Inequalities in mental health services
An intersectional approach to examining ethnicity, gender and socio-economic status in relation to psychological therapy treatment outcomes

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King's College London

Volume I

SYSTEMATIC LITERATURE REVIEW
EMPIRICAL RESEARCH PROJECT

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Thesis submitted in partial fulfilment of the degree of
Doctorate in Clinical Psychology

Institute of Psychiatry, Psychology and Neuroscience,
King's College London

May 2019

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Acknowledgements

I would like to thank both of my research supervisors, Dr Stephani Hatch and Dr Katharine Rimes for supervising my research project. Stephani, I have really appreciated your guidance, support and mentorship. Thank you for always encouraging me and for keeping me grounded throughout this difficult journey. Kate, thank you for always taking the time to provide very helpful feedback and for your continued support throughout. Special thanks to Shirlee MacCrimmon for always being so helpful in answering all my database related queries. This has been much appreciated.

Thank you to my fellow trainees who have become friends and a great support system to me. Aparna, Mazda, Leo, Kenny, Natasha, Elif and Alice – you have all been amazing. Thank you for pushing me towards the finish line. I really appreciate you.

To all my family and friends who have cheered me on throughout this process. Special thanks to Mum and Grandma for always believing in me. Your unconditional love and support have meant so much to me and I could not have come this far without you. To Adrian, thank you for always being there and for continually keeping me focused on my dreams.

To Mummy Hall, thank you for being the special woman that you are and for always checking in on me. To my brother, Jameel - I am encouraged by your determination and strong will to overcome many of the challenges you have faced. To my cousins Annie, Junior and Venisha - though distance may separate us, you have stuck with me throughout this journey (and through life!). Thank you all so very much. Most of all, I'm thankful to God for giving me the strength and courage to complete this journey.

A systematic review of ethnicity and cognitive behavioural therapy (CBT) treatment outcomes

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1. Abstract

Background: Disparities in mental health care among ethnic minority groups have been a long-standing concern. Whilst therapies such as cognitive behavioural therapy (CBT) have been found to be effective for common mental health problems such as anxiety disorders, post-traumatic stress disorder (PTSD) or depression, many of the early efficacy studies did not include a sufficient subsample of ethnic minority participants for these individuals to be investigated separately. It is important to understand whether disparities in CBT treatment outcomes by ethnicity exist. This review aimed to contribute to the existing literature by comparing CBT treatment outcomes between adults from ethnic minority backgrounds to their White counterparts and to report on the methodological quality of the included studies.

Method: PsycINFO, PsycARTICLES and OVID Medline databases were searched in June 2018 to identify relevant studies. Quantitative studies with a focus on anxiety disorders, PTSD or depression that compared CBT treatment outcomes between White European/American participants and participants with an ethnic minority status were included. Database searches yielded 5817 studies and 3 additional studies were identified through a reference search.

Results: A total of 16 studies involving 3, 413 participants were included; 14 studies from the United States and 2 from the United Kingdom. The review found that most studies (12 out of 16) reported no significant differences in CBT treatment outcomes for anxiety disorders, PTSD and/or depression between ethnic minority groups and their White counterparts. Two studies reported significantly poorer treatment outcomes whereas two studies reported greater improvement in symptoms among African American individuals compared to White participants.

Conclusion: The review highlighted important methodological limitations of the included studies, such as lack of power calculations, that should be taken into consideration when interpreting the findings.

2. Introduction

2.1. Inequalities in mental health care

Racial and ethnic minority groups in the United States (US) and United Kingdom (UK) are less likely to access mental health care, receive evidence-based treatments and are at greater risk of non-engagement from mental health services [1-5]. Studies have consistently documented that racial and ethnic minority groups are more likely to drop out of treatment and more likely to receive poorer quality of treatment than individuals from White majority backgrounds [5-7]. These inequalities have been attributed to factors such as beliefs about illness and treatment, stigma and poor engagement by clinicians [7]. A call to reduce these inequalities and mental health disparities has been addressed through the development of culturally adapted treatments [8-10], as well as interventions designed to improve therapeutic relationships and communications between racial and ethnic minority groups and mental health professionals [5]. However, the level of modification required to enhance the effectiveness of treatments for ethnic minority groups remains unknown [11, 12].

Disparities in the prevalence of both severe and common mental health problems among ethnic minority groups have been a long-standing concern [13-15]. Although severe mental health problems such as psychosis are associated with severe impairment, the higher prevalence of common mental health problems means that the costs to health care services are greater [16-18]. If untreated, common mental health problems can lead to long term physical, social and occupational impairment [19]. In the UK it is estimated that 1 in 6 adults (17%) experienced a common mental health problem, such as an anxiety disorder or depression, in the past week [16].

2.2. Treatment of common mental health problems

The National Institute for Health and Care Excellence (NICE) in the UK provides guidance about the pathway to care for common mental health problems with the aim of improving access to evidence based treatments [20, 21]. Over the past decade, government initiatives (e.g. the Five Year Forward View for Mental Health and the Improving Access to Psychological Therapies (IAPT) programme) have committed to providing evidence based psychological therapies for individuals with common mental health problems to reduce the associated impacts on social and occupational functioning [22, 23].

In recent years, the provision of psychological therapies, such as cognitive behavioural therapies (CBT), has increased in many UK services [24]. Cognitive behavioural therapies aim to reduce emotional distress by modifying unhelpful thoughts and behaviours [25]. Although CBT was originally developed as a treatment for depression, it has since been adapted and applied to a number of other common mental health problems [25]. For example, it has also been found to be an effective treatment for social phobia, obsessive compulsive disorder (OCD), generalised anxiety disorder (GAD), post-traumatic stress disorder (PTSD), panic disorder (with or without agoraphobia) and depression [26]. Different sub-types of cognitive behavioural therapies have been found to be effective, for example behaviour therapy for OCD [26].

