.1192/bjp.180.5.461

Muthén, B. (2006). The potential of growth mixture modelling. *Infant and Child Development*, *15*(6), 623.

Muthén, B., & Muthén, L. (2017). *Mplus* (pp. 507-518). Chapman and Hall/CRC.

National Collaborating Centre For Mental Health (2019*). The Improving Access to Psychological Therapies Manual.*

Naz, S., Gregory, R., & Bahu, M. (2019). Addressing issues of race, ethnicity and culture in CBT to support therapists and service managers to deliver culturally competent therapy and reduce inequalities in mental health provision for BAME service users. *The Cognitive Behaviour Therapist, 12*.

Nazroo, J. Y., Bhui, K. S., & Rhodes, J. (2020). Where next for understanding race/ethnic inequalities in severe mental illness? Structural, interpersonal and institutional racism. *Sociology of Health & Illness, 42*(2), 262-276.

NHS Digital (2020). *Psychological Therapies, Annual report on the use of IAPT services 2019–20.* Retrieved from https://digital.nhs.uk/data-and-information/publications/statistical/psychological-therapies-annual-reports-on-the-use-of-iapt-services

NICE (2010). CG90 Depression: treatment and management of depression in adults(update): NICE guideline (amended). Retrieved from: www.nice.org.uk/Guidance/CG90

Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural equation modeling: A multidisciplinary Journal, 14*(4), 535-569.

Office for National Statistics (ONS) (2003) *Ethnic group statistics: A guide for the collection and classification of ethnicity data.* London: ONS.

Office for National Statistics (ONS) (2013) *Ethnic Group: Harmonised Concepts and Questions for Social Data Sources.* London: ONS.

Owen, J., Adelson, J., Budge, S., Wampold, B., Kopta, M., Minami, T., & Miller, S. (2015). Trajectories of change in psychotherapy. *Journal of Clinical Psychology*, *71*(9), 817-827.

Spitzer, R. L., Kroenke, K., Williams, J. B. W. and Löwe, B. (2006). A brief measure forassessing generalized anxiety disorder. *Archives of Internal Medicine*, 166, 1092. https://doi.org/10.1001/ archinte.166.10.1092 *Concepts and Questions for Social Data Sources.* London: ONS

Public Health England. (2018). *Local Action on Health Inequalities: Understanding and Reducing Ehnic Inequalities in Health.* London: Public Health England. Retrieved from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/730917/local_action_on_health_inequalities.pdf.

Rubin, D. B. (1976). Inference and missing data. Biometrika, 63(3), 581–592. https://doi.org/10.2307/2335739

Salamanca-Sanabria, A., Richards, D., Timulak, L., Castro-Camacho, L., Mojica-Perilla, M., & Parra-Villa, Y. (2018). Assessing the efficacy of a culturally adapted cognitive behavioural internet-delivered treatment for depression: protocol for a randomised controlled trial. *BMC Psychiatry*, *18*(1), 1-11.

Saunders, C. L., Abel, G. A., El Turabi, A., Ahmed, F., & Lyratzopoulos, G. (2013). Accuracy of routinely recorded ethnic group information compared with self-reported ethnicity: evidence from the English Cancer Patient Experience survey. *BMJ open*, *3*(6), e002882.

Saunders, R., Buckman, J. E., Cape, J., Fearon, P., Leibowitz, J., & Pilling, S. (2019). Trajectories of depression and anxiety symptom change during psychological therapy. *Journal of Affective Disorders*, *249*, 327-335.

Saunders, R., Buckman, J. E., Stott, J., Leibowitz, J., Aguirre, E., John, A., ... & Pilling, S. (2021). Older adults respond better to psychological therapy than working-age adults: evidence from a large sample of mental health service attendees. *Journal of Affective Disorders*.

Saunders, R., Cape, J., Fearon, P., & Pilling, S. (2016). Predicting treatment outcome in psychological treatment services by identifying latent profiles of patients. *Journal of Affective Disorders, 197*, 107-115.

Saunders, R., Cape, J., Leibowitz, J., Aguirre, E., Jena, R., Cirkovic, M., ... & Buckman, J. E. (2020). Improvement in IAPT outcomes over time: are they driven by changes in clinical practice?. T*he Cognitive Behaviour Therapist*, *13*.

Smith, T., Noble, M., Noble, S., Wright, G., McLennan, D., & Plunkett, E. (2015). The English indices of deprivation 2015. *London: Department for Communities and Local Government.*

Stochl, J., Soneson, E., Stuart, F., Fritz, J., Walsh, A. E., Croudace, T., ... & Perez, J. (2021). Determinants of patient-reported outcome trajectories and symptomatic recovery in Improving Access to Psychological Therapies (IAPT) services. *Psychological Medicine*, 1-10.

Stulz, N., Lutz, W., Leach, C., Lucock, M., & Barkham, M. (2007). Shapes of early change in psychotherapy under routine outpatient conditions. *Journal of Consulting and Clinical Psychology*, *75*(6), 864.

Stulz, N., Thase, M. E., Klein, D. N., Manber, R., & Crits-Christoph, P. (2010). Differential effects of treatments for chronic depression: a latent growth model reanalysis. *Journal of Consulting and Clinical Psychology*, *78*(3), 409.

Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: the GAD-7. *Archives of internal medicine*, *166*(10), 1092-1097.

Tarabi, S. A., Loulopoulou, A. I., & Henton, I. (2020). "Guide or conversation?" The experience of Second-Generation Pakistani Muslim men receiving CBT in the UK. *Counselling Psychology Quarterly*, *33*(1), 46-65.

Trombello, J. M., South, C., Sánchez, A., Kahalnik, F., Kennard, B. D., & Trivedi, M. H. (2020). Two Trajectories of Depressive Symptom Reduction Throughout Behavioral Activation Teletherapy Among Underserved, Ethnically Diverse, Primary Care Patients: A VitalSign6 Report. *Behavior Therapy*, *51*(6), 958-971.

Vahdaninia, M., Simkhada, B., Van Teijlingen, E., Blunt, H., & Mercel-Sanca, A. (2020). Mental health services designed for Black, Asian and Minority Ethnics (BAME) in the UK: a scoping review of case studies. *Mental Health and Social Inclusion*, *24* (2),81-95.

Vermunt, J. K. (2010). Latent Class Modelling with Covariates: Two Improved Three-Step Approaches. *Political Analysis, 18,* 450-469

Wakefield, S., Kellett, S., Simmonds-Buckley, M., Stockton, D., Bradbury, A., & Delgadillo, J. (2021). Improving Access to Psychological Therapies (IAPT) in the United Kingdom: A systematic review and meta-analysis of 10-years of practice-based evidence. *British Journal of Clinical Psychology*, *60*(1), 1-37.

Wang, Z., & Jegelka, S. (2017, July). Max-value entropy search for efficient Bayesian optimization. In *International Conference on Machine Learning* (pp. 3627-3635). PMLR.

Wickham, S., Taylor, P., Shevlin, M., & Bentall, R. P. (2014). The impact of social deprivation on paranoia, hallucinations, mania and depression: the role of discrimination social support, stress and trust. *PloS one, 9*(8), e105140.

Wickrama, K., Lee, T. K., O'Neal, C. W., & Lorenz, F. (2016). *Higher-order growth curves and mixture modeling with Mplus: A practical guide*. Routledge.

Williams, Monnica Terwilliger, Lloyd Kevin Chapman, Judy Wong, and Eric Turkheimer. "The role of ethnic identity in symptoms of anxiety and depression in African Americans." *Psychiatry Research* 199, no. 1 (2012): 31-36.

Williams, D. R. (2018). Stress and the mental health of populations of color: Advancing our understanding of race-related stressors. *Journal of Health and Social Behaviour, 59*(4), 466-485.

World Health Organization. (1992). *The ICD-10 classification of mental and behavioural disorders: clinical descriptions and diagnostic guidelines*. Geneva: World Health Organization.

World Health Organization. (2017). *Depression and other common mental disorders: global health estimates* (No. WHO/MSD/MER/2017.2). World Health Organization.

Part 3: Critical Appraisal

Introduction

This chapter contains a background to the research topic, reflections on the research process, and application of the Behaviour Change Wheel (BCW) to understand factors contributing to challenges encountered in ethnic disparities research.

Background

My year-long placement as a trainee in Improving Access to Psychological Therapy (IAPT) sparked my interest in examining ethnic variation in treatment responses. I was intrigued by the IAPT programme, where empirically supported psychological interventions were accessible for the general public via a self-referral portal. The standard outcome measures collected in every session could inform therapists of patients who did not respond to treatment. Therapists were thus prompted to discuss potential difficulties with the patient. Additionally, the benefits of rigorous data collection meant that these data could be used for research and service improvements, informing policies and improving care. This data-driven approach and standardised treatment was a big contrast to the healthcare model that I had worked in before training in Singapore. I began to consider the transferability of the IAPT service model to Singapore, where illness beliefs and healthcare systems are drastically different from the United Kingdom (U.K.).

Unlike the U.K., where free healthcare is readily available through the National Health Service, Singapore's healthcare philosophy emphasises individuals' responsibility and the need for co-payment for all services provided (e.g., £35 per session of psychological intervention in a government clinic). Differences in healthcare systems may pose unique barriers to service utilisation, accessibility, and treatment engagement. In this regard, Singaporean patients are akin to consumers, which alters the expectations placed on mental healthcare services. This dynamic emphasises therapists' abilities to provide

effective treatment to underserved communities who cannot afford longer-term treatment without government subsidies. Furthermore, psychological therapies are not readily available in primary care settings in Singapore (i.e., there is no self-referral system to seek psychological support at the time of writing). Every patient requires a referral from a medical doctor to a clinical psychologist or secondary care setting where psychological intervention is available. Therefore, the IAPT programme (e.g., the option to self-referral, digitalisation of therapies, time-limited sessions, manualised approach) may benefit the "consumers" in Singapore and therapists to provide effective intervention under time pressure.

As someone from a South-East Asian Chinese background, I am familiar with the social stigma and culturally held beliefs relating to the aetiology of depression and help-seeking behaviours. In training, I often questioned the applicability of some therapeutic modalities to non-Western contexts. This prompted my interest in examining how cultural influences are integrated into evidence-based therapies (Chapter One) and their effectiveness. Given that IAPT aims to provide accessible treatment for a diverse population using standardised treatment, I was curious to understand if there were ethnic differences in treatment outcomes, especially given that BAME communities are often under-represented in population-based research (Chapter Two). Lastly, my personal goal was to gain advanced statistical analyses skills using a large dataset.

Reflections on the Research Process

Ethnicity Data

Conducting this research gave me new insights into the challenges associated with ethnic disparity research. As this is my first time working with a secondary dataset, I had not given much thought to the impact of each decision made during the data cleaning

process. Due to the data cleaning strategy employed, I could not ascertain the proportion of cases that met inclusion criteria but had missing ethnicity data. Knowing the proportion of missing ethnicity data could provide a useful estimation of the cases lost due to incomplete data. However, I was unable to perform this due to time constraints. Further analysis could also have been conducted comparing treatment outcomes of those who had recorded and unrecorded ethnicity data to examine if there were different rates of treatment responses over time. This work can be explored further in future research.

Although the dataset provided a unique opportunity to examine ethnic variations in treatment responses while taking some sociodemographic and clinical variables into account, the dataset lacked data on a range of determinants related to health disparities. For instance, socioeconomic status, income and educational attainment are predictors of disparities in health but were not available in the dataset (Adler & Newman, 2002). Furthermore, I soon realised that the Office for National Statistics (2003) categorisation of ethnicity is too simplistic to examine ethnic disparities in mental health. For instance, A British-born South Asian may have different lived experiences compared to an individual who immigrated from Pakistan as an adult. This poses a confounder for this research as migration experiences increase the risk for depression among immigrants (e.g., Hosseini et al., 2017). Although some IAPT services had started collecting information on country of birth and spoken language(s), these data are not available in the current dataset to better capture the multifaceted nature of ethnicity.

Cultural Competence

The research process also highlighted that data incompleteness is avoidable, as recommended by the IAPT BAME Service User Positive Guide (Beck et al., 2019), IAPT services should record the ethnicity of all the patients who access the service. This requires

all therapists to initiate conversations about race, ethnicity, and culture. Furthermore, the Department of Health (2012) calls for better therapeutic between healthcare providers and patients, particularly those from BAME communities.

Therapists' reluctance to initiate conversations about culture and collect ethnicity data could be due to a general lack of cultural competency skills. Cultural competency refers to a set of congruent behaviours, attitudes and policies that come together in a system, enabling professionals to work effectively in cross-cultural situations (Cross et al., 1989, as cited in Baseey & Melluish, 2013). This may involve broaching conversations about race, ethnicity and culture as part of the rapport-building process (Day-Vines et al., 2018). The therapist may ask patients what will help them feel respected and inquiring about cultural history and identity to affirm the patient's cultural experience, fostering trust and rapport within the patient-provider relationship. Indeed, evidence suggests that therapists who initiated conversations about racial, ethnic, and cultural differences had improved working alliances (King & Summers., 2020). It can be argued that incorporating cultural perspectives into mental health treatment is deemed an ethical responsibility of psychologists to provide equitable care for diverse populations and constitutional values of the National Health Service (Department of Health, 2012)

As a result, cultural competency training has become ubiquitous in training programs as a strategy to increase therapists' awareness of the impact of unconscious biases, racism, and cultural differences when working with diverse populations (Bennett et al., 2013). However, how cultural competency skills are implemented in practice is not known.

Indeed, 'barriers to collection' and 'barriers to asking' were some of the main themes reported by healthcare professionals to be obstacles in asking about ethnicity (Iqbal et al.,

2012). This knowledge-transfer gap can be explained using the Behaviour Change Wheel (BCW; Michie et al., 2011) and Capability, Opportunity, Motivation-Behaviour (COM-B; Michie et al., 2014) model of behaviour change.

The Behaviour Change Wheel and the COM-B Model

I came across the Behaviour Change Wheel (BCW) framework while completing a public health/policy placement applying behaviour change approaches to tackle complex social and public health challenges. The framework provides an alternative understanding of the challenges associated with the implementation gap between training (e.g., transferability of cultural competencies skills, data collection), research (current research findings) and routine practice (e.g., enquiring about culture, updating patient demographic data). The COM-B analysis can be used to understand the determinants of behaviour while the BCW framework conveys a theoretical based approach for intervention development.