2.3. CBT treatment outcomes by ethnicity

However, it should be noted that a majority of the early efficacy studies did not include a sufficient subsample of ethnic minority participants to facilitate comparison of

treatment outcomes by ethnicity [2, 12]. There are some comparison studies that have reported differences in treatment outcomes by ethnicity. Two studies have found African Americans to show less improvement in anxiety symptoms following in vivo exposure for agoraphobia compared to their White counterparts [27, 28]. In one of these studies, these differences were attributed to African Americans reporting significantly more traumatic events such as parental separation, physical or sexual abuse [27]. Traumatic and adverse life events as well as social and economic stressors are known risk factors for mental health problems among ethnic minority and migrant groups [16, 29, 30]. However, it should be noted that one of these studies reported preliminary findings from a study conducted in 1991 [27]. The authors later expanded their preliminary investigation by using a larger sample, and in their 1994 study reported no significant differences in improvement between the ethnic groups [31]. Poorer treatment outcomes have also been reported for African American HIV patients experiencing symptoms of depression compared to their White and Latino counterparts [32]. It is important to consider that this study presented exploratory analysis from a small sample with a co-occurring physical health problem.

Other studies comparing treatment outcomes by ethnicity for anxiety disorders have suggested that traditional treatment approaches such as CBT can have comparable therapeutic benefits for African Americans and White Americans [11]. Studies delivering CBT and exposure treatments for specific disorders such as PTSD, OCD and panic disorder have reported no differences in treatment outcomes between African American and White individuals [11, 33, 34]. A depression study comparing CBT treatment outcomes by ethnicity also found no significant differences in symptom

improvement between ethnic groups [35]. There are few treatment outcome studies comparing individuals from Hispanic/Latino backgrounds with individuals from White majority backgrounds [11]. Similarly, there are few studies comparing ethnic differences in treatment outcome between Asian Americans and their White counterparts. Nonetheless, the existing literature involving Asian Americans have indicated that this group can benefit from culturally adapted CBT treatment protocols [36, 37].

The aforementioned comparison studies suggest that well-delivered and appropriate treatments for ethnic minority groups may deliver comparable results to those observed among individuals from White majority groups [7]. However, there are some important limitations that should be considered when interpreting these findings. An important issue is that in most studies the comparison of treatment outcomes by ethnicity was not a primary aim and therefore analyses were described as preliminary or exploratory [27, 32, 33]. Additionally, the impact of concurrent medication treatment on CBT treatment outcomes is often overlooked [38, 39]. In some studies, treatment included cultural adaptations or did not follow a manualised approach [39, 40].

It is worth noting that changes to a standard CBT protocol may have enhanced the cultural appropriateness of the treatment delivered and consequently its overall effectiveness [11]. For example, the treatment protocol in one study was adapted to include prompts to discuss cultural issues [41]. Another study indicated that cultural sensitivity amongst trial clinicians with considerable experience of working with ethnic minority groups may have facilitated more discussions about cultural issues throughout treatment [39]. In a third study, the intervention was modified to include culturally

sensitive methods (bilingual clinicians, written materials available in Spanish, clinicians trained to show more respect and sympathy) known for their effectiveness among minority groups [35]. Although studies do not consistently state whether specific cultural adaptations are made to interventions, it is important to consider whether the treatment being delivered followed a standard approach or if they included specific cultural adaptations.

2.4. Reason for current review

There has been a call for further research involving individuals from ethnic minority groups and for researchers to increase efforts to analyse data by ethnicity [11]. The most recent systematic review on the effectiveness of CBT among ethnic minority groups was published in 2008 [12]. In this review, databases from 1950 to 2006 were searched and 12 studies were identified that included adults living in the United States, from ethnic minority backgrounds and with a range of psychological problems (e.g. anxiety disorder, depression, substance abuse). However, this 2008 review did not include studies comparing treatment outcomes by ethnicity (included ethnic minority participants only) and was limited to studies conducted in the US.

Whilst the evidence suggests that treatments based on a cognitive and/or behavioural approach may be beneficial for individuals from some ethnic minority groups, it is important to review the existing evidence systematically, comparing CBT treatment outcomes by ethnicity and discussing important methodological issues that may influence the interpretation of these findings. Consequently, this review aims to contribute to the existing literature by investigating whether there are disparities in CBT

outcomes for adults from ethnic minority groups compared to White participants and to report on the methodological quality of the associated studies. This review will also aim to ascertain whether studies comparing CBT treatment outcomes have been conducted in countries other than the US. To the best of the author's knowledge, a similar review has not yet been conducted.

This systematic review will aim to answer the following research question:

Do ethnic minority groups have poorer CBT treatment outcomes for anxiety disorders, PTSD or depression compared to their White counterparts?

3. Methodology

3.1. Search terms

Search terms were initially informed by keywords in previous CBT studies and the 2008 systematic review on the effectiveness of CBT that included ethnic minority participants only [12]. Initial searches were conducted to check that known papers would be captured by the search terms. Following this process, the search terms were revised and finalised through discussion with research supervisors.

PsycINFO, PsycARTICLES and OVID Medline databases were searched on 9 June 2018. The search was limited to papers published from 1950. However, no papers were removed from the initial search after applying this limit. The following search terms for ethnicity and CBT were used:

- (ethnic* OR rac* OR bme OR African* OR Latino OR Hispanic* OR Asian* OR Black)
- (CBT OR cognitive behav* OR cognitive therap* OR cognitive-behav* OR talking therap* OR behav* therapy OR behav* treatment OR behav* activation) and depression or anxiety disorders (common mental health problem* OR mood disorder* OR depress* OR anxiety* OR ptsd or post?traumatic stress* OR ocd OR panic* OR phobia* OR body dysmorph* OR agoraphob*)

Search terms to capture studies reporting ethnic differences (differ* OR disparit* OR similar*) and efficacy studies reporting CBT treatment outcomes (efficac* OR effect* OR

treatment outcome* OR outcome* OR recovery) were also included. The search terms were combined using the AND command.

3.2. Inclusion/ exclusion criteria for studies

Quantitative studies that reported analyses comparing CBT treatment outcomes by ethnicity were included if they had a focus on anxiety disorders, PTSD or depression. Studies were included if they reported comparison of outcomes between White European/American participants and participants with an ethnic minority status. Study participants were adults aged 18 years and older.

Studies were excluded if there was no comparison between White majority participants and ethnic minorities; if the analyses were reported in a previous paper; if participants were under 18 years or if they were case studies. CBT studies that focused on disorders other than anxiety disorders, PTSD or depression (e.g. bulimia nervosa, insomnia, substance misuse) were excluded. Comorbidity studies where the sample was recruited based on having an anxiety disorder, PTSD and/or depression, as well as another co-occurring mental or physical health problem (e.g. PTSD and substance misuse, depression in addiction, depression in Parkinson's/HIV) were excluded.

Quality ratings of the CBT studies included in this review were undertaken. As this was the first review to compare CBT outcomes between White majority participants and ethnic minorities, studies were not excluded based on a poor quality rating.

3.3. Operational definitions

3.3.1. Cognitive behavioural studies

Cognitive behavioural treatment studies were defined as those employing traditional cognitive and/or behavioural interventions. Studies may have included cognitive interventions (e.g. psycho-education, cognitive restructuring, thought challenging) and/or behavioural interventions (e.g. behavioural activation, exposure-based treatments, behavioural experiments). Third wave CBT approaches such as Mindfulness Based Cognitive Therapy (MBCT), Dialectical Behaviour Therapy (DBT) or Acceptance and Commitment Therapy (ACT) were not included in this review as these approaches tend to extend and, in some cases, deviate from traditional CBT approaches.

3.3.2. Treatment outcome

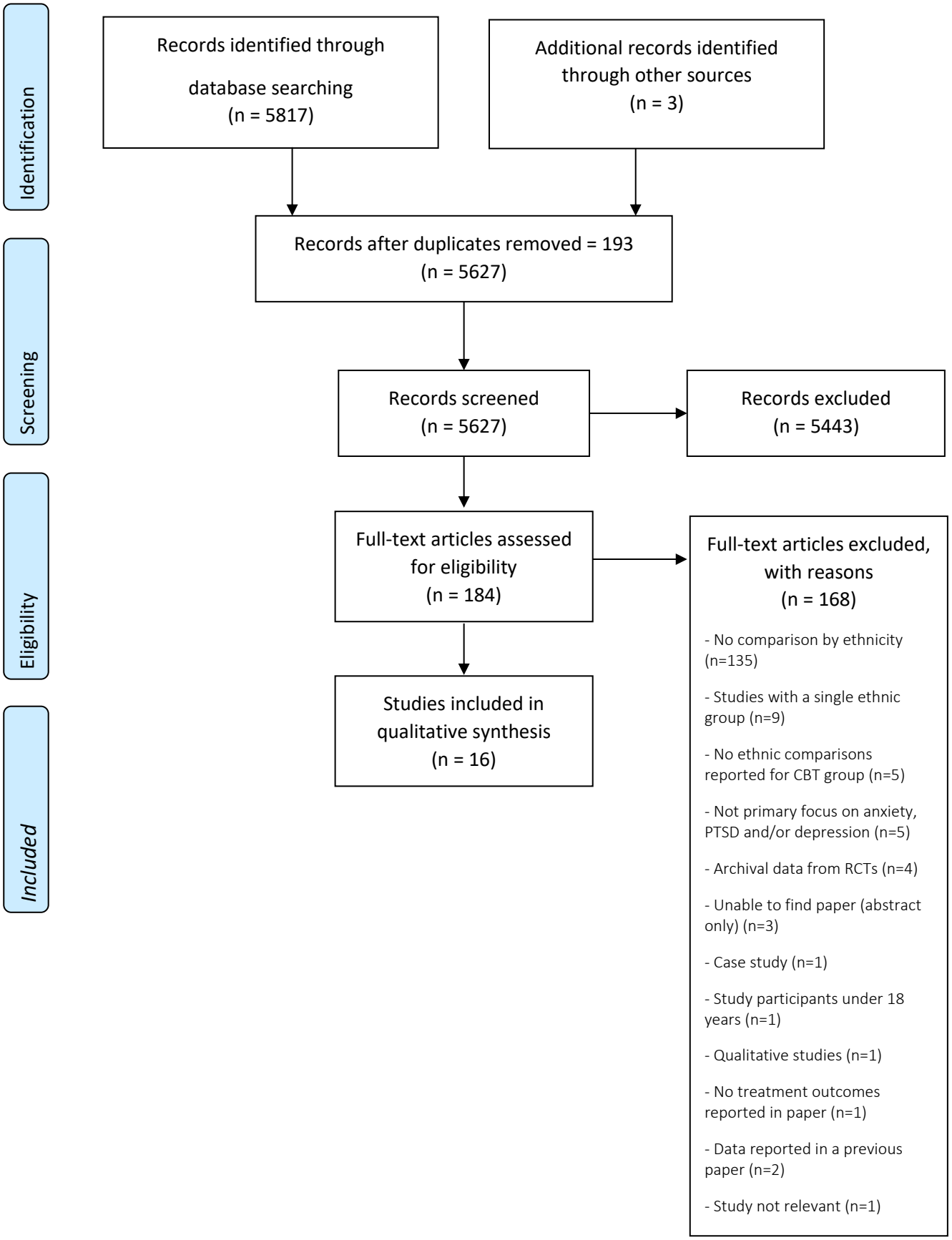
For each study, treatment outcome was ascertained by examining change or reduction in symptoms. Differences in baseline symptom scores and whether these were controlled for in the analyses were examined for studies that only compared differences in symptom scores post treatment.

3.4. Selection process

The database search yielded 5817 studies and three additional studies were identified through a reference search of relevant studies. Papers retrieved from all three database searches were compiled in a reference manager. An automated duplicate search was conducted and duplicates were manually removed after reviewing the references identified. There were two main stages through which papers were selected for this review. Titles and abstracts were screened to identify clearly irrelevant or ineligible

studies (e.g. participants under 18, studies involving a single ethnic group, studies that did not focus on an anxiety disorder, PTSD or depression). The full texts of the remaining studies were independently reviewed by the main author and a second reviewer screened 10% (n = 18) of the full texts. There was 100% agreement between both reviewers when screening full texts. After identifying eligible papers, the reference lists were reviewed in order to identify other potentially relevant studies. Figure 1 shows the PRISMA flow chart with details of this process.

Figure 1: PRISMA Flow Chart



3.5. Data extraction and analysis

A standardised database with pre-specified categories was created to facilitate the data extraction process. The location, sample characteristics and the clinical and socio-demographic characteristics (e.g. diagnoses, ethnicity, age, gender) were extracted for each eligible study. Information on the study design, main outcome measures, baseline comparisons by ethnicity and whether participants were receiving medication and/or other therapy were also captured. A description of the CBT intervention, nature of any comparison intervention (if applicable), mode of therapy (i.e. individual, group, online) and the number, duration and length of treatment sessions were extracted. The main results of each study, together with the results of ethnicity comparison on treatment outcomes were also extracted. Additionally, limitations which could influence the way in which the results of the study can be interpreted were noted.