This includes examining the facilitators and barriers that influence the actors' (e.g., the therapists) behaviours.

According to the COM-B model (Michie et al., 2011), behaviours occur as a result of three interacting mechanisms: the capability to perform a behaviour (C), the opportunity for the behaviour to occur provided by the environment (O), and the motivation to perform the behaviour (M). Therefore, the therapists' behaviours (e.g., asking a question about ethnicity) exist in a system that either facilitates or hinders the enactment of those behaviours. In order for behaviour change to occur, one has to change one or more of the three mechanisms (i.e., C, O, or M) so that the system is reconfigured, allowing the new behaviour to persist (Michie et al., 2014).

Capability refers to the individuals' psychological (knowledge, skills, awareness) and physical (strength) ability to engage in a behaviour. Opportunity refers to the environmental (i.e., time, prompts in the clinical note systems, resources) and social (i.e., cultural norms within the service, social cues) contexts that facilitate the behaviour. Motivation refers to an individual's reflective process (e.g., beliefs about consequences, capabilities, professional /social identity) and automatic processes (e.g., emotions, wants, needs) about performing the behaviour.

Applying the COM-B Model

The following section will illustrate the application of the COM-B model to identify the barriers and facilitators that influence therapists' behaviours in relation to "improving the accessibility and effectiveness of healthcare for BAME populations by increasing therapists' ability to have conversations about race, culture and ethnicity". Table 1 presents possible influences was based on the existing literature 1.

Target Behaviours

When applying the COM-B model, the first step is to operationalise target behaviours by which the progress of change is measured. For a systemic and organisational change, an intervention would need to occur at different levels involving various actors in the systems (e.g., patients, administrative staff, therapists, supervisors, commissioners). However, this reflection will focus primarily on understanding behavioural influences for therapists. The proposed target behaviour is therapists' initiating conversations about ethnicity and cultural influences of the presenting problem in the assessment session. There are several beneficial impacts of this behaviour. Firstly, initiating these conversations allows the therapists to obtain information about ethnicity and input the data into patient information systems. This in turn, improves the

completeness and availability of data collection, which could be beneficial for future research on ethnic differences in trajectories of symptom change. Another by-product of this behaviour would be creating opportunities to explore whether patients would like their beliefs (e.g., religious practice) to be incorporated into treatment (i.e., providing culturally sensitive treatment). Furthermore, by improving therapists' ability to initiate difficult conversations, the therapist could obtain feedback from patients if they are at risk of poor treatment response (as highlighted in Chapter 2).

Table 1

Hypothesised Barriers and Facilitators to Initiate Conversations about Culture

Target behaviour:	Therapists to initiate conversations about ethnicity and cultural influences of the presenting problem in the assessment session.	
	Barriers	Facilitators
Capabilities	Lack of knowledge abou when and how to initiate conversations about cultural differences. Lack of knowledge on the importance of data completeness, and its contribution to service improvement and ethnic disparity research (Iqbal et al., 2012). Lack communication skills to broach about race, ethnicity and cultural beliefs Difficulty prioritizing and gauging the relevance of broaching the topic	Awareness that BAME participants are willing to offer ethnicity data and discuss cultural influences, and how this could be useful in sessions (Baker et al., 2005). Knowing how to effectively communicate with BAME populations about intentions (e.g., implications of data collections, outcome monitoring; Iqbal et al., 2012a). Knowing howto regulate emotions that arise when discussing race and cultural differences (Naz et al., 2019).
Physical opportunities	Lack of time to complete documentation, update patients' records. Lack of prioritisation in assessment to enquire about sociodemographic data. Limitation of patient record form to capture other information (Iqbal 2009)	Patient outcome monitoring system to prompt clinician that a patient is not responding to treatment. Prompts in patient record to collect data. Safe spaces (availability of rooms)

Social opportunities	Time-pressured, agenda driven supervision with inadequate time for reflection (Bassey & Melluish., 2013) Lack of access to supervisors with relevant experience.	
Motivation	Lack confidence to initiate conversations about race, racism, and discrimination (Naz et al.,2019). Belief that ethnicity data is irrelevant to practice, time consuming, and uncomfortable for patients (Wynia & Hasnain-Wynia, 2010). Belief that asking for ethnicity data would alienate patients (Baker et al., 2005). Fear of offending the patient by asking for ethnicity data (Wynia & Hasnain-Wynia, 2010).	Having the confidence to regulate own emotions that arise when having difficult conversations The therapist identifies as a someone who believes in providing equity care (Kings & Summers, 2020).

Identifying Barriers and Enablers

Capability. One of the barriers to Capability identified in the literature is therapists' lack of knowledge on how or when to address ethnicity in the therapeutic relationship (Maxie et al., 2006). This may influence therapists' willingness to ask questions about ethnicity and culture (Kings & Summers, 2020), which has the unintended consequence of therapists appearing disinterested in patients' cultural beliefs about mental health and help-seeking behaviours. Furthermore, therapists need to have the necessary skills to communicate their intentions effectively (e.g., explaining how data will be used; the purpose of enquiring about culture) when asked by patients. Indeed, Baker et al. (2005) found that therapists who were able to communicate effectively and appeared comfortable when discussing cultural differences were perceived by patients as more culturally competent. In contrast, therapists who could not communicate the purpose of conversations about cultural differences had poorer treatment engagement. Additionally, therapist may lack knowledge about the purpose and importance of data collection and its implications for service improvements and research (capability), which could influence how they feel (e.g., sense of inadequacy) when patients question the purpose of collecting ethnic data (motivation).

Motivation. Addressing issues around ethnicity and racism in therapy can often trigger difficult emotions for White therapists, such as fear, guilt, and shame (Naz et al., 2019). Therapists may be afraid of making mistakes or offending patients by asking questions about ethnicity and culture (Iqbal et al., 2012b), which can lead to avoidance of these topics. These fears may stem from the belief that they lack the skills to navigate difficult conversations (Iqbal et al., 2012b), or the belief that addressing racial differences in therapy may rupture the therapeutic alliance (Naz et al., 2019). However, the unintended consequences of not initiating the conversations about culture and race (i.e., target behaviours), may lead to patients experiencing therapists as avoidant and disinterested in their culture (Yasmin-Qureshi &

Ledwith, 2020). Any avoidance in addressing culture and race due to therapists' White privilege and fears of experiencing shame perpetuates racism (Naz et al., 2019). Alternatively, therapists avoided asking questions about ethnicity and culture because such conversations were viewed as time-consuming (Wynia & Hasnain-Wynia, 2010) when they had competing demands (e.g., high workload, pressured to provide time-limited and manualised therapy) that influenced their willingness to have difficult conversations.

Opportunity. For therapists to become skilled at initiating conversations about culture, they require a safe and secure supervisory relationship where they can be confident in their supervisors' skills at providing a space for learning and reflection. In a study conducted by Bassey and Melluish (2013), therapists reported insufficient time to reflect on culture in supervision as supervision sessions were often time-pressured and agenda-driven. Therapists also reported that the lack of access to culturally competent supervisors impeded their ability to consider cultural influences on manualised therapies delivered in IAPT. Therefore, supervisors are responsible for scaffolding supervisees' emotional regulation skills by working through shame and guilt arising in therapy (Naz et al., 2019) and improving their interpersonal communication skills.

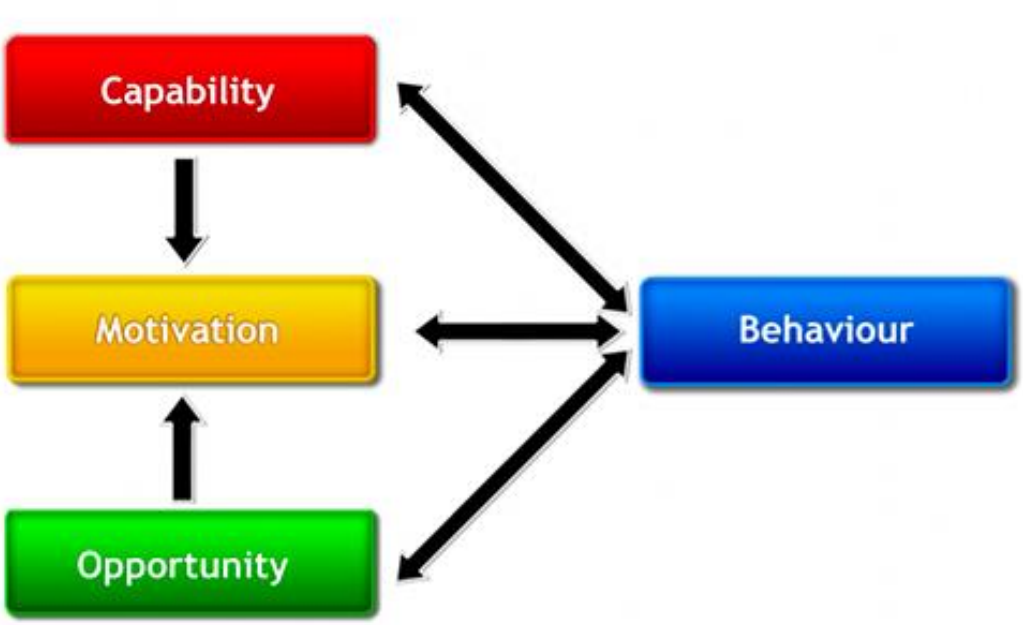
Given the nature of these emotions, there must be a safe and secure space (physical opportunity) and a trusting supervisory relationship (social opportunity). Furthermore, supervisors play a crucial role in assisting therapists to develop their professional identities and ethics (e.g., belief that therapists have a part to play in reducing differences in access and treatment) while learning about social inequalities faced by other socio-cultural groups (King & Summers, 2020).

For the target behaviour (initiate conversations about culture) to occur, therapists will need to gain knowledge about when and how to broach the topic (capability), have effective communication skills (capability) and the belief that having an open dialogue about cultural

differences may facilitate therapeutic rapport (motivation). Therapists' confidence and willingness to address culture in sessions could be facilitated by the availability of supervisors/colleagues who can provide reflective spaces for their learning (opportunity). With the availability of these facilitators, therapists would be more likely to initiate conversations about culture (behaviour) and integrate cultural beliefs into treatment. Once a therapist practices in supervision and successfully initiates conversations with BAME populations about culture, the knowledge and experience gained would then feedback to the C-O-M components. Therefore, the behaviour creates a positive feedback loop consisting of changes to mechanisms that influence behaviour sustainably over time (Michie et al., 2011; Figure 1).

Figure 1

The COM-B Model (Michie et al., 2011)



Implementing the COM-B Model

The next step would typically involve consulting various stakeholders to ascertain if the barriers and facilitators proposed to align with their experiences. Information obtained

from focus groups could refine influences identified according to the COM-B model and tailor interventions. According to the BCW framework (Michie et al., 2011), various types of intervention functions address components of the COM-B model. Increasing therapists' Capabilities can be achieved through imparting knowledge on how to initiate conversations about culture (education) effectively and skills to elicit patients' explanatory models of illness (training). Training programmes can include reflective practice to discuss power and privileges issues about the underserved communities. This would allow therapists to tolerate and regulate emotions when they reflect on the target behaviour. However, cultural competency training as a stand-alone strategy is insufficient to drive systemic and organizational change (Truong et al., 2014) as it only addresses the acquisition of knowledge and skills (capability) without ensuring there is Opportunity to perform the behaviour. Thus, cultural training alone may not adequately prepare therapists to meet the unique needs of culturally diverse communities.

Environmental restructuring (defined as increasing means and reducing barriers to increase Capability; Michie et al., 2011) may facilitate knowledge transfer in practice. Having physical prompts in the patients' record system alerting the therapist incompleteness of data, patient feedback systems, an option on the form allows patients and therapists to record self-identified ethnicity instead of a checklist, and allocating dedicated time for therapists to complete administrative tasks are examples of environmental restructuring that increase physical opportunities in the environment. Restructuring the social environment would involve supervisors modelling how to initiate conversations about culture, regulating emotions (e.g., showing vulnerabilities), and scaffolding reflexivity skills in supervision. Interventions that target Motivation can be achieved through a combination of modelling, persuasion and education. A supervisor may understand navigating difficult conversations (education) by role-playing in supervision (modelling, training). There is also evidence that

therapists motivated to discuss cultural issues were more likely to work in services that offered regular training and had more culturally diverse staff (Kings & Summers, 2020). Therefore, interventions need to tackle various components of the C-O-M to facilitate change. The effectiveness of these interventions can be evaluated using mixed methods to understand which elements of the interventions are most effective in changing therapists' behaviour. This is consistent with the Medical Research Council framework for developing and evaluating complex interventions (Craig et al., 2008) and NICE guidance on behaviour change (National Institute for Health and Care Excellence, 2014).

In practice, co-production typically begins during the early stages of the BCW framework. All stakeholders identify which behaviour performed by therapists would enable patients to feel that their voices and contributions (e.g., ethnicity data) will have a more significant impact on their care and equitable healthcare provision. Co-production views patients as experts in their own care and holds valuable insights as service users- a vital change driver (Morgan & Ziglio, 2007). Therefore, to achieve the outcome of "improving accessibility and effectiveness of healthcare for BAME populations by increasing therapists' abilities to have conversations about race, culture and ethnicity," services should consider using behaviour change and co-production strategies. This transdisciplinary approach to care is considered a promising method to delivering equitable services and creating sustainable change as it enables collaboration among various scientific disciplines, social actors, and service users to inform change strategies (West et al., 2019).

Final Reflections

Reflecting on the process of this research using growth-mixture modelling to identify subgroups of people who have different responses to treatment, my placement in a behaviour science service highlighted the importance of transdisciplinary approaches to drive systemic change. Overall, there is a need to improve the cultural competency of therapists working with

BAME populations. This can be achieved by using the behaviour change approach to increase therapists' ability to broach race, ethnicity, and culture topics. These conversations would facilitate therapeutic rapport and allow therapists to consider how interventions can be tailored to fit BAME population needs and obtain feedback if clients are not responding to treatment. Additionally, conversations about race and ethnicity enable therapists to gather information about patients' ethnicity, which may contribute to the BABCP BAME Positive Guide (Beck et al.,2019) and policy goals to improve the completeness of ethnicity data improve the quality of future ethnicity disparities research**.**

References

Adler, N. E., & Newman, K. (2002). Socioeconomic disparities in health: pathways and policies. *Health Affairs*, *21*(2), 60-76.

Bassey, S., & Melluish, S. (2013). Cultural competency for mental health practitioners: A selective narrative review. *Counselling Psychology Quarterly*, *26*(2), 151-173.

Baker, D. W., Cameron, K. A., Feinglass, J., Georgas, P., Foster, S., Pierce, D., ... & Hasnain-Wynia, R. (2005). Patients' attitudes toward health care providers collecting information about their race and ethnicity. *Journal of General Internal Medicine*, *20*(10), 895-900.

Beck, A., Naz, S., Brooks, M., & Jankowska, M. (2019). Black, Asian and Minority Ethnic Service User Positive Practice Guide 2019.

Bennett, J. (2013). Training mental health professionals in cultural capability: sustainability of knowledge and skills. *International Journal of Culture and Mental Health*, *6*(1), 72-80.

Craig, P., Dieppe, P., Macintyre, S., Michie, S., Nazareth, I., & Petticrew, M. (2008). Developing and evaluating complex interventions: the new Medical Research Council guidance. *British Medical Journal*, *337*.

Day-Vines, N. L., Booker Ammah, B., Steen, S., & Arnold, K. M. (2018). Getting comfortable with discomfort: Preparing counsellor trainees to broach racial, ethnic, and cultural factors with clients during counselling. *International Journal for the Advancement of Counselling*, 40, 89–104.

Department of Health. (2012). *The NHS Constitution for England*. Retrieved from https://www.gov.uk/government/publications/the-nhs-constitution-for-england

Hosseini, A., Kakuma, R., Ghazinour, M., Davern, M., Evans, W. P., & Minas, H. (2017). Migration experience, resilience and depression: a study of Iranian immigrants living in Australia. *International Journal of Culture and Mental Health*, *10*(1), 108-120.

Hasnain-Wynia, R., & Baker, D. W. (2006). Obtaining data on patient race, ethnicity, and primary language in health care organizations: current challenges and proposed solutions. *Health Services Research*, *41*(1), 1501-1518.

Huey Jr, S. J., Tilley, J. L., Jones, E. O., & Smith, C. A. (2014). The contribution of cultural competence to evidence-based care for ethnically diverse populations. *Annual review of Clinical Psychology*, *10*, 305-338.

Iqbal, G., Gumber, A., Johnson, M. R., Szczepura, A., Wilson, S., & Dunn, J. A. (2009). Improving ethnicity data collection for health statistics in the UK. *Diversity and Equality in Health and Care*, *6*(4), 267-285.

Iqbal, G., Johnson, M. R., Szczepura, A., Wilson, S., Gumber, A., & Dunn, J. A. (2012a). UK ethnicity data collection for healthcare statistics: the South Asian perspective. *BMC Public Health*, *12*(1), 1-9.

Iqbal, G., Johnson, M. R., Szczepura, A., Gumber, A., Wilson, S., & Dunn, J. A. (2012b). Ethnicity data collection in the UK: the healthcare professional's perspective. *Diversity and Equality in Health and Care*, *9*(4), 281-290.

King, K. M., & Summers, L. (2020). Predictors of broaching: Multicultural competence, racial color blindness, and interpersonal communication. *Counsellor Education and Supervision*, *59*(3), 216-230.

Maxie, A. C., Arnold, D. H., & Stephenson, M. (2006). Do therapists address ethnic and racial differences in cross-cultural psychotherapy? *Psychotherapy: Theory, Research, Practice, Training*, *43*, 85–98. https://doi.org/10.1037/0033-3204.43.1.85

Michie, S., Van Stralen, M. M., & West, R. (2011). The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implementation Science, 6*(1), 1-12.

Michie S., Atkins L. & West R. 2014. The behaviour Change Wheel: A Guide to Designing Interventions, 1st edn. London: Silverback.

Morgan, A., & Ziglio, E. (2007). Revitalising the evidence base for public health: an assets model. *Promotion & Education, 14*(2), 17-22.

Naz, S., Gregory, R., & Bahu, M. (2019). Addressing issues of race, ethnicity and culture in CBT to support therapists and service managers to deliver culturally competent therapy and reduce inequalities in mental health provision for BAME service users. *The Cognitive Behaviour Therapist, 12*. doi:10.1017/S1754470X19000060

National Institute for Health and Care Excellence. (2014). *Behaviour Change: Individual Approaches (PH49)*. Retrieved from: http://guidance.nice.org.uk/PH49

Truong, M., Paradies, Y., & Priest, N. (2014). Interventions to improve cultural competency in healthcare: a systematic review of reviews. *BMC Health Services Research, 14*(1), 1-17.

West, S., van Kerkhoff, L., & Wagenaar, H. (2019). Beyond "linking knowledge and action": towards a practice-based approach to transdisciplinary sustainability interventions. *Policy Studies, 40*(5), 534-555.

Wynia, M. K., Ivey, S. L., & Hasnain-Wynia, R. (2010). Collection of data on patients' race and ethnic group by physician practices. *The New England Journal of Medicine, 362*(9), 846 850.

Appendices

Appendix A

Search strategy

Name of database	Date of search from:	Date of search to:	Records retrieved
Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily	1946	05-04-2019	1258
Embase	1947	05-04-2019	1301
PsycINFO	1806	05-04-2019	441
HMIC Health Management Information Consortium	1979	01-01-2019	3

Update search results: June 2020

Name of database	Date of search from:	Date of search to:	Records retrieved
Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily	1946	30-06-20	112
Embase	1947	29-06-20	305
PsychINFO	1806	29-06-20	46
HMIC Health Management Information Consortium	1979	20-05-20	5

Update search: December 2020

Name of database	Date of search from:	Date of search to:	Records retrieved
Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily	1946	10-12-20	45
Embase	1947	10-12-20	206
PsychINFO	1806	20-11-20	32
HMIC Health Management Information Consortium	1979	20-11-20	0

MEDLINE; EMBASE; PSYCHINFO, HMIC (via Ovid)

1. randomized controlled trial.pt.
2. controlled clinical trial.pt.
3. randomized.ab.
4. placebo.ab.
5. clinical trials as topic.sh.
6. randomly.ab.

7. trial.ti.
8. 1 or 2 or 3 or 4 or 5 or 6 or 7
9. ((systematic adj review*) or meta analy* or metaanaly*).tw.
10. meta-analysis as topic/ or Meta-Analysis.pt.
11. 9 or 10
12. Epidemiologic studies/ or exp case control studies/ or exp cohort studies/ or Cross-sectional studies/
13. Case control.tw.
14. (cohort adj (study or studies)).tw.
15. Cohort analy$.tw.
16. (observational adj (study or studies)).tw.
17. 12 or 13 or 14 or 15 or 16
18. 8 or 11 or 17
19. comment/ or editorial/ or letter/
20. 18 not 19
21. exp Ethnic Groups/
22. exp Minority Groups/
23. ("BME" or "BAME" or "black asian and minority ethnic" or "black and minority ethnic" or "ethnic minorit*" or "asian minorit*").tw.
24. Asian Continental Ancestry Group/ or African Continental Ancestry Group/ or European Continental Ancestry Group/ or African Americans/ or Asian Americans/ or Hispanic Americans/
25. gypsies/
26. Roma/
27. (traveller$1 or Gypsies or Gypsy or Gipsy or Gipsies or Romany or Romanies or Romani or Romanis or Rromani or Rromanis or Roma).ti,ab.
28. "Transients and Migrants"/
29. "Emigration and Immigration"/
30. "Emigrants and Immigrants"/
31. refugees/
32. (immigrant$ or migrant$ or asylum or refugee$ or undocumented).ti,ab.
33. (displaced and (people or person$1)).ti,ab.
34. (born adj2 overseas).ti,ab.
35. exp Psychotherapy/
36. ("mental health care" or "mental healthcare" or "mental health intervention*" or "mental health treatment" or "mental health support" or "psychological therap*" or "psychological intervention" or "psychology intervention" or "psychological treatment" or "psychology support" or "psychological support").tw.
37. 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34
38. 35 or 36
39. 20 and 37 and 38
40. limit 39 to (humans and yr="1965 -Current")

ASSIA (via Proquest)

	Date of search from:	Date of search to:	Records retrieved
Original search	01-01-1965	06-04-2019	1083
Update search (June)	07-04-2019	30-06-2020	86
Update search (December)	30-06-2020	11-12-20	47

(MAINSUBJECT.EXACT.EXPLODE("Minority groups") OR MAINSUBJECT.EXACT.EXPLODE("Ethnic groups") OR TI,AB("Central Asian people") OR TI,AB("Asian Australian people") OR TI,AB("South East Asian American people") OR TI,AB("Asian American people") OR TI,AB("South East Asian people") OR TI,AB("East Asian people") OR TI,AB("Asian communities") OR TI,AB("Ugandan Asian people") OR TI,AB("Asian people") OR TI,AB("Asian-Pacific American people") OR TI,AB("South Asian people") OR TI,AB("Australasian people") OR TI,AB("Eurasian people") OR TI,AB("South Asian communities") OR TI,AB("Black Asian American people") OR TI,AB("Gypsies") OR TI,AB("Immigrants") OR TI,AB("Migrants") OR TI,AB("Emigrants") OR TI,AB("Refugees") OR TI,AB("Asylum") OR TI,AB("Immigration") OR ti,ab("BAME" OR "BME" OR "black asian and minority ethnic" OR "black and minority ethnic" OR ethnic minorit* OR asian minorit* OR minorit* OR travel?er*1 OR Gypsies OR Gypsy OR Gipsies OR Romany OR Romani OR Romanis OR Rromanis OR Roma OR immigrant*1 OR migrant*1 OR refugee*1 OR undocumented OR displaced people OR displaced person*1 OR born overseas)) AND (MAINSUBJECT.EXACT.EXPLODE("Psychotherapy") OR ti,ab(psychotherapy OR cognitive behavio?ral therapy OR "CBT" OR mental health care OR mental health OR mental healthcare OR mental health intervention OR mental health treatment OR mental health support OR psychological therap* OR psychological intervention OR psychology intervention OR psychological treatment OR psychology support OR psychological support)) AND (TI,AB("Meta-analysis") OR TI,AB("Cohort analysis") OR TI,AB("Cross-sectional studies") OR TI,AB("Observational research") OR TI,AB("Randomized controlled trials") OR TI,AB("Systematic reviews") OR ti,ab(systematic NEAR/4 review*) OR meta analy* OR metaanaly* OR randomized controlled trial OR controlled clinical trial OR randomized OR placebo OR randomly OR trial OR Case control OR (cohort NEAR/4 (study OR studies)) OR Cohort analy OR (Follow up NEAR/4 (study OR studies)) OR (observational NEAR/4 (study OR studies))) AND PEER(yes)

CINAHL Database (via EBSCO)

	Date of search from:	Date of search to:	Records retrieved
Original search	01-01-1965	07-04-19	721
Update search (June)	08-04-19	30-06-20	140
Update search (December)	01-07-20	11-12-20	42

#	Query	Limiters/Expanders	Last Run Via	Results
S1	MH (MH "Minority Groups+") OR (MH "Ethnic Groups+")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus	133,338
S2	MW ethnic minorities OR MW (black, asian and minority ethnic (bame)) OR MW (bme or black minority ethnic or ethnic or african or caribbean) OR MW asian american OR MW (african americans or black americans or blacks) OR MW (hispanic or latino or latina or mexican or central american or south american or hispanics or latin) OR MW (gypsy or roma or traveller) OR MW (migrants or immigrants or asylum seekers or refugees) OR MW (emigration or immigration or migration) OR MW emigrants OR MW displaced persons	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus	109,594
S3	(MH psychotherapy+)	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus	163,340
S4	MW "psychotherapy" OR "cognitive behavio#ral therapy" OR "CBT" OR "mental health care" OR "mental health" OR "mental healthcare" OR "mental health	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen -	149,052

	intervention" OR "mental health treatment" OR "mental health support" OR "psychological therap?" OR "psychological intervention" OR "psychology intervention" OR “psychological treatment" OR "psychology support" OR "psychological support"		Advanced Search Database - CINAHL Plus	
S5	MW (randomized controlled trials or rtc or randomised control trials) OR MW (meta-analysis or systematic review) OR MW cohort design study OR MW observational research	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus	163,891
S6	MW “systematic review*” OR “meta analy*” OR “metaanaly*” OR “randomized controlled trial” OR “controlled clinical trial” OR “randomized” OR “placebo” OR “randomly” OR “trial” OR “Case control“ OR “cohort stud*” OR “Cohort analy*” OR “Follow up stud*” OR “observational stud*”	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus	235,668
S7	S1 OR S2	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus	157,262
S8	S3 OR S4	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus	271,573
S9	S5 OR S6	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus	235,668

S10	S7 AND S8 AND S9	Limiters - Published Date: 19650101-20190431; Human Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL Plus	721

CENTRAL (via Wiley)

	Date of search from:	Date of search to:	Records retrieved
Original search	01-01-1965	29-04-19	877
Update search (June)	30-04-19	30-06-20	8
Update search (December)	01-07-20	11-12-20	0