3.6. Quality assessment of studies

The Effective Public Health Practice Project Quality Assessment Tool (EPHPP) was used to assess the quality of studies [42, 43]. The EPHPP is a generic tool that can be used to evaluate the quality of a range of intervention studies with designs such as observational, cross sectional, before and after studies and randomised controlled trials (RCTs) [43]. It has been found to be suitable for use in systematic reviews assessing effectiveness [44] and has demonstrated good content and construct validity [42]. The tool has also demonstrated fair inter-rater reliability when rating individual domains and excellent agreement of the global rating assigned to each paper [43].

The EPHPP tool assesses the following six domains: (A) selection bias, (B) study design, (C) confounders, (D) blinding, (E) data collection methods and (F) withdrawals/dropouts. Each of the six domains can be rated as either strong, moderate or weak. Studies with no weak ratings are given a global rating of 'Strong', studies with one weak rating are given a global rating of 'Moderate' and studies with two or more weak ratings are given a global rating of 'Weak'. Blinding of outcome assessors or participants is typically not expected in cohort studies, retrospective chart reviews or naturalistic studies. Therefore, for these studies this domain was rated as not applicable and was not included in the global rating.

There were initial discrepancies between the two reviewers for 8 of the 16 included studies (see Appendix 1). These discrepancies were mainly due to differences in the interpretation of criteria for the data collection methods domain; specifically, whether it would be acceptable if information on the reliability and validity of outcome measures was not explicitly stated but was reported in a separate study. Following review of the quality assessment tool dictionary, there was consensus that it would be acceptable if this information was reported in a separate study. The remaining discrepancy was due to an oversight so was resolved after this had been identified.

4. Results

4.1. Overview of study characteristics

A total of 16 studies from 1994 to 2017 involving a total of 3, 413 participants (67.8% White and 32.1% ethnic minority groups) met the inclusion criteria and are summarised in Table 1. A majority (n = 14) of these studies were conducted in the United States and 2 were conducted in the United Kingdom. Fifteen studies were conducted in outpatient settings, such as primary care mental health services, specialist clinics, community non-mental health settings (e.g. libraries, leisure centres or community centres) and an academic institution. One study was conducted in an inpatient acute care setting. Most studies (n = 11) recruited from a clinical population, 3 recruited veterans, 1 recruited from a community sample and 1 recruited female assault victims. Study sample sizes ranged from 25 to 590. Mean ages for the samples ranged from 29 to 51 years. Seven studies had more female participants, a further 6 studies had more male participants, 2 studies included females only and 1 study did not state gender proportions in the outcome data analysed.

4.2. Ethnicity

Studies conducted in the USA compared White European/American participants with ethnic minority groups described as African American, Latino American, Hispanic American, Asian American, American Indian and groups described as Other. UK studies compared White British participants with ethnic minority groups described Asian, Black, Mixed and Other. Thirteen studies comprised of a majority White sample (proportions of White participants range from 51% to 84.6%), 2 studies consisted of a higher

proportion of ethnic minority participants (60% and 67.3%) and 1 study had the same proportion of White and ethnic minority participants (50% in each group).

4.3. Diagnoses

The majority of the included studies had a primary focus on anxiety disorders or PTSD (n = 10). Anxiety studies included agoraphobia, panic disorder (PD), generalised anxiety disorder (GAD), social anxiety disorder (SAD) and obsessive-compulsive disorder (OCD). Six studies focused on both anxiety and depression symptoms.

4.4. Overview of Study Design & Cognitive Behavioural Therapies

Seven of the included studies were randomised controlled trials, 2 studies were controlled clinical trials, 2 were cohort studies and 1 cohort analytic study. There were also 2 naturalistic studies and 2 retrospective chart reviews. Cognitive and/or behavioural treatments included CBT only, CBT plus medication management, Exposure and Response Prevention (ERP), interoceptive and in vivo exposure. Treatments for post-traumatic stress disorder included a combination of Prolonged Exposure (PE) and Cognitive Processing Therapy (CPT); a treatment that includes elements of CBT. Interventions included a range of CBT techniques including psycho-education, thought challenging, cognitive restructuring, cognitive coping strategies, problem solving, exposure and behaviour experiments. Treatment sessions were delivered face to face, online, by telephone or in groups. Most studies (n = 11) reported the total number of treatment sessions, which ranged from 5 sessions to 20 sessions. Four studies reported the mean number of sessions only. One of these studies reported the average number of sessions per ethnic group (Black = 2.1, White = 3.8) and the other three studies

reported overall averages of 8.2, 16.2 and 20 sessions. One study reported that participants received between 12 to 13 hours of therapy over approximately 6 weeks and the other did not provide information on number of treatment sessions. Individual treatment sessions lasted from 30 to 90 minutes. Group sessions lasted from 45 minutes to two and a half hours.

4.5. Outcome Measures

A range of outcome measures were used. Measures of anxiety or PTSD included the Mobility Inventory (MI), Brief Symptom Inventory (BSI-12), Anxiety Disorder Interview Schedule – Revised (ADIS-R), PTSD Checklist Military Version (PCL-M), Hamilton Anxiety Rating Scale (HAM-A), Liebowitz Social Anxiety Scale (LSAS) and the Generalised Anxiety Disorder Scale (GAD-7). Depression measures included the Beck Depression Inventory (BDI), Patient Health Questionnaire Depression Scale (PHQ-9) and Hamilton Depression Rating Scale (HAM-D).