ID Search
#1 MeSH descriptor: [Ethnic Groups] explode all trees
#2 MeSH descriptor: [Minority Groups] explode all trees
#3 MeSH descriptor: [Asian Continental Ancestry Group] this term only
#4 MeSH descriptor: [African Continental Ancestry Group] this term only
#5 MeSH descriptor: [European Continental Ancestry Group] this term only
#6 MeSH descriptor: [African Americans] this term only
#7 MeSH descriptor: [Asian Americans] this term only
#8 MeSH descriptor: [Hispanic Americans] this term only
#9 MeSH descriptor: [Roma] this term only
#10 MeSH descriptor: [Transients and Migrants] this term only
#11 MeSH descriptor: [Emigration and Immigration] this term only
#12 MeSH descriptor: [Emigrants and Immigrants] this term only
#13 MeSH descriptor: [Refugees] this term only
#14 ("BAME"):ti,ab,kw OR ("BME"):ti,ab,kw OR ("black asian and minority ethnic"):ti,ab,kw OR ("black and minority ethnic"):ti,ab,kw OR ("minority group"):ti,ab,kw (Word variations have been searched) with Publication Year from 1965 to 2019, with Cochrane Library publication date Between Jan 1965 and Apr 2019, in Trials
#15 ("traveller"):ti,ab,kw OR ("travellers"):ti,ab,kw OR ("Gypsies"):ti,ab,kw OR ("Gypsy"):ti,ab,kw OR ("Romany"):ti,ab,kw (Word variations have been searched) with Publication Year from 1965 to 2019, with Cochrane Library publication date Between Jan 1965 and Apr 2019, in Trials
#16 ("displaced people"):ti,ab,kw OR ("displaced person"):ti,ab,kw (Word variations have been searched) with Publication Year from 1965 to 2019, with Cochrane Library publication date Between Jan 1965 and Apr 2019, in Trials
#17 ("refugees"):ti,ab,kw OR ("asylum"):ti,ab,kw OR ("undocumented"):ti,ab,kw OR ("immigrant"):ti,ab,kw OR ("migrant"):ti,ab,kw (Word variations have been searched) with Publication Year from 1965 to 2019, with Cochrane Library publication date Between Jan 1965 and Apr 2019, in Trials
#18 MeSH descriptor: [Psychotherapy] explode all trees
#19 ("mental health care"):ti,ab,kw OR ("mental healthcare"):ti,ab,kw OR ("mental health intervention"):ti,ab,kw OR ("mental health treatment"):ti,ab,kw OR ("mental health support"):ti,ab,kw (Word variations have been searched) with Publication Year from 1965 to 2019, with Cochrane Library publication date Between Jan 1965 and Apr 2019, in Trials
#20 ("psychology intervention"):ti,ab,kw OR ("psychological treatment"):ti,ab,kw OR ("psychological therapies"):ti,ab,kw OR ("psychology support"):ti,ab,kw OR ("psychological support"):ti,ab,kw (Word variations have been searched) with Publication Year from 1965 to 2019, with Cochrane Library publication date Between Jan 1965 and Apr 2019, in Trials

#21 ("psychological therapy"):ti,ab,kw OR ("psychological therapies"):ti,ab,kw OR ("psychological intervention"):ti,ab,kw OR ("psychology intervention"):ti,ab,kw OR ("psychological treatment"):ti,ab,kw (Word variations have been searched) with Publication Year from 1965 to 2019, with Cochrane Library publication date Between Jan 1965 and Apr 2019, in Trials
#22 #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 #OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 with Publication Year from 1965 to 2019, with Cochrane Library publication date Between Jan 1965 and Apr 2019, in Trials
#23 #18 OR #19 OR #20 OR #21 with Publication Year from 1965 to 2019, with Cochrane Library publication date Between Jan 1965 and Apr 2019, in Trials
#24 #22 AND #23 with Publication Year from 1965 to 2019, with Cochrane Library pub lication date Between Jan 1965 and Apr 2019, in Trials

CDSR (via Wiley)

Name of database	Date of search from:	Date of search to:	Records retrieved
Original search	01-01-1965	29-04-19	6
Update search (June)	30-04-19	30-06-20	1
Update search 2 (December)	01-07-20	11-12-20	0

ID Search
#1 MeSH descriptor: [Ethnic Groups] explode all trees
#2 MeSH descriptor: [Minority Groups] explode all trees
#3 MeSH descriptor: [Asian Continental Ancestry Group] this term only
#4 MeSH descriptor: [African Continental Ancestry Group] this term only
#5 MeSH descriptor: [European Continental Ancestry Group] this term only
#6 MeSH descriptor: [African Americans] this term only
#7 MeSH descriptor: [Asian Americans] this term only
#8 MeSH descriptor: [Hispanic Americans] explode all trees
#9 MeSH descriptor: [Roma] this term only
#10 MeSH descriptor: [Transients and Migrants] this term only
#11 MeSH descriptor: [Emigration and Immigration] this term only
#12 MeSH descriptor: [Emigrants and Immigrants] explode all trees
#13 MeSH descriptor: [Refugees] explode all trees
#14 ("BAME"):ti,ab,kw OR ("BME"):ti,ab,kw OR ("black asian and minority ethnic"):ti,ab,kw OR ("black and minority ethnic"):ti,ab,kw OR ("minority group"):ti,ab,kw with Cochrane Library publication date Between Jan 1965 and Apr 2019, in Cochrane Reviews (Word variations have been searched)
#15 ("traveller"):ti,ab,kw OR ("travellers"):ti,ab,kw OR ("Gypsies"):ti,ab,kw OR ("Gypsy"):ti,ab,kw OR ("Romany"):ti,ab,kw with Cochrane Library publication date Between Jan 1965 and Apr 2019, in Cochrane Reviews (Word variations have been searched)
#16 ("displaced people"):ti,ab,kw OR ("displaced person"):ti,ab,kw with Cochrane Library publication date Between Jan 1965 and Apr 2019, in Cochrane Reviews (Word variations have been searched)
#17 ("refugees"):ti,ab,kw OR ("asylum"):ti,ab,kw OR ("undocumented"):ti,ab,kw OR ("immigrant"):ti,ab,kw OR ("migrant"):ti,ab,kw with Cochrane Library publication date Between Jan 1965 and Apr 2019, in Cochrane Reviews (Word variations have been searched)
#18 MeSH descriptor: [Psychotherapy] explode all trees
#19 ("mental health care"):ti,ab,kw OR ("mental healthcare"):ti,ab,kw OR ("mental health intervention"):ti,ab,kw OR ("mental health treatment"):ti,ab,kw OR ("mental health support"):ti,ab,kw with Cochrane Library publication date Between Jan 1965 and Apr 2019, in Cochrane Reviews (Word variations have been searched)
#20 ("psychology intervention"):ti,ab,kw OR ("psychological treatment"):ti,ab,kw OR ("psychological therapies"):ti,ab,kw OR ("psychology support"):ti,ab,kw OR ("psychological support"):ti,ab,kw with Cochrane Library publication date Between Jan 1965 and Apr 2019, in Cochrane Reviews (Word variations have been searched)

#21 ("psychological therapy"):ti,ab,kw OR ("psychological therapies"):ti,ab,kw OR ("psychological intervention"):ti,ab,kw OR ("psychology intervention"):ti,ab,kw OR ("psychological treatment"):ti,ab,kw with Cochrane Library publication date Between Jan 1965 and Apr 2019, in Cochrane Reviews (Word variations have been searched)
#22 #1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 #OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15 OR #16 OR #17 with Cochrane Library publication date Between Jan 1965 and Apr 2019, in Cochrane Reviews (Word variations have been searched)
#23 #18 OR #19 OR #20 OR #21 with Cochrane Library publication date Between Jan 1965 and Apr 2019, in Cochrane Reviews (Word variations have been searched)
#24 #22 AND #23 with Cochrane Library publication date Between Jan 1965 and Apr 2019, in Cochrane Reviews (Word variations have been searched)

Appendix B

Categorisation of study labels

TableB.1

Categorisation of Problem Descriptor

Label	Problem descriptor as reported in studies
Depression	Depression; major depressive disorder; peri/post-natal depression; depressive symptoms
Anxiety	Anxiety; anxiety symptoms; generalised anxiety disorder (GAD); panic disorder; panic symptoms; panic attack; phobia
Post-traumatic stress disorder (PTSD)	PTSD; PTSD symptoms; trauma; trauma symptoms
Psychosis	Psychosis; first-episode psychosis; schizophrenia; psychotic symptoms; positive symptoms; negative symptoms
Eating disorder	Binge eating disorder
Mental health problem not otherwise specified (NOS)	Mental health problem(s) NOS; general mental health

Table B.2

Categorisation of target population

Target population/group	Included in population group
Latino	Latino; Latina; Hispanic (Puerto Rican)
Black or mixed race	African; African American; African British; Black African; Black Caribbean; "Black"; mixed race Black African or Caribbean
East Asian	East Asian; Asian (Chinese, Korean, Japanese, Vietnamese)
South Asian	South Asian; Asian (Indian; Pakistani; Bangladeshi; Sri Lankan)
BAME NOS/mixed groups/immigrants/migrants	"racial/ethnic diverse" “immigrants” “migrants” or no other info; mixed ethnic/racial groups
Middle Eastern	Middle Eastern; Arabian
Religious minority	Jewish; Muslim
Refugees/Asylum seekers	Refugees; asylum seekers; displaced people

BAME = Black, Asian and minority ethnic; NOS = not otherwise specified

Appendix C

The Cochrane Risk of Bias Tool

Table C.1

Cochrane Risk of Bias Tool (Higgins et al., 2011)

Domain	Description	Review authors' judgement (assess as low, unclear or high risk of bias)
Sequence generation.	Described the method used to generate the allocation sequence in sufficient detail to allow an assessment of whether it should produce comparable groups.	Selection bias (biased allocation to interventions) due to inadequate generation of a randomised sequence
Allocation concealment.	Described the method used to conceal the allocation sequence in sufficient detail to determine whether intervention allocations could have been foreseen in advance of, or during, enrolment.	Selection bias (biased allocation to interventions) due to inadequate concealment of allocations before assignment
Blinding of participants, personnel and outcome assessors *Performing bias*	Described all measures used, if any, to blind study participants and personnel from knowledge of which intervention a participant received. Provide any information relating to whether the intended blinding was effective.	Performance bias due to knowledge of the allocated interventions by participants and personnel during the study.
Blinding (outcome assessment) *Detection bias*	Described all measures used, if any, to blind outcome assessors from knowledge of which intervention a participant received. Provided any information relating to whether the intended blinding was effective.	Detection bias due to knowledge of the allocated interventions by outcome assessment
Incomplete outcome data *Attrition Bias*	Described the completeness of outcome data for each main outcome, including attrition and exclusions from the analysis. State whether attrition and exclusions were reported, the numbers in each intervention group (compared with total randomized participants), reasons for attrition/exclusions where reported, and any re-inclusions in analyses performed by the review authors.	Attrition bias due to amount, nature, or handling of incomplete outcome data

Table C.1

Cochrane Risk of Bias Tool (Higgins et al., 2011)

Domain	**Description**	**Review authors' judgement (assess as low, unclear or high risk of bias)**
Selective reporting *Reporting bias*	Stated how the possibility of selective outcome reporting was examined by the review authors, and what was found.	Reporting bias due to selective outcome reporting
Other sources of bias.	Stated any important concerns about bias not addressed in the other domains in the tool. If particular questions/entries were pre-specified in the review's protocol, responses should be provided for each question/entry.	Bias due to problems not covered elsewhere

Table C.2

Risk of Bias Assessment for Primary Studies (K= 18)

	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding of participants and personnel (performance bias)	Blinding of outcome assessment (detection bias)	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Overall
Acarturk et al. (2016)	Low. Random number generator (computerised)	Low	Unclear. Not blind.	Low. Blinded	Low. Both ITT and completer analysis used.	Unclear. Protocol not accessible.	Low
Beeber et al. (2010)	Low. Random number generator (computerised)	Unclear. Not reported	Unclear. Not blind.	Low. Blinded	Unclear. Completer analysis	Unclear. Protocol not accessible.	Low
Choy et al. (2016)	Low. Reported 'randomly allocated'; methods unknown	Unclear. Not reported	Low. Blinded	Low. Blinded	Unclear. Completer analysis	Unclear. Protocol not accessible.	Low
Collado et al. (2016)	Low. Random number generator (computerised)	Unclear. Not reported	Unclear. Not blind.	Unclear. Not blind.	Low. ITT analysis	Unclear. Protocol not accessible.	Low
De Graaf et al. (2020)	Low. Random number generator (computerised)	Low	Low. Blinded	Low. Blinded	Low. ITT analysis	Low. Protocol accessed and checked.	Low

Table C.2 (continue)

Risk of Bias Assessment for Primary Studies (K= 18)

Study ID	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding of participants and personnel (performance bias)	Blinding of outcome assessment (detection bias)	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Overall
Dwight-Johnson et al. (2011)	Low. Permuted block randomization	Low	Unclear. Not blind	Unclear. Not reported.	Low. ITT analysis	Low. Protocol accessed and checked.	Low
Feldman et al. (2016)	Low. Random number generator (computerised)	Unclear. Not reported	Low. Blinded	Low. Blinded	Low. ITT analysis	Low. Protocol accessed and checked.	Low
Gonyea et al. (2016)	Low. Permuted block randomisation	Unclear. Not reported	Unclear. Not blind	Unclear. Not reported.	Low. ITT analysis	Unclear. Protocol not accessible.	Unclear
Grote et al. (2009)	Low. Permuted block randomisation	Unclear. Not reported	Unclear. Not blind	Unclear. Not reported.	Low. ITT analysis	Unclear. Protocol not accessible.	Unclear
Hendricks et al. (2020)	Low. Random number generator (computerised)	Low	Unclear. Not blind	Low. Blinded	Low. ITT analysis	Low. Protocol accessed and checked.	Low
Hinton et al. (2011)	Low. Reported 'randomly allocated’	Unclear. Not reported	Unclear. Not blind	Unclear. Not reported.	No missing data	Unclear. Protocol not accessible.	Unclear

Table C.2 (continue)

Risk of Bias Assessment for Primary Studies (K= 18)

Study ID	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding of participants and personnel (performance bias)	Blinding of outcome assessment (detection bias)	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Overall
Laperriere et al. (2005)	Low. Reported 'randomly allocated'	Unclear. Not reported	Unclear. Not blind	Unclear. Not reported.	Low. ITT analysis	Unclear. Protocol not accessible.	Unclear
Muto et al. (2011)	Low. Random number generator (computerised)	Unclear. Not reported	Low. Blinded	Unclear. Not reported.	Low. ITT analysis	Unclear. Protocol not accessible.	Low
Rosmarin et al. (2010)	Low. Random number generator (computerised)	Unclear. Not reported	Low. Blinded	Low. Blinded	Low. ITT analysis	Unclear. Protocol not accessible.	Low
Rathod et al. (2013)	Low. Random number generator (computerised)	Unclear. Not reported	Low. Blinded.	Low. Blinded	Low. ITT analysis	Low. Protocol accessed and checked.	Low
Shaw et al. (2018)	Low. Random number generator (computerised)	Unclear. Not reported	Unclear. Not blind	Unclear. Not blind.	Low. ITT analysis	Unclear. Protocol not accessible.	Unclear
So et al. (2015)	Low. Reported 'randomly allocated'	Unclear. Not reported	Unclear. Not blind	Low. Blinded	Low. ITT analysis	Unclear. Protocol not accessible.	Low
Tol et al. (2020)	Low. Random number generator (computerised)	Low	Unclear. Not blind	Low. Blinded	Low. ITT analysis	Low. Protocol accessed and checked.	Low

Appendix D

Study characteristics

Table D.1

Characteristics of included RCTs (K=18)

Study ID	Country	Population	Baseline (*N*)	Gender (female)	Intervention type	Target condition	Primary outcome measure(s)	Treatment format	Number of sessions (minutes per session)	Follow-up (mths)
Acarturk et al. (2016)	Turkey	Killis refugees	98	74.50%	Eye movement desensitization reprocessing	PTSD	HTQ	Individual	7 (90)	1
Beeber et al. (2010)	USA	Latino	80	100%	Interpersonal Therapy	Depression	CES-D	Individual	16 (90)	1
Choy et al. (2016)	Hong Kong	East Asian	114	65%	Instrumental Reminiscence Intervention - Hong Kong	Depressive symptoms	GDS-15 (Chinese version)	Group	6 (90)	1.5
Collado et al. (2016)	USA	Latino	46	80.43%	Behavioural activation	MDD	BDI-II	Individual	10 (90)	1
De Graaf et al. (2020)	Netherlands	Syrian refugees	60	60%	Problem Management Plus	Depression; Anxiety	HSCL-25 (depression and anxiety subscale)	Individual	5 (90)	3

Note. NR = not reported, MDD = major depressive disorder; PTSD = post-traumatic stress disorder; Checklist; CES-D = Centre for Epidemiological Studies Depression Scale; HSCL = Hopkins Symptom; HTQ = Harvard Trauma Questionnaire; BDI = Beck Depression Inventory.

Table D.1 (continue)

Characteristics of included RCTs (K=18)

Study ID	Country	Population	Baseline (*N*)	Gender (female)	Intervention type	Target condition	Primary outcome measure (s)	Treatment format	Number of sessions (minutes per session)	Follow-up (mths)
Dwight-Johnson et al. (2011)	USA	Latino	101	79%	CA-CBT (telephone)	Depression	PHQ-9	Individual	8 (50)	6
Feldman et al. (2016)	USA	Latino	48	100%	Cognitive Behaviour Psychophysiological Therapy	Panic Disorder	PDSS	Group	8 (NR)	3
Gonyea et al. (2016)	USA	Latino	78	79.10%	CA-CBT	Depression; Anxiety	CES-D	Group	5 (90)	3
Grote et al. (2009)	USA	BAME NOS	53	100%	Enhanced brief IPT	Perinatal depression	EPDS	Individual	8 (NR)	6
Hendricks et al. (2020)	Suriname	Black/mixed race	158	60%	Positive Psychology	Depression; Anxiety	DASS-21	Individual	6 (180)	3
Hinton et al. (2011)	USA	Latino	24	100%	CA-CBT	PTSD	PTSD-CL	Group	14 (60)	3

Note. NOS = not otherwise specified; CA-CBT = Culturally Adapted-Cognitive Behaviour Therapy; IPT = interpersonal psychotherapy; PTSD = post-traumatic stress disorder; NR = not reported/not found; CES-D = Centre for Epidemiological Studies Depression Scale; DASS-21= Depression Anxiety Stress Scale; EPDS = Edinburgh Perinatal Depression Scale; HTQ = Harvard Trauma Questionnaire; HSCL = Hopkins Symptom Checklist; PHQ = Patient health questionnaire; PTSD-CL = PTSD checklist; PDSS = post-traumatic stress diagnostic scale

Table D.1 (continue)

Characteristics of included RCTs (K=18)

Study ID	Country	Population	Baseline (*N*)	Gender (female)	Intervention type	Target condition	Primary outcome measure(s)	Treatment format	Number of sessions (minutes per session)	Follow-up (mths)
Laperriere et al. (2005)	USA	BAME NOS	154	100%	CBT stress management	Depression	BDI	Group	10 (120)	12
Muto et al. (2011)	USA	East Asian	70	62.85%	Acceptance and commitment therapy	Depression, Anxiety	GHQ-12	Individual (guided self-help)	NA (self-directed)	2
Rosmarin et al. (2010)	UK	BAME NOS	NR	NR	CA-CBT psychosis	Schizophrenia	CPRS (total)	Individual	16 (40)	6
Rathod et al. (2013)	USA	Religious minority	83	69.40%	Internet based Spiritually Integrated Treatment Psychotherapy	Anxiety	PSWQ	Individual	NA (self-directed)	1.5 -2

Note. NOS = not otherwise specified; CBT = cognitive behavioural therapy; CA-CBT = Culturally Adapted-CBT; NR = not reported/not found; BDI = Beck Depression Inventory; CPRS = Comprehensive Psychopathological Rating Scale; GHQ-12 =General Health Questionnaire; PSWQ = Penn State Worry Questionnaire.

Table D.1 (continue)

Characteristics of included RCTs (K=18)

Study ID	Country	Population	Baseline (*N*)	Gender (female)	Intervention type	Target condition	Primary outcome measure(s)	Treatment format	Number of sessions (minutes per session)	Follow-up (mths)
Shaw et al. (2018)	Malaysia	Middle Easters refugees	29	100%	CA-CBT	Depression & Anxiety	HSCL-25 (depression)	Group	8 (60)	3
So et al. (2015)	Hong Kong	East Asian	44	45.50%	Meta cognitive training for delusions	Schizophrenia	PSYRATS (delusions)	Individual	4 (60)	1
Tol et al. (2020)	Uganda	Sudanese refugees	694	100%	Self-help PLUS based on ACT	Mental health NOS	Kessler-6	Group	5 (120)	3

Note. NOS = not otherwise specified; ACT = Acceptance and Commitment Therapy; CA-CBT = Culturally Adapted-Cognitive Behaviour Therapy; IPT = interpersonal psychotherapy; HSCL = Hopkins Symptom Checklist; PSYRATS = Psychotic Symptom Rating Scales.

Appendix E

Sensitivity Analyses

Table E.1
Sensitivity Analyses

	Sensitivity Analysis				Main Analysis[a]			
Strategy	*K* (comparison)	Hedges' g (CI)	p	I^2	K (comparison)	Hedges' g (CI)	*p*	I^2
Remove Dwight Johnson et al. (2011)	17(21)	0.54 (-0.78, -0.30)	<.001	80.99%.				
Remove 1 year follow-upa	16 (17)	-0.54 (-0.80 -0.28)	<.001	80.73%	17 (20)	-0.54(-0.78, -0.30)	<.001	80.56%
Remove unclear risk of biasa	12 (14)	-0.61 (-0.91, -0.30)	<.001	83.40%				

Note. [a] = Sensitivity analyses compared to meta-analysis of all included studies at follow-up.

Table E.2
Sensitivity Analysis

Strategy	Sensitivity analysis				Main Analysis [a]			
Remove self-help intervention	3(5)	-0.62 (-1.11, -0.14]	.001	77.08	5 (7)	-0.63(-1.11, 0.14)	.011	78.90%

Note. [a] Sensitivity analyses compared to common factor therapeutic-relationship adaptation at follow-up.

Appendix F

Forest Plots

Figure F .1

Forest plot of all primary studies (K = 18)

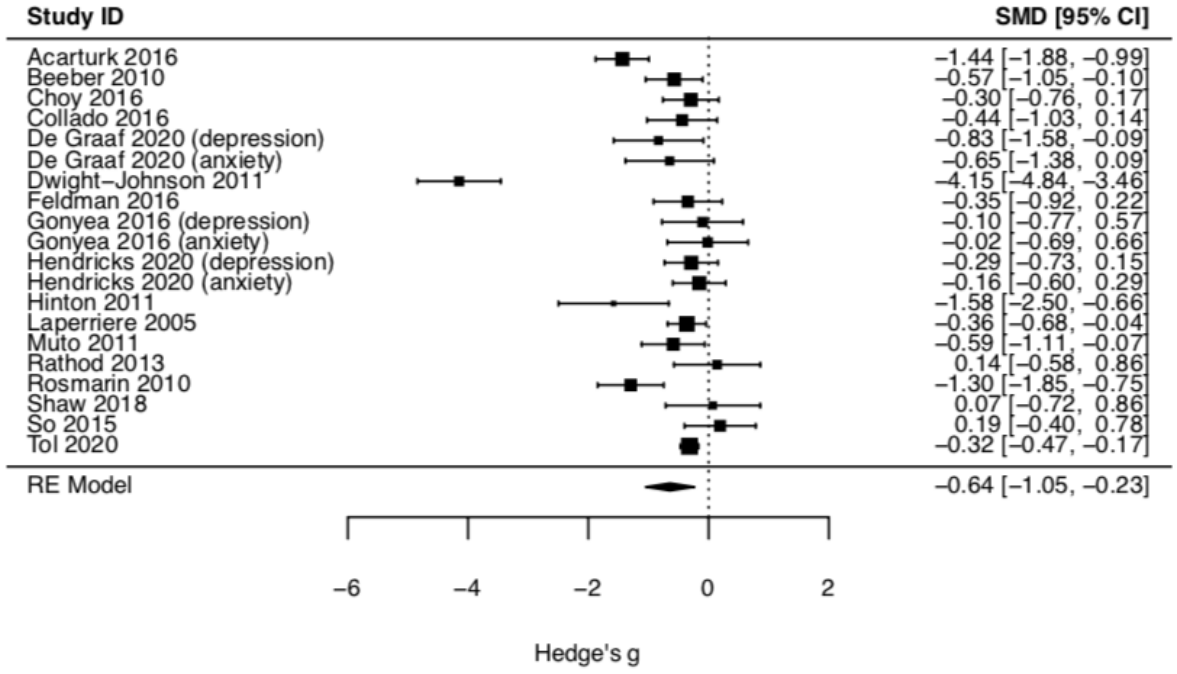


Figure F.2

Forest plot of all included studies after sensitivity analysis (K = 17)

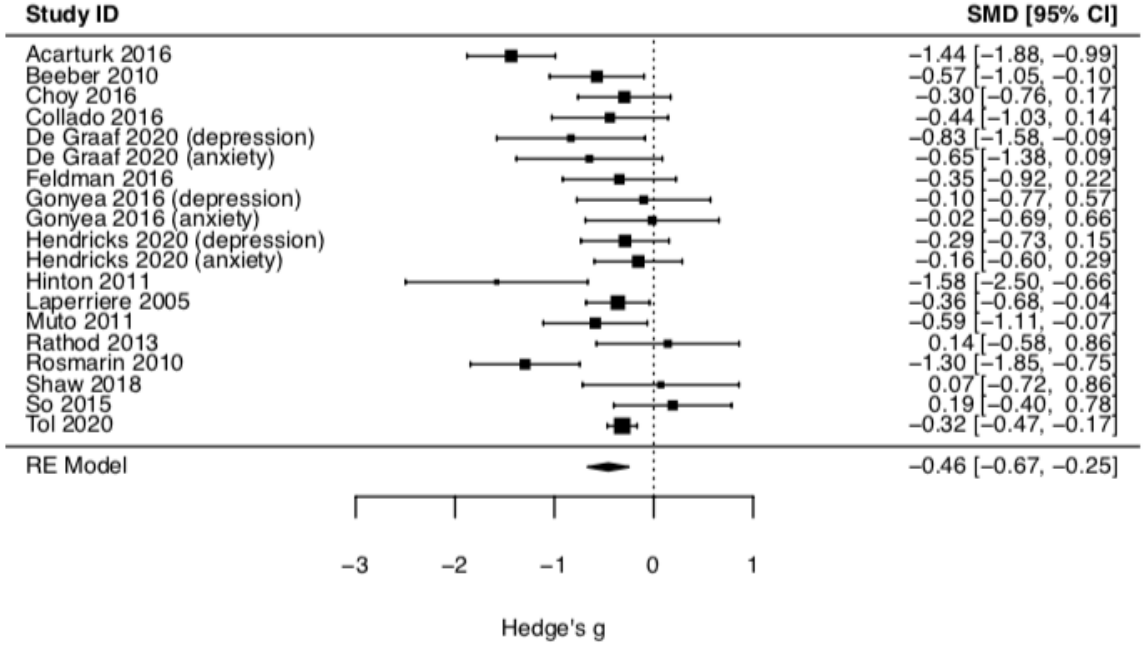


Figure F.3

Forest plot of subsample of studies (less than 3-months follow-up)