Table 1: Summary of characteristics and treatment outcomes of included studies

First Author, Year and Country	Study Setting/Sample Characteristics	Sample size	Ethnicity n (%)	Age (Mean years)	Gender	Diagnoses	Study Design [a] & Treatment Groups [b]	Treatment Characteristics [c] & CBT Techniques [d]	Main Outcome Measures	Summary of ethnicity comparisons
Anxiety and PTSD Studies										
Chambless 1995, USA [28]	Outpatient – Clinical population (outcome data)	58	White = 43 (74.1); AfAm = 15 (25.9)	Not stated	Not stated for outcome data	**Anxiety**: Agoraphobia with panic attacks, PD with agoraphobia; PD with limited avoidance	[a] Cohort [b] In vivo exposure with stable type and dose of medication prior to treatment	[c] At least 10 individual sessions (max = 20); 60 or 90 minutes; Once or twice weekly [d] Waiting for panic to pass; paradoxical intention; diaphragmatic breathing; thought stopping.	MI; MPR; BAT (Anxiety and Avoidance)	Significant differences between White and AfAm participants in the amount of change on measures of phobia and in frequency of panic attacks at post treatment or follow up (controlling for SES). AfAms showed less improvement on measures of avoidance and in frequency of panic attacks.
Chavira 2014, USA [45]	Primary care clinics – Clinical population	336	White = 251 (74.7); Latino = 85 (25.3)	43.5	M = 104; F = 232	**Anxiety**: PD, GAD, SAD **PTSD**	[a] RCT [b] CBT vs CBT plus medication management	[c] 12 sessions [d] Psychoeducation; self-monitoring; hierarchy development; breathing training; cognitive	BSI-12	No significant differences between White and Latino participants in anxiety symptoms at 6, 12 or 18 months follow up after

								restructuring; exposure to internal and external stimuli.		controlling for baseline differences.
Friedman 1994, USA [31]	Outpatient: Phobia and anxiety clinic – Clinical population	143	White = 100 (69.9); AfAm = 43 (30.1)	White = 38.2; AfAm = 35.2	White: M = 17; F = 83 AfAm: M = 5; F = 38	**Anxiety:** PD; Agoraphobia	[a] Retrospective Chart Review [b] CBT, in vivo exposure (Plus group therapy for extended family members)	[c] Number of sessions not stated [d] Psychoeducation; in vivo exposure. Group therapy focused on educating and involving extended families in treatment.	ADIS-R; MMFQ; ACQ; BSQ; MI	No significant differences between White and AfAm patients in clinician rated clinical improvement at the end of treatment.
Hobfoll 2015, USA [46]	Outpatient - Veterans	303	CBT: White = 154 (73.7); Minority (Asian, Black, Hisp, AmInd) = 55 (26.3) Control: White = 63 (67); Minority (Asian, Black, Hisp, AmInd) = 30 (33)	CBT = 34.2; Control = 34.7	CBT: M = 170; F = 39 Control: M = 77; F = 16	**PTSD**	[a] RCT [b] Online CBT vs AAU	[c] 7 sessions [d] Introduction to CBT approaches; monitoring activities; modifying thoughts and behaviours; understanding emotions; relaxation.	PCL-M; CES-D-10	No significant differences between White and minority participants in reduction of PTSD symptoms at 6 or 12 week follow-up.

Jeffreys 2014, USA [47]	Outpatient Specialty PTSD Clinic - Veterans	263	White = 85 (32.3); AfAm = 23 (9.1); Hisp = 147 (55.9); Asian = 2 (0.8); Other = 4 (1.5)	Overall = 51; PE = 38.2	M = 257; F = 6	**PTSD**	[a] Retrospective chart review [b] Individual and Group CPT vs PE	[c] CPT: 12 sessions; 60 minute individual and 90 minute group sessions; PE: 10-15 weekly 90 minute sessions [d] CPT: Modifying thoughts; written trauma account PE: Psychoeducation; breathing retraining; in vivo and exposures.	PCL; CAPS; MINI for PTSD	No significant differences between White and Hispanic veterans on PTSD measures one month post CPT or PE treatment after adjusting for baseline PTSD scores. AfAm veterans showed a significant reduction in PTSD scores post PE treatment compared to White veterans after adjusting for baseline scores.
Lester 2010, USA [34]	Outpatient – Clinical population	308	White = 214 (69.5); AfAm = 94 (30.5)	White =33; AfAm = 35.4	F = 308	**PTSD**	[a] RCT [b] Combined two studies: 1: CPT vs PE vs WL; 2: CPT vs CPT-C vs WA * Required to be stable on type and dose of medication	[c] Approximately 6 weeks of therapy lasting 12-13 hours. [d] Components of intervention not stated	CAPS; PTSD Symptom Scale - Interview; Post-traumatic Diagnostic Scale	No significant differences between White and AfAms in reduction of PTSD scores post treatment or at 3-6 months follow-up.
Markell 2014, USA [38]	Outpatient – Clinical population	25	EuAm = 17 (68); AfAm = 8 (32)	EuAm = 48 AfAm = 44;	EuAm: M = 9; F = 8 AfAm:	**Anxiety:** GAD	[a] RCT [b] CBT plus medication	[c] 12 sessions [d] Applied relaxation; self-monitoring of	HAM-A; HAM-D	No significant differences between EuropAms and AfAms in reduction of anxiety scores

					F = 8;			thoughts, emotions, somatic symptoms; diaphragmatic breathing; progressive relaxation; coping statements; modifying thoughts and core beliefs; thinking errors; behavioural experiments.		between baseline and post treatment.
Smits 2013, USA [48]	Outpatient - Clinical population	169	White = 104 (61.5); Hisp = 18 (10.7); AfAm = 16 (9.5); Asian = 20 (11.8); Other = 11 (6.6)	32.6	M = 96; F = 73	**Anxiety:** SAD	[a] RCT (double blinded) [b] D-Cycloserine augmented Group CBT vs Placebo augmented Group CBT	[c] 12 weeks; 2.5 hour group sessions [d] Psychoeducation; cognitive restructuring; practice exposure; repeated exposure.	LSAS	Significant differences between AfAm and non-White participants in anxiety scores post treatment, controlling for the effects of initial severity. AfAms showed greater improvement and had lower anxiety scores post treatment.
Stecker 2016, USA [49]	Outpatient - Veterans	228	White =190 (83.3); Black = 38 (16.7)	White= 29; Black = 31.1	White: M = 171; F = 19 Black: M = 26;	**PTSD**	[a] CCT [b] Telephone CBT vs Control condition	[c] 45 to 60 minute sessions; Average number of sessions: Black = 2.1, White = 3.8	PCL; PHQ-9[1]	No significant differences between White and Black participants in reduction of PTSD