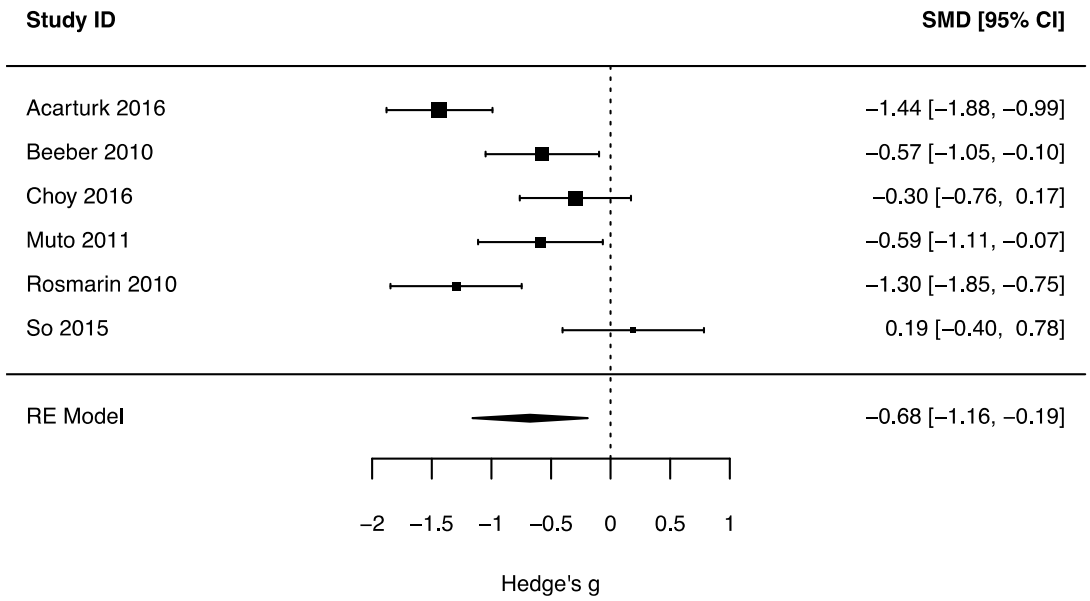
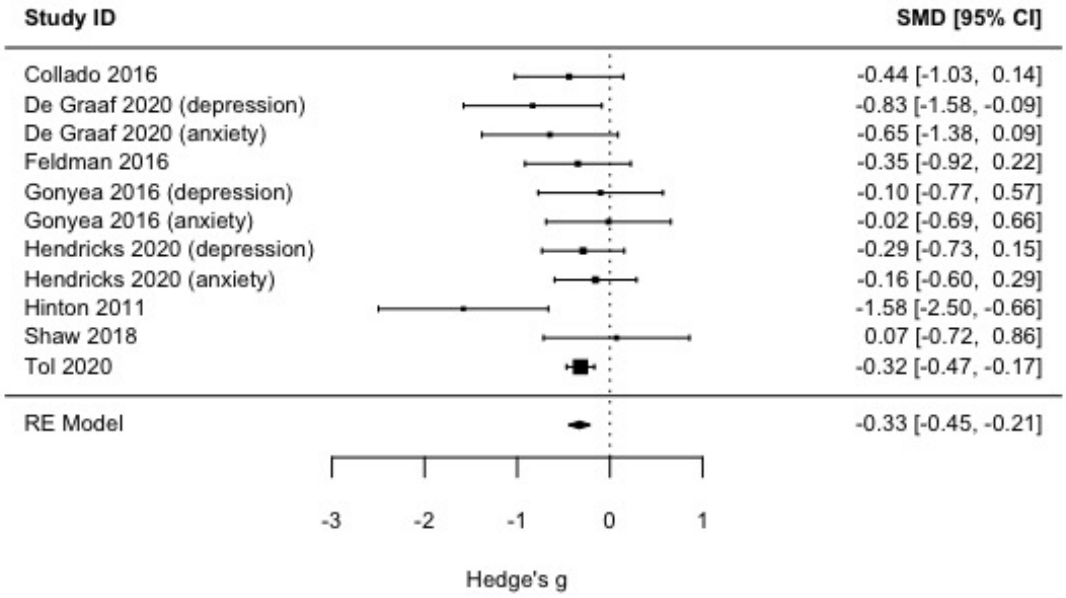


Figure F.4

Forest plot of the subsample of studies (3-months follow-up)



Appendix G

Target Population

Table G.1
Number of RCTs targeting BAME groups

Target population/group	Number of studies (K)	Study IDs
East Asian	3	Choy et al. (2016); Muto (2011); So (2015)
Latino	5	Beeber (2010); Collado (2016); Feldman (2016); Gonyea (2016); Hinton (2011); Dwight-Johnson (2011)
Refugees/asylum seekers	4	Acarturk (2016); De Graaf (2020); Shaw (2018) *; Tol (2020)
Black or mixed race	1	Hendricks (2020)
NOS/mixed groups	3	Laperriere (2005); Grote (2009); Rathod (2013);
Religious minority	1	Rosmarin (2010)
Middle Eastern	1	Shaw (2018)

Table G.2

Meta-analyses of adapted interventions for different target populations

Target population	Time point	K (comparisons)	Hedge's g (95% CI)	p	I^2
Latinx	Post-intervention	5(6)	-0.40(-0.83, 0.02)	.0659	64.06%
	Follow-up	5(6)	-0.22(-0.66, -0.23)	0.340	36.45%
Refugees or asylum seekers	Post-intervention	4(5)	-1.03(-1.53, -0.54)	<.0001	77.88%
	Follow-up	4(5)	-0.65(-1.16, -0.14)	.013	81.40%

Appendix H

Adaptation Types

Table H.1

Adaptations applied to all studies (K=18)

Study ID	Adaptation area	Specific adaptation types	Common factors: Acceptability & suitability	Common factors: Therapeutic relationship	Common factors details reported by studies
Acarturk 2016	*Therapist-related*	Language translation			
	Content-related	Cultural	Cultural adaptations; Education		Culturally sensitive; Involved religious leaders to psychoeducate the community
	Organisation-specific	Time or length of treatment			
	Organisation-specific				
Beeber 2010	*Therapist-related*	Training for provider; Language translation		Alliance	Reported that specific considerations to the development of therapeutic relationship, no further details given
	Content-related	Cultural	Cultural adaptations		
	Organisation-specific	Location of treatment			
Choy 2016	*Therapist-related*			Alliance; Empathy	Pre-intervention interview to establish rapport; Observer assisted therapist to help participants nurture behavioural and emotional concerns
	Content-related	Cultural	Cultural adaptations; Preparation of the patient		Incorporated cultural leanings of the Chinese culture and culturally appropriate homework materials
	Organisation-specific	Form used to provide treatment; Location of treatment			

Table H.1 (continue)

Adaptations applied to all studies (K=18)

Study ID	Adaptation area	Specific adaptation types	Common factors: Acceptability & suitability	Common factors: Therapeutic relationship	Common factors details
Collado 2016	*Therapist-related*	Language translation			
	Content-related	Language translation			
	Organisation-specific				
De Graaff 2020	*Therapist-related*	Provider of treatment (peers); Training for provider; Language translation		Alliance	Peer provided to support alliance
	Content-related	Cultural	Cultural adaptation		'Culturally adapted', no further details given
	Organisation-specific				
Dwight-Johnson 2011	*Therapist-related*	Language translation; Provider of treatment (ethnic match)		Alliance	
	Content-related	Cultural; language translation	Cultural adaptations; Treatment structure		
	Organisation-specific	Location of treatment; Form used to provide treatment (phone); Method of access; Time of length of treatment			

Table H.1 (continue)

Adaptations applied to all studies (K=18)

Study ID	Adaptation area	Specific adaptation types	Common factors: Acceptability & suitability	Common factors: Therapeutic relationship	Common factors details
Feldman 2016	*Therapist-related*	Training for provider; Language translation			
	Content-related	Cultural	Cultural adaptations		'Modified treatment content to address culture'
	Organisation-specific				
Gonyea 2016	*Therapist-related*	Language translation		Alliance	
	Content-related	Cultural	Cultural adaptations		
	Organisation-specific	Location of treatment			
Grote 2009	*Therapist-related*			Agreement of treatment goals; Alliance	Collaborative problem solving of identified barriers to care; Trust-building
	Content-related	Cultural	Cultural adaptations; Treatment structure		Culturally relevant modifications, terminology, metaphors.
	Organisation-specific	Time or length of treatment; Location of treatment			

Table H.1 (continue)

Adaptations applied to all studies (K=18)

Hendriks 2020	*Therapist-related*	Training for provider/facilitator		
	Content-related	Cultural; Religious/faith-based	Cultural adaptations; Treatment structure; Education	Adaptation process clearly described; treatment content made to better suit target population; Psychoeducation elements
	Organisation-specific	Time or length of treatment		
Hinton 2020	*Therapist-related*	Language translation		
	Content-related	Cultural	Cultural adaptations; Education	Culturally relevant analogies used for imagery, and visualisation exercises, Education about PTSD using culturally appropriate explanations
	Organisation-specific			
Laperriere 2005	*Therapist-related*			
	Content-related	Cultural	Cultural adaptations	Culturally relevant metaphors and explanation
	Organisation-specific	Form used to provide treatment		
Muto 2011	*Therapist-related*			
	Content-related	Language translation; Cultural	Cultural adaptations	Culturally relevant metaphors and explanation
	Organisation-specific			
Rathod 2013	*Therapist-related*			
	Content-related	Cultural; Training for provider/facilitator	Cultural adaptations	Culturally relevant illness belief and help-seeking beliefs
	Organisation-specific			

Table H.1 (continue)

Adaptations applied to all studies (K=18)

Rosmarin 2010	*Therapist-related*			
	Content-related	Cultural; Religious/faith-based	Cultural adaptations; Preparation of the patient	Content-related is adapted in line with Jewish folktales; pre-intervention session to build rapport
	Organisation-specific			
Shaw 2018	*Therapist-related*	Provider of treatment; Training for provider/facilitator		
	Content-related	Cultural	Cultural adaptations; Education	Use of culturally and religiously appropriate symbols and imagery; Psychoeducation on trauma and emotion
	Organisation-specific	Medium used to provide treatment; Time or length of treatment		
So 2015	*Therapist-related*	Language translation		
	Content-related	Cultural; Language translation	Cultural adaptations	Use of culturally appropriate examples and metaphors familiar to the HK Chinese population
	Organisation-specific			
Tol 2020	*Therapist-related*	Training for provider/facilitator; Provider of treatment (layperson); Language translation		
	Content-related	Language translation	Education	Psychoeducation and engagement elements
	Organisation-specific	Medium used to provide treatment (self-help, group); Method of access (rapid)		

Appendix I

Meta-regressions

Table I.1

Single predictor meta-regression – type of control group

K	Variable	Coefficient	SE	p-value	95% CI	R^2
20	Waitlist/no intervention [a]	-0.022	.230	.924	-0.48, 0.43	0.00%

[a] *reference category = active control*

Table I.2

Length of follow-up meta-regression

K	Variable	Coefficient	SE	p-value	95% CI	R^2
20	1 to 2 months	-0.218	.276	.430	-0.19, 0.32	0.00%
	More than 5 months [a]	-0.071	.302	.814	-0.66, 0.52	

[a] *reference category = 2 to 5 months*

Table I.3

Single predictor meta-regression – risk of bias

K	Variable	Coefficient	SE	p-value	95% CI	R^2
20	Risk of bias [a]	0.266	0.256	.299	-0.22, 0.77	0.00%

[a] *reference category = low risk*

Table I.4

Single predictor meta-regression – format

K	Variable	Coefficient	SE	p-value	95% CI	R^2
20	Individual [a]	-0.402	.239	.083	-0.85, 0.05	3.67%

[a] *reference category = group*

Table I.5

Mental health condition targeted meta-regressions

K	Model	Variable	Coefficient	SE	p-value	95% CI	R^2
20	1	Target condition [a]					
		Depression	-0.034	.208	.893	-0.53, 0.46	21.37%
		PTSD	-0.98	.401	.013*	-1.78, -0.21	
		Psychosis	0.658	.403	.102	-1.13, 1.45	
		Mental health NOS	0.172	.420	.681	-0.68, 0.99	
20	2	Target condition [a]					
		Depression	-0.03	.257	.906	-0.55, 0.47	10.88%
		PTSD	-0.99	.411	.016*	-1.79, -0.18	
		Psychosis	0.66	.412	.103	-0.13, 1.48	
		Mental health NOS	.20	.458	.661	-0.70, 1.10	
		Waitlist/no intervention [b]	.044	.220	.897	-0.40, 0.46	

[a] reference category = anxiety; [b] reference category = active control; PTSD = post-traumatic stress disorder

Table I.6

Single predictor meta-regression - cultural adaptation

K	Variable	Coefficient	SE	p-value	95% CI	R^2
20	Group [a]	-0.401	.231	.083	-0.85, 0.05	0.00%

[a] reference category = individual

Table I.7

Single predictor meta-regression- therapist related adaptations

K	Variable	Coefficient	SE	p-value	95% CI	R^2
20	Therapist-related [a]	-0.309	.231	.180	-0.76, 0.14	0.00%

[a] *reference category = no therapist-related adaptations*

Table I.8

Single predictor meta-regression- organisation-specific adaptation

K	Variable	Coefficient	SE	p-value	95% CI	R^2
20	Organisation-specific adaptation [a]	0.003	.243	.988	-0.47,0.48	0.00%

[a] *reference category = no organisation-specific adaptation*

Table I.9

Overarching adaptation areas meta-regressions

K	Model	Variable	Coefficient	SE	p-value	95% CI	R^2
20	1	Overarching adaptation area					
		Therapist-related adaptation [a]	0.312	.238	.191	-0.16, 0.78	0.00%
		Organisation-specific adaptation [b]	-0.021	.248	.933	-0.51,0.46	
20	2	Overarching adaptation area					
		Therapist-related adaptation [a]	0.322	.254	. 206	-0.18, 0.82	0.00%
		Organisation-specific adaptation [b]	-0.023	.260	.931	-0.53, 0.48	
		Waitlist/no intervention [c]	0.042	.248	.866	-0.44, 0.53	

[a] *reference category = no delivery adaption;* [b] *reference category = no organisation-specific adaptation;* [c] *reference category = active control*

Common factors adaptations

Table I.10.

Single predictor meta-regression – adaptation to therapeutic relationship

K	Variable	Coefficient	SE	p-value	95% CI	R^2
20	Therapeutic relationship[a]	-0.141	.241	.559	-0.61, 0.33	0.00%

[a] *reference category= no therapeutic relationship adaptation*

Table I.11

Single predictor meta-regression - acceptability and suitability

K	Variable	Coefficient	SE	p-value	95% CI	R^2
20	Acceptability and suitability [a]	-0.091	.522	.861	-1.11, 0.93	0.00%

[a] *reference category= no acceptability and suitability adaptation*

Table I.12

Common factors adaptations meta-regressions

K	Model	Variable	Coefficient	SE	p-value	95% CI	R^2
20	1	Common factors					
		Therapeutic relationship	0.138	.542	.579	-0.35, 0.63	0.00%
		Acceptability and suitability	0.044	.249	.935	-1.01, 1.10	
20	2	Common factors					
		Therapeutic relationship	0.143	.265	.588	-0.37, 0.66	0.00%
		Acceptability and suitability	0.027	.587	.962	-1.12, 1.17	
		Inactive control [a]	-0.030	.252	.906	-0.53,0.47	

[a] *reference category = active control*

Specific adaptation type

Table I.13

Single predictor meta-regression – explicit cultural (content-related) adaptation

K	Variable	Coefficient	SE	p-value	95% CI	R^2
20	Explicit cultural adaptation [a]	-0.181	-0.478	.633	-0.93, 0.56	0.00%

[a] *reference category = no explicit cultural adaptation*

Table I.14

Single predictor meta-regression- form used to deliver treatment

K	Variable	Coefficient	SE	p-value	95% CI	R^2
20	Form used [a]	0.348	.269	.196	-0.18, 0.87	0.00%

[a] *reference category = no adaptations to the form used to delivery treatment*

Table I.15

Single predictor meta-regression - language translation adaptation

K	Variable	Coefficient	SE	p-value	95% CI	R^2
20	Language translation [a]	.0507	.235	.829	-0.41,0.51	0.00%

[a] *reference category = no language translation*

Table I.16

Specific adaptation type meta-regressions

K	Model	Variable	Coefficient	SE	p-value	95% CI	R^2
20	1	Specific adaptation type					
		Cultural	0.059	.473	.900	-0.87, 0.99	0.00%
		Language translation	0.141	.295	.633	-0.44, 0.72	
		Medium used	0.408	.348	.241	-0.27, 1.09	
20	2	Specific adaptation type					
		Cultural	0.034	0.504	.945	-0.95, 1.02	0.00%
		Language translation	0.164	0.322	.609	-0.47, 1.02	
		Medium used	0.417	0.364	. 251	-0.30,1.13	
		Inactive control [a]	0.069	0.300	.816	-0.52,0.66	

[a] *reference category = active control*

Appendix J

Variables Used in Current Study

Table J.1

Variables used in current study

Categorical Variable	Description	Categories used in analysis
Ethnicity	Self-reported ethnicity. "White" or "Black, Asian and minority ethnic (BAME) groups".	"1 = White" or "0 =Black, Asian and minority ethnic (BAME) groups"
Gender	Gender of participant	“1= women” or “0= men”
Employment	Whether participant was employed	"1= Yes" or "0= no"
Prescribed medication	Whether participant was prescribed psychotropic medications	"1= Yes" or "0= no"
Long-term health condition	Whether participant has previously been diagnosed with a chronic physical health condition	"1= Yes" or "0= no"
Cognitive behavioural therapy (CBT)	Whether participants received CBT	"1= Yes" or "0= other therapy types"
Counselling	Whether participants received counselling for depression	1= Yes" or "0= other therapy types"
Age	Self-reported age at referral.	Continuous predictor
Index of multiple deprivation (IMD)	Local area of deprivation. Decile ranged from 1= most to 10 least deprived areas in England.	Continuous predictor
WSAS	Measures impact of mental health condition on 5 domains: work, home management, social life, leisure activities, family, and relationships.	Continuous predictor
Baseline PHQ-9	Total scores obtained at intake assessment	Continuous predictor
Baseline GAD-7	Total scores obtained at intake assessment	Continuous predictor

Appendix K

Table K.1
Self-reported Ethnicity of Study Sample

Ethnicity	*N* = 17,109	(% of total sample)
White		
British	73,33	43
Irish	404	2
Any Other White background	3,058	18
Mixed-heritage		
White and Black Caribbean	346	2
White and Black African	139	1
White and Asian	165	1
Any Other Mixed background	503	3
Asian or Asian British		
Indian	835	5
Pakistani	438	3
Bangladeshi	380	2
Any Other Asian background	646	4
Black or Black British		
Caribbean	941	6
African	762	5
Any Other Black background	352	2
Chinese	97	1
Other Ethnic Groups	710	4

Appendix L

Descriptive of Sample

Table L.1

Descriptive and Baseline Test Statistics

	White (*n*= 10,795)	BAME (*n*= 6,314)	Chi square
	Count (%)	Count (%)	
Female	7535 (68)	4538 (72)	χ^2 (1, *N* = 17075) = 27.02, *p* < .001
Male	3422 (32)	1762 (28)	
Employed	6687 (63)	3161(50)	χ^2 (1, *N* = 17109) = 230.24, *p* < .001
Unemployed	4108 (38)	3153 (50)	
Prescribed medications	5159 (48)	2577(41)	χ^2 (1, *N* = 17109) = 78.28, *p* <.001
Not prescribed medications	5636 (52)	3737 (59)	
Had LTCs	3029 (28)	1745(28)	χ^2 (1, *N* = 17109) = 0.353, *p* >.005
No LTCs	7766 (72)	4569 (72)	
CBT	8447 (78)	5021 (80)	χ^2 (1, *N* = 17109) = 3.85, *p* > .05
Not CBT	2348 (22)	1293 (20)	
Counselling	1866 (17)	997 (16)	χ^2 (1, *N* = 17109) = 6.39, *p* = .01
Not Counselling	8989 (83)	5317 (84)	

Table L.2

	White (*n*= 10,795)	BAME (*n*= 6,314)	*t*-test
	Mean (SD)	Mean (SD)	
IMD	4.18 (2.30)	3.93 (2.11)	*t* (12942) = -5.95 *p*<.001; mean difference: -0.19 (0.3), 95% CI: -0.26 to -0.13
Age	40.34 (10.04)	37.14 (12.60)	*t* (14385) = 109.42, *p* < .001; mean difference: 3.21 (0.21), 95% CI: -3.62 to -2.79
Baseline WSAS	21.50 (8.59)	21.92 (8.77)	*t* (16618) = 1.83, CI = -0.02 to 0.53 *p* = .067
Baseline PHQ-9	17.70 (4.53)	18.21 (4.48)	*t* (13283) = 7.14, *p*< .001; mean difference = 0.51 (0.71), 95% CI: 0.37 to 0.65
Baseline GAD-7	14.36 (4.53)	14.96 (4.45)	*t* (13441) = 8.53, *p*< .001; mean difference = 0.62 (0.71); 95% CI: 0.47 to 0.75
Session number: mean	10 (4.55)	9.60 (4.33)	*t* (13754) = 3.55, *p*< .001; mean difference = - 0.47 (0.70), 95% CI: - 0.60 to 0.33

ppendix M

Table M.1

Growth Parameter Statistics: full sample Latent Growth Curve Models.

	PHQ-9		GAD-7	
	Mean	95% CIs	Mean	95% CIs
Intercept	17.56	17.50 to 17.62	14.48	14.40 to14.52
Slope	-0.125	-1.27 to -1.23	-0.86	-0.88 to -0.84
Quadratic	0.05	0.048 to 0.052	0.03	0.026 to 0.030

Table M.2

Model Fit Indices for Latent Growth Model with Ethnicity

		Estimate	95% CI	*p*
Quadratic latent growth curve ethnicity				
PHQ-9	Intercept	-0.67	-0.78 to -0.54	<.0001
	Slope	-0.02	-0.06 to -0.03	.546
	Quadratic	0.004	0.001 to 0.008	.085
GAD-7	Intercept	-0.72	-0.84 to -0.60	<.0001
	Slope	-0.02	-0.06 to 0.02	.438
	Quadratic	0.005	0.001 to 0.008	.035

Appendix N

Descriptive Information of Depression Trajectories

Table N.1

Descriptive for Trajectories of Depressive Symptoms (Categorical Variables

	Class 1 *n* = 4535	Class 2 *n* = 3320	Class 3 *n* = 9241
Employed	1772(40)	1859(56)	6216 (67)
Not employed	2673(60)	1415(43)	2893 (31)
Prescribed Medications	1965 (43)	1572 (48)	5484 (59)
Not prescribed medications	2570 (57)	1675 (52)	3484 (38)
Long-term health conditions	1539 (34)	961 (29)	2273 (25)
No long-term health conditions	2296 (66)	2359 (71)	6968 (75)
Men	1427 (32)	1035 (31)	2714 (29)
Women	3104 (68)	2284 (69)	6498 (70)
White	2743 (61)	1952 (59)	6094 (660
Mixed	268 (6)	206 (6)	678 (7)
Black	548 (12)	463 (14)	1041 (11)
Other	239 (5)	165 (5)	305 (3)
Chinese	22 (1)	14 (1)	61 (1)
Asian	715 (16)	520 (16)	1052 (12)
Did not received CBT	920 (20)	574 (17)	2140 (23)
Received CBT	3615 (80)	2746 (83)	7101 (77)
Did not received counselling	3824 (84)	2873 (87)	7327 (82)
Received counselling	711(16)	447 (14)	1704 (18)

Table N.2

Descriptive for Trajectories of Depressive Symptoms (Continuous Variables)

Continuous predictors		Mean (SD)	
Age	40.51 (12.90)	39.35 (13.39)	38.42 (13.96)
IMD	3.85 (1.99)	3.93 (2.01)	4.28 (2.08)
Session number	10.47(5.07)	9.21 (3.83)	9.86 (4.32)
Baseline PHQ-9	21.36(3.22)	21.53 (2.81)	12.63 (4.32)
Baseline GAD-7	17 (3.61)	16.72 (3.64)	14.87 (3.18)
Baseline WSAS	21.98 (8.61)	21.92 (8.79)	21.67 (8.74)

Appendix O:

Sample Descriptive for Anxiety Trajectories

Table O.1

Descriptive for Trajectories of Anxiety Symptoms (Categorical Variables)

	Class 1 *n*=1940	Class 2 *n*=5481	Cass 3 *n*=6022	Class 4 *n*=3290
Categorical variables		Count (%)		
Employed	903 (47)	3989 (68)	1485 (25)	2147 (65)
Not employed	1037 (54)	1852 (32)	2607 (43)	1143 (35)
Prescribed Medications	903 (46)	2241 (38)	3180 (53)	1886 (57)
Not prescribed medications	1037 (54)	3600 (62)	2842 (47)	50 (2)
Long-term health conditions	2241 (38)	3180 (53)	1886 (57)	847 (26)
No long-term health conditions	1361 (70)	4400 (75)	4117 (68)	2443 (74)
Male	595 (31)	1816 (31)	1778 (30)	976 (30)
Female	1341 (70)	4006 (69)	4229 (70)	2308 (70)
White	1113 (57)	3961 (68)	3638 (60)	2076 (63)
Mixed	130 (7)	424 (7)	368 (6)	230 (7)
Black	264 (14)	628 (11)	746 (12)	412 (13)
Other	97 (5)	169 (3)	321 (5)	122 (4)
Chinese	12 (0.6)	42 (0.7)	28 (1)	15 (1)
Asian	324 (17)	617 (11)	921 (15)	435 (13)
Received CBT	1612 (83)	4371 (75)	4806 (80)	2671 (81)
Did not received CBT	328 (17)	1479 (25)	1216 (20)	619 (19)
Received counselling	265 (14)	1173 (20)	946 (15.7)	478 (15)
Did not receive counselling	1675 (86)	4668 (80)	5076 (84.3)	2812 (86)

Table O.2

Descriptive for Trajectories of Anxiety Symptoms (Continuous Variables)

Continuous variables	Mean (SD)			
Age	39.12 (13.04	38.59 (14.27)	39.94 (13.03)	38.74 (13.72)
IMD	4.05 (2.16)	4.27 (2.24)	3.91 (2.17)	4.16 (2.24)
GAD	19.17 (4.2)	10.2 (3.56)	16.4 (3.24)	16.85 (2.73)
PHQ	16.59 (3.23)	15.01 (3.63)	19.94 (4.14)	18.46 (4.18)
WSAS	21.89 (8.9)	21.45 (8.78)	21.86 (8.56)	22.06 (8.76)

Appendix P
Missing Data

Table P.1

Percentage of Missing Data for Each Variable

Variables	Count (%) missing
Gender	34 (0.2)
PHQ base	65 (0.4%)
GAD base	73 (0.4%)
IMD	2357 (14)

Appendix Q

Association between Variables and Class Memberships

Table Q.1

Associations between Sociodemographic and Treatment Variables with PHQ9 Trajectories (N= 12691)

	Class 1 (Non-responders)			Class 2 (High-severity Responders)		
	OR	95% CIs	*p*	OR	95% CIs	*p*
White (vs BAME)	**0.871**	**0.752,1.008**	**.009**	**0.691**	**0.593,0.807**	**<.001**
Gender: Women (vs men)	**0.811**	**0.696,0.944**	**.012**	**0.800**	**0.671,0.930**	**.007**
Employed (vs unemployed)	**0.247**	**0.214,0.289**	**<.001**	**0.677**	**0.578,0.793**	**<.001**
Prescribed medication (vs not)	**2.722**	**2.358,3.141**	**<.001**	**2.046**	**1.756,2.383**	**<.001**
LTCs (vs not)	**1.661**	**1.420,1.942**	**<.001**	1.213	1.021,1.442	.094
CBT (vs other HI intervention)	0.760	0.542,1.066	.125	1.045	0.702,1.555	.858
Counsel (vs other HI intervention)	0.718	0.501,1.028	.072	0.733	0.479,1.120	.157
Age	**1.008**	**1.002,1.013**	**.019**	1.006	1.001,1.012	.104
Baseline GAD-7	**1.584**	**1.5391.630**	**<.001**	**1.550**	**1.5091.592**	**<.001**
Baseline WSAS	1.003	0.9951.011	.588	1.002	0.9941.011	.665
IMD	**0.905**	**0.8760.934**	**<.001**	**0.894**	**0.8640.925**	**<.001**

Note. Reference class = Class 3 (Moderate-severity Responders); OR= odds ratios; CI= Confidence intervals. Bold text indicates significant variables.