					F = 12			[d] Thought modification (maximum of three beliefs)		symptoms (baseline to 6 months).
Zoellner 1999, USA [33]	Outpatient: Academic setting - Female assault victims	95	White = 60 (63); AfAm = 35 (37)	34.8	F = 95	**PTSD**	[a] CCT [b] PE, Stress Inoculation Training (SIT), combination program (PE and SIT elements) vs WL	[c] 9 sessions twice weekly; two 120 minute sessions; seven 90 minute sessions [d] PE: Imaginal exposure; SIT: anxiety management skills; breathing retraining; thought stopping; cognitive restructuring; positive affirmations; problem solving; Combination program included PE and SIT elements.	PSS-I; BDI; STAI	No significant differences between White and AfAm participants PTSD scores post treatment or at 12 months follow up, after controlling for baseline symptom severity.
Anxiety & Depression Studies										
Clark 2009, UK [50]	Outpatient - Clinical population (Newham site only)	249	White = 127 (51); Minority (Asian, Black, Other) = 122 (49)	Range = 18-64; (< 4% under 18 or over 65 years)	M = 149; F = 100	**Anxiety**; **Depression**	[a] Cohort [b] CBT, Group CBT, GSH, CCBT *At least 20% taking psychotropic	[c] Average length of face to face sessions = 47 minutes; Average of 8.2 sessions; Low Intensity treatment: GSH Workbooks, CCBT,	PHQ-9[2]; GAD-7; CORE OM	No significant differences between White and non-White patients for change in anxiety or depression scores post treatment. No

							medication (SSRIs most common)	Group psychoeducation. High Intensity treatment: 1:1 CBT [d] Components of CBT intervention not stated		ethnic difference in recovery rates.
Friedman 2003, USA [40]	Outpatient: Anxiety disorder clinic – Clinical population	62	White = 36 (58); AfAm = 26 (42)	White = 38.6; AfAm = 40.5	White: M = 18; F = 18 AfAm: M = 2; F = 24	**Anxiety:** OCD, PD; **Depression**	[a] Naturalistic Study [b] ERP; CBT for panic initially for patient with panic attacks. *64% White and 68% AfAms receiving medication (SSRIs)	[c] Treatment between 1992-1998; Average of 20 sessions (range 3 to 80); Sessions twice per week for 45 to 90 minute session. [d] Psychoeducation, anxiety management, behavioural experiments, in vivo and imaginal exposure.	Y-BOCS; BDI	No significant differences between White and AfAm patients in reduction of anxiety scores between baseline and post treatment. No significant differences between White and AfAm patients in reduction of depression scores between baseline and post treatment.
Friedman 2006, USA [39]	Outpatient: Community anxiety disorder clinic – Clinical population	40	White = 16 (40); AfAm = 24 (60);	Overall = 39.7; White = 34.8 AfAm = 43;	M = 8; F = 32	**Anxiety:** PD, agoraphobia; **Depression**	[a] Naturalistic Study [b] Interoceptive & in vivo exposure *72.5% received medication during course of treatment	[c] Treatment between 1995-1999; Mean of 16.2 sessions (range 4 to 61); Patient and clinician decided when patient reached maximum gains.	FQ; ACQ; BSQ; MI; BDI	No significant differences between White and AfAm patients in anxiety scores post treatment after controlling for pre-test scores.

								[d] Psychoeducation; relaxation training; cognitive coping strategies; interoceptive exposure; in vivo exposure.		Significant differences between White and AfAm patients in depression scores post treatment (controlling for pre-test scores). AfAms had significantly higher depression scores.
Horrell 2014, UK [51]	Outpatient: Community setting – Community sample	458	White = 313 (68); Black = 67 (15); Asian = 48 (11); Mixed = 22 (5) Other = 8 (2)	44.1	M = 92; F = 366	**Anxiety; Depression**	[a] RCT [b] Group CBT vs WL	[c] 7 hours over 4 sessions plus 2 hour booster session one month later. [d] Psychoeducation self-confidence workshop; identifying and challenging negative thoughts; problem solving and assertiveness.	BDI; GAD-7	No significant differences between White and non-White participants in depression scores at 12 week follow up, after controlling for baseline depression scores. No ethnic comparisons for anxiety scores.
Jonassaint 2017, USA [52]	Outpatient: Primary care – Clinical population	590	White = 499 (84.6); AfAm = 91 (15.4)	White = 43.6 AfAm = 39.9	White: M = 414; F = 85 AfAm: M = 12; F = 79	**Anxiety; Depression**	[a] RCT [a] CCBT and CCBT with Internet Support Group. Required to be medically stable	[c] Eight 50 minute sessions [d] Thought labelling; activity scheduling; problem solving; homework.	PHQ-9; GAD-7	No significant differences between White and AfAm patients in anxiety or depression change scores.
Tang 2016, USA [53]	Inpatient: Acute psychiatric partial	86	White = 43 (50);	White = 30	M = 28; F = 58	**Anxiety; Depression**	[a] Cohort analytic	[c] Five 45-50 minute skills groups; 30 minutes 1:1	BASIS-24; CESD-10; PSWQ-A	No significant differences between White and AsAm

	hospital - Clinical population		AsAm = 43 (50)	AsAm = 30			[b] Group CBT, 1:1 CBT plus Medication management	sessions 3 times per week (over an average of 7 days) to practice CBT skills; medication management 2-3 times per week. [d] Cognitive restructuring; behavioural activation; thought challenging.		patients in reduction of anxiety or depression scores between baseline and post treatment.

Notes: Caucasian/Non-Hispanic White has been recoded as White; Hispanic White has been recoded as Hispanic.

Abbreviations: AfAm: African American; AmInd: American Indian; AsAm: Asian American; EuAm: European American; Hisp: Hispanic; SES: Socio-economic status; GAD: Generalised Anxiety Disorder; OCD: Obsessive Compulsive Disorder (OCD); PD: Panic Disorder; PTSD: Post Traumatic Stress Disorder; SAD: Social Anxiety Disorder; AAU: Adjustment as usual; CBT: Cognitive Behavioural Therapy; CCBT: Computerised CBT; CCT: Controlled Clinical Trial; CPT: Cognitive Processing Therapy; CPT-C: Cognitive Processing Therapy – Cognitive Therapy only; ERP: Exposure and response prevention; GSH: Guided Self Help; IPT: Interpersonal psychotherapy; PE: Prolonged Exposure; RCT: Randomised controlled trial; SP: Supportive psychotherapy; SWI: Supportive Psychotherapy with Imipramine; TAU: Treatment as usual; WA: Written Accounts; WL: Wait list condition; ACQ: Agoraphobic Cognitions Questionnaires; ADIS-R: Anxiety Disorder Interview Schedule – Revised; BASIS-24: Behaviour & Symptom Identification Scale; BAT: Behavioural Avoidance Test; BDI: Beck Depression Inventory; BSI-12: 12-item Brief Symptom Inventory; BSQ: Body Sensations Questionnaire; CAPS: Clinician Administered PTSD Scale; CESD-10: Centre for the Epidemiological Studies of Depression-10; CORE-OM: CORE Outcome Measure; FQ: Fear Questionnaire; GAD-7: Generalised Anxiety Disorder Scale; HAM-A: Hamilton Anxiety Rating Scale; HAM-D: Hamilton Depression Rating Scale; LSAS: Liebowitz Social Anxiety Scale; MI: Mobility Inventory; MINI: Mini Neuropsychiatric Interview for PTSD; MMFQ: Marks and Mathews Fear Questionnaire; MPR: Main Phobia Rating; PCL: PTSD Checklist; PCL-M: PTSD Checklist Military Version; PHQ-9[1]: Physicians Health Questionnaire; PHQ-9[2]: Patient Health Questionnaire Depression Scale; PSS-I: PTSD Symptom Scale Interview; PSWQ-A: Penn State Worry Questionnaire; STAI: State-Trait Anxiety Inventory; Y-BOCS: Yale Brown Obsessive Compulsive Scale.

4.6. Quality Assessment of Studies

Table 2 summarises the global quality ratings for each of the included studies.

Table 2: Global quality ratings of included studies

First Author, Year	Domains with Weak ratings	Global Quality Rating
Chambless, 1995	Selection bias	*Moderate*
	Blinding domain not applicable	
Chavira, 2014	Withdrawals and dropouts	*Moderate*
Clark, 2009	Confounders	*Weak*
	Withdrawal and dropouts	
	Blinding domain not applicable	
Friedman, 1994	Data collection methods	*Moderate*
	Blinding domain not applicable	
Friedman, 2003	None	*Strong*
Friedman, 2006	Data collection methods	*Moderate*
	Blinding domain not applicable	
Hobfoll, 2015	None	*Strong*
Horrell, 2014	Blinding	*Moderate*
Jeffreys, 2014	Study design	*Weak*
	Data collection methods	
	Withdrawal and dropouts	
	Blinding domain not applicable	
Jonassaint, 2017	Withdrawals and dropouts	*Moderate*
Lester, 2010	None	*Strong*
Markell, 2014	Selection bias	*Moderate*
Smits, 2013	None	*Strong*
Stecker, 2016	Confounders	*Weak*
	Blinding	
	Withdrawal and dropouts	
Tang, 2016	Withdrawals and dropouts	*Moderate*
	Blinding domain not applicable	
Zoellner, 1999	None	*Strong*

Most studies (n = 8) [28, 31, 38, 39, 45, 51-53] were rated as 'Moderate' in quality, five studies were rated as 'Strong' [33, 34, 40, 46, 48] and three were rated as 'Weak' [47, 49, 50].

Of the studies rated as 'Moderate' in quality, two of these studies [28, 38] were considered to have a selection bias. In Chambless and colleagues' 1995 study [28], participants were recruited from a single source and the percentage of individuals agreeing to participate in the study could not be determined. In the second study, Markell and colleagues (2014) [38] reported that less than 60% of selected individuals agreed to participate. Three studies [45, 52, 53] did not report the withdrawals and drop-out numbers and/or reasons. Two studies [31, 39] did not describe the validity and reliability of data collection tools and in one study [51], there was no 'blinding' of research participants.

Of the three studies rated as 'Weak' in quality, Jeffreys and colleagues (2014) [47] did not describe the validity and reliability of data collection tools and the study had a follow up rate of less than 60%; Stecker and colleagues (2016) [49] did not describe the control of confounders, outcome assessors were aware of the intervention, participants were aware of the research question and withdrawal/dropout rates were not described; and Clark and colleagues (2009) [50] did not describe confounders and withdrawal/dropout rates.

In summary, most of the included studies comparing CBT treatment outcomes by ethnicity were either Strong or Moderate in quality. There were a range of reasons why studies were rated as Weak in quality, namely study design, description of confounders, withdrawal/dropout rates, data collection methods and blinding of outcome assessors and/or study participants.

4.7. Review question: Do ethnic minority groups have poorer CBT treatment outcomes for anxiety disorders, PTSD or depression compared to their White counterparts?

Table 1 summarises the results of treatment outcome comparisons by ethnicity for each of the included studies. Treatment outcomes are discussed below according to the diagnostic focus of the studies.

4.7.1. Anxiety and PTSD studies

4.7.1a. Studies reporting no significant differences by ethnicity

Seven of the included studies comparing treatment outcomes for anxiety disorders or PTSD reported no significant differences between White majority and ethnic minority participants. Most of these seven studies were conducted in outpatient clinical settings except for one study that was conducted in an academic setting [33]. Treatments were delivered face to face, online or by telephone and the number of sessions ranged between 7 and 12. All but one of these studies were either randomised controlled trials or controlled clinical trials. Most examined the reduction in symptom scores at the end of treatment, with post treatment follow up periods ranging from 6 weeks to 12 months. Two studies controlled for baseline differences and examined differences in scores between 6 to 18 months follow up [33, 45].

Although Chavira and colleagues (2014) found no ethnic differences in anxiety symptoms, Latinos indicated more favourable scores in overall mental health functioning at follow up [45]. In this study, participants randomised to the intervention arm chose their preferred treatment option and no significant differences in treatment

preferences by ethnicity (Latinos versus Non-Latino Whites) were found. The analytic sample included participants who had received both CBT and CBT plus medication making it impossible for the authors to assess the effects of CBT alone. It is also important to note that the study was not designed to look at ethnic differences and analyses were conducted post-hoc. A similar issue with medication was observed in Markell and colleagues' (2014) study where participants received combined CBT and medication treatment for GAD [38]. Additionally, eight African American Females were compared to 17 European Americans. Therefore, there are questions about the generalisability of the findings and whether the analyses had sufficient power to detect differences in treatment outcome by ethnicity.

Lester and colleagues (2010) combined two separate studies assessing different treatments (CPT and PE) in order to provide a sufficient sample size for analysis [34]. Although they found no significant differences in anxiety reduction between White and African American participants, the authors reported that African Americans were less likely to complete treatment and those who dropped out showed more improvement in symptoms than White participants who dropped out. Neither of the combined studies were originally designed to assess the impact of ethnicity on treatment outcomes. Moreover, the combination of the two studies made it impossible for the authors to examine differences between treatment conditions by ethnicity.

Zoellner and colleagues (1999) reported no difference in overall treatment efficacy after controlling for baseline symptom severity [33]. Similar to the aforementioned studies, three active treatment groups were combined to allow comparison between White and

African American participants. Despite the combination of treatment groups, there was no power analysis conducted and the number of African Americans in the study was low (n = 35). Hobfoll and colleagues' (2015) study was also exploratory and the analyses were conducted post hoc [46]. Stecker and colleagues (2016) reported a significant reduction in PTSD symptoms over time, with no significant differences between White and Black participants [49]. However, it should be noted that White participants were shown to have higher PTSD symptoms scores at baseline and attended more treatment sessions than Black participants.

The final study to report no significant differences in anxiety or PTSD symptoms was a retrospective chart review by Friedman and colleagues (1994) [31]. Clinical improvement was rated by an independent assessor and a near perfect agreement of 0.96 between assessors was reported. There were no significant group differences in clinician rated clinical improvement at the end of treatment, with 70% of African American and 79% of White patients rated as moderately or significantly improved. Although the study reported no significant differences between the ethnic groups in their baseline self-rated scores, they did not present tables showing the ratings of clinical improvement. It is also important to note that whilst assessors were blinded to the purpose of the study, they were not blinded to patients' ethnicity.

4.7.1b. Studies reporting significant differences by ethnicity

Two of the identified studies, a cohort study and a RCT, reported a significant difference in treatment outcome between White and ethnic minority groups. Both studies took place in outpatient clinical settings, treatment was delivered face to face and total number of sessions ranged from 10 to 12. Follow up periods were 6 months and 13 weeks respectively. Chambless and colleagues (1995) reported significant differences between White and African American participants in the amount of change on anxiety measures at post treatment or follow up, after controlling for socio-economic status [28]. However, the small sample size of African Americans (n= 15) was a notable limitation of this study. Smits and colleagues (2013) compared medication augmented CBT to placebo augmented CBT and the effect of ethnicity was examined across both treatment conditions [48]. The study found that African Americans showed greater improvement during treatment and had lower anxiety scores post treatment (controlling for the effects of initial severity) than patients from other ethnic groups (White, Hispanic, Asian, Other). However, for both treatment conditions the effect of CBT alone could not be determined.

4.7.1c. Studies reporting both significant and non-significant differences

The final study comparing treatment outcomes by ethnicity for PTSD reported mixed results. Jeffreys and colleagues' (2014) study was a retrospective chart review in which veterans were allocated to treatment condition (CPT or PE) based on the preference of patients and clinicians [47]. This study reported no significant differences in PTSD scores between White and Hispanic veterans post CPT or PE treatment after adjusting for baseline scores. However, African Americans were found to have significantly better

outcomes on PTSD measures post PE treatment compared to other ethnic groups (White, Hispanic, Asian, Other), after adjusting for baseline scores. However, it should be noted that treatment allocation was not randomised, potential differences in treatment preference were not examined and there was no information on concurrent medication treatment.

4.7.2 Anxiety and Depression studies

4.7.2a. Studies reporting no significant differences by ethnicity

Five of the included studies reported no significant differences in treatment outcome by ethnicity. Two of these studies were RCTs, two were cohort/cohort analytic studies and one was described as a naturalistic study. All five studies assessed the reduction in symptom scores. Follow up periods for studies conducted in the community ranged from 3 to 6 months (not stated for two studies) and 7 days for the study that took place in an inpatient setting. Treatments in these five studies were either individual or group sessions and were delivered face to face or online.

Clark and colleagues (2009) found no significant differences in anxiety or depression change scores between White and minority (Asian, Black, Other) patients in a UK mental health service [50]. In Friedman and colleagues' (2003) study, there was a broad range in number of treatment sessions (from 3 to 80), post treatment scores were rated by the treating clinician and the treatment delivered was not manualised [40]. Moreover, African American and Caribbean patients were placed in the same group in order to create a group large enough for comparison. As mentioned in other studies, ethnic comparisons were not the focus of Horrell and colleagues' (2014) study and analyses

were conducted post hoc [51]. Jonassaint and colleagues (2017) combined participants who received online CBT (CCBT) with those who received CCBT with Internet Support [52]. The study reported no significant differences in symptom improvements between the two treatment groups. However, differences in baseline scores between the treatment groups were not reported and it is likely that the groups were combined to create a sufficient sample size for analysis.

The fifth study by Tang and colleagues (2016) took place in an inpatient setting providing intensive treatment over a short period [53]. The study reported no significant differences between White and Asian American patients in reduction of anxiety or depression scores. However, it should be noted that White patients endorsed higher symptoms severity compared to Asian American patients at both pre and post treatment. The study was also unable to assess the impact of language barriers or cultural differences that may have existed among the ethnic minority group. Finally, the effect of CBT alone is unknown as patients received concurrent medication treatment during their stay.

4.7.2b. Studies reporting both significant and non-significant differences

The final anxiety/depression study conducted by Friedman and colleagues (2006) reported mixed findings [39]. In this naturalistic study, there were no significant differences between White and African American patients in anxiety scores post treatment, after controlling for baseline scores. However, African Americans were found to have significantly higher depression scores at post-treatment after adjustment for baseline severity. As observed in other included studies with a similar design, there was

a wide range in the number of treatment sessions attended (range = 4 to 61), the treatment was not manualised, and the effects of prior medication treatment on CBT treatment outcome is unknown.

4.7.3 Summary of CBT outcomes by ethnicity

Of the 16 studies included in this review, the majority of the evidence suggests that CBT for anxiety disorders, PTSD or depression may be an equally effective treatment for ethnic minority groups as it is for individuals from White majority backgrounds. Ten US studies and two UK studies reported no significant differences between White and ethnic minority participants.

Two studies reported poorer treatment outcomes for African Americans compared with their White counterparts. The first found that African Americans showed less improvement in anxiety symptoms following in vivo exposure for agoraphobia and panic disorder [28]. The second found that this ethnic group also had significantly higher depression symptoms (adjusting for baseline severity) compared to White patients following interoceptive and in vivo exposure for agoraphobia and panic disorder [39]. In contrast, two studies reported better treatment outcomes