Table Q.2

Associations between Sociodemographic and Treatment Variables with GAD-7 Trajectories (N=12691)

	Class 1 (Non-responders)			Class 2 (Slow Initial Responders)			Class 3 (Early Responders)		
	OR	95% CIs	*p*	OR	95% CIs	*p*	*OR*	95% CIs	*p*
White (vs BAME)	**0.834**	**0.722-0.963**	**.02**	**0.549**	**0.46-0.66**	**<.001**	**0.835**	**0.709-0.985**	**.048**
Women (vs men)	1.160	1.000-1.345	.126	1.087	0.90-1.31	.478	1.081	0.913-1.280	.468
Employed (vs unemployed)	**0.334**	**0.289-0.386**	**<.001**	**0.731**	**0.61-0.88**	**.001**	1.080	0.908-1.285	.482
Prescribed medications (vs not)	**1.244**	**1.078-1.430**	**.023**	0.974	0.82-1.16	.804	0.856	0.727-1.007	.088
LTCs (vs not)	**1.234**	**1.057-1.442**	**.044**	**1.198**	0.991.45	.155	0.933	0.773-1.125	.528
CBT (vs other HI)	1.151	0.834-1.588	.503	1.740	1.10-2.73	.119	1.353	0.928-1.972	.255
Counselling (vs other HI)	0.966	0.687-1.359	.865	0.921	0.57-1.50	.772	0.766	0.511-1.150	.216
Age	**1.007**	**1.002-1.012**	**.030**	1.006	1.00-1.01	.095	1.002	0.996-1.008	.635
Baseline PHQ9	**1.531**	**1.499-1.563**	**<.001**	**1.451**	**1.41-1.49**	**<.001**	**1.400**	**1.371-1.430**	**<.001**
Baseline WSAS	1.006	0.998-1.014	.206	1.003	0.99-1.01	.593	1.011	1.002-1.020	.051
IMD	0.979	0.949-1.010	.255	1.003	0.97-1.04	.908	1.017	0.982-1.053	.425

Note. Reference class = Class 4 (Moderate-severity Responders); OR= Odds ratio; 95%CIs = 95% confidence intervals. Bold text indicates significant variables.

Appendix R

Sensitivity analysis

Table R.1

Association between Variables and PHQ-9 Trajectories (N= 16516)

	Class 1 (Non-Responders)			Class 2 (High-severity Responders)		
	OR	95% CIs	*p*	*OR*	95% CIs	*p*
White (vs BAME)	**0.822**	**0.730-0.940**	**.007**	**0.669**	**0.584-0.767**	**<.001**
Women (vs men)	**0.788**	**0.692-0.897**	**.001**	**0.811**	**0.703-0.37**	**.008**
Employment (vs unemployed)	**0.240**	**0.211-0.272**	**<.001**	**0.683**	**0.594-0.785**	**<.001**
Prescribed medication (vs not)	**2.377**	**2.102-2.689**	**<.001**	**1.951**	**1.704-2.234**	**<.001**
Long-term condition (vs not)	**1.513**	**1.317-1.738**	**<.001**	**1.237**	**1.058-1.446**	**.044**
CBT (vs other HI)	0.758	0.550-1.046	.104	1.041	0.735-1.475	.852
Counsel (vs other HI)	**0.707**	**0.500-1.001**	**.050**	0.750	0.512-1.099	.152
Age	**1.010**	**1.006-1.015**	**<.001**	**1.006**	**1.001-1.012**	**.047**
Baseline GAD-7	**1.586**	**1.547-1.625**	**<.001**	**1.553**	**1.517-1.591**	**<.001**
Baseline WSAS	1.005	0.998-1.012	.229	1.003	0.995-1.01	.537
IMD	**0.889**	**0.863-0.916**	**<.001**	**0.886**	**0.857-0.916**	**<.001**

Note. Class 3: Moderate-severity Responder) serves as the reference class. Bold text indicates significant variables.

Table R.2

Associations Between All Ethnic Groups, Other Variables and PHQ-9 Trajectories (N= 16516)

	Class 1 (Non-Responders)			Class 2 (High-severity Responders)		
	OR	95% CIs	*p*	*OR*	95% CIs	*p*
Mixed	0.916	0.733-1.145	.497	1.092	0.861-1.384	.560
Black	1.044	0.866-1.257	.711	1.032	0.836-1.275	.806
Other	1.471	1.114-1.942	.058	1.577	1.150-2.146	.055
Chinese	1.327	0.556-3.169	.641	0.998	0.354-2.820	.998
Asian	**1.400**	**1.166-1.682**	**.010**	**1.508**	**1.241-1.833**	**.004**
Women (vs men)	**0.797**	**0.700-0.908**	**.001**	**0.826**	**0.714-0.959**	**.015**
Employment (vs unemployed)	**0.241**	**0.213-0.273**	**<.001**	**0.677**	**0.589-0.779**	**<.001**
Prescribed medication (vs not)	**2.356**	**2.085-2.661**	**<.001**	**1.902**	**1.662-2.177**	**<.001**
Long-term condition (vs not)	**1.511**	**1.315-1.736**	**<.001**	**1.240**	**1.060-1.449**	**.042**
CBT (vs other HI)	**0.759**	**0.552-1.045**	**.103**	**1.037**	**0.734-1.466**	**.864**
Counsel (vs other HI)	0.713	0.506-1.007	.055	0.752	0.515-1.100	.154
Age	**1.011**	**1.006-1.015**	**<.001**	1.006	1.00-1.011	.078
Baseline GAD-7	**1.583**	**1.545-1.623**	**<.001**	**1.553**	**1.516-1.590**	**<.001**
Baseline WSAS	1.005	0.998-1.012	.226	1.003	0.996-1.011	.489
IMD	**0.884**	**0.858-0.911**	**<.001**	**0.879**	**0.850-0.909**	**<.001**

Note. Class 3 (Moderate-severity Responder) serves as the reference class. White = reference group. Bold text indicates significant variables.

Table R.3

Associations between Variables and PHQ-9 Trajectories, Stratified by Ethnic Minority Groups (N= 5850)

	Class 1 (Non-Responders)			Class 2 (High-severity Responders)		
	OR	95% CIs	*p*	*OR*	95% CIs	*p*
Mixed	1.001	0.691-1.451	.996	0.723	0.485-1.078	.114
Other	1.457	1.044-2.034	.122	1.511	0.796-1.664	.558
Chinese	1.108	0.47-2.747	.860	0.486	0.161-1.467	.115
Asian	1.340	1.058-1.697	.078	1.140	0.896-1.451	.402
Women (vs men)	0.812	0.644-1.024	.101	0.777	0.609-0.992	.053
Employment (vs unemployed)	**0.309**	**0.247-0.385**	**<.001**	**0.723**	**0.588-0.907**	**.005**
Prescribed medication (vs not)	**3.09**	**2.477-3.845**	**<.001**	**2.392**	**1.900-3.010**	**<.001**
Long-term condition (vs not)	1.298	1.015-1.648	.124	1.217	0.946-1.556	.243
CBT (vs other HI)	0.631	0.373-1.068	.068	0.930	0.555-1.559	.811
Counsel (vs other HI)	0.600	0.339-1.062	.055	0.789	0.446-1.397	.442
Age	**1.013**	**1.004-1.022**	**.022**	**1.007**	**0.998-1.016**	**.211**
Baseline GAD-7	**1.612**	**1.539-1.689**	**<.001**	**1.525**	**1.469-1.584**	**<.001**
Baseline WSAS	0.999	0.988-1.011	.935	0.997	0.985-1.009	.665
IMD	**0.939**	**0.891-0.990**	**.045**	0.960	0.908-1.014	.205

Note. Class 3 (Moderate-severity Responder) serves as the reference class. Black = reference group. Bold text indicates significant variables.

Table R.4

Associations Between Variables and GAD-7 Trajectories (N=15803)

	Class 1 (Non-Responders)			Class 2 (High-severity Slow Responders)			Class 3 (High-severity Responders)		
	OR	95% CIs	*p*	*OR*	p-value	*95% CIs*	*OR*	95% CIs	*p*
White (vs BAME)	**0.763**	**0.670-0.868**	**<.001**	**0.557**	**<.001**	**0.474-0.654**	**0.814**	**0.701-0.945**	**.012**
Women (vs men)	1.245	1.092-1.420	.054	1.088	.423	**0.92221.284-**	1.178	1.011-1.372	.103
Employed (vs not)	**0.340**	**0.298-0.387**	**<.001**	**0.759**	**.001**	**0.644-0.895**	1.116	0.953-1.306	.278
Prescribed medications (vs not)	**1.249**	**1.101-1.416**	**.009**	0.992	.931	0.845-1.163	**0.848**	**0.732-0.982**	**.045**
Long-term health condition vs not)	1.157	1.003-1.334	.118	1.204	.112	1.010-1.435	0.918	0.773-1.091	.396
CBT (vs other HI)	1.060	0.793-1.417	.748	1.828	.083	1.189-2.812	1.275	0.914-1.778	.286
Counselling vs other HI)	0.802	0.587-1.097	.196	0.961	.887	0.600-1.539	0.719	0.498-1.039	.081
Age	**1.008**	**1.003-1.013**	**.005**	1.004	.211	0.999-1.010	1.004	0.998-1.010	.280
Baseline PHQ-9	**1.536**	**1.507-1.565**	**<.001**	**1.444**	**<.001**	**1.411-1.478**	**1.404**	**1.377-1.431**	**<.001**
WSAS	1.005	0.998-1.012	.220	1.003	.644	0.993-1.012	1.010	1.002-1.018	.057
IMD	0.977	0.948-1.007	.202	0.994	.793	0.957-1.032	1.016	0.981-1.052	.459

Note. Reference class = Class 4 (Moderate-severity Responders); Bold text indicates significant variables.

Table R.5

Associations Between All Ethnic Groups, Other Variables and GAD-7 Trajectories (N= 16516)

	Class 1 (Non-Responders)			Class 2 (High-severity Slow Responders)			Class 3 (High-severity Responders)		
	OR	95% CIs	*p*	*OR*	95% CIs	*p*	*OR*	95% CIs	*p*
Mixed	0.892	0.705-1.129	.399	1.066	0.794-1.431	.731	0.998	0.754-1.320	.989
Black	1.233	1.015-1.497	.110	1.152	0.905-1.467	.369	1.270	1.022-1.578	.108
Other	**1.956**	**1.444-2.649**	**.008**	**2.355**	**1.628-3.408**	**.010**	1.269	0.843-1.909	.393
Chinese	0.650	0.229-1.843	.396	1.070	0.413-2.771	.909	0.463	0.135-1.591	.122
Asian	**1.499**	**1.248-1.801**	**.003**	**2.051**	**1.667-2.523**	**<.001**	1.194	0.962-1.483	.216
Women (vs men)	**1.259**	**1.104-1.435**	**.010**	1.118	0.947-1.320	.296	1.187	1.019-1.383	.090
Employed (vs not)	**0.337**	**0.296-0.383**	**<.001**	**0.746**	**0.633-0.880**	**.001**	1.089	0.930-1.276	.393
Prescribed medications (vs not)	1.234	1.088-1.399	.013	0.959	0.818-1.124	.657	**0.836**	**0.721-0.969**	**.028**
Long-term health condition (vs not)	1.160	1.006-1.338	.112	1.212	1.017-1.445	.101	0.917	0.771-1.090	.388
CBT (vs other HI)	1.068	0.800-1.426	.718	1.862	1.200-2.891	.083	1.277	0.916-1.780	.283
Counselling vs other HI)	0.815	0.596-1.113	.230	0.959	0.605-1.579	.936	0.733	0.508-1.058	.103
Age	**1.008**	**1.003-1.012**	**.010**	1.003	0.997-1.009	.381	1.003	0.997-1.009	.361
Baseline PHQ-9	**1.536**	**1.507-1.565**	**<.001**	**1.445**	**1.412-1.479**	**<.001**	**1.403**	**1.376-1.430**	**<.001**
WSAS	1.005	0.998-1.013	.201	1.003	0.994-1.012	.571	**1.010**	**1.002-1.019**	**.044**
IMD	0.973	0.943-1.003	.126	0.982	0.944-1.020	.428	1.015	0.981-1.051	.469

Note. Reference class = Class 4 (Moderate-severity Responders); Reference group = White; Bold text indicates significant variables.

Table R.6

Associations Between Variables and GAD-7 Trajectories, Stratified by Ethnic Minority Groups (N= 5850)

	Class 1 (Minimal-Improvement)			Class 2 (Slow Initial Response)			Class 3 (Early Response)		
	OR	95% CIs	*p*	OR	95% CIs	*p*	*OR*	95% CIs	*p*
Reference group: Black									
Mixed	0.870	0.790-1.675	.512	0.801	0.539-1.574	.414	0.838	0.624-1.490	.502
Other	**1.895**	**0.373-0.746**	**.025**	2.032	0.719-1.598	.045	1.123	0.421-0.843	.684
Chinese	0.691	0.491-4.272	.496	0.891	0.351-4.736	.845	0.456	0.231-1.893	.135
Asian	**1.276**	**0.624-0.984**	**.018**	**1.546**	**0.910-1.613**	**.033**	1.020	0.647-0.988	.902
Women (vs men)	1.200	0.661-1.051	.237	1.146	0.718-1.270	.452	1.035	0.694-1.072	.841
Employed (vs not)	**0.379**	**2.125-3.283**	**<.001**	0.887	1.792-3.059	.413	0.966	2.084-3.125	.823
Prescribed medications (vs not)	1.321	0.610-0.940	.065	1.125	0.656-1.106	.483	0.795	0.491-0.739	.112
Long-term health condition vs not)	1.099	0.710-1.166	.550	1.411	0.965-1.706	.087	0.874	0.627-1.008	.438
CBT (vs other HI)	0.930	0.660-1.753	.800	1.318	0.703-2.861	.522	0.946	0.648-1.598	.871
Counselling vs other HI)	0.689	0.853-2.471	.162	0.925	0.629-2.871	.845	0.587	0.512-1.419	.071
Age	**1.016**	**0.975-0.993**	**.004**	**1.013**	**0.987-1.007**	**.041**	1.011	0.987-1.003	.105
WSAS	1.010	0.978-1.002	.173	1.012	0.987-1.016	.196	1.003	0.982-1.005	.708
Baseline PHQ-9	**1.536**	**0.630-0.673**	**<.001**	**1.441**	**0.901-0.977**	**<.001**	**1.391**	**0.88-0.930**	**<.001**
IMD	1.005	0.945-1.048	.873	0.964	0.898-1.024	.322	1.004	0.951-1.049	.923

Note. Reference class = Class 4 (Moderate-severity Responders); Bold text indicates significant variables**.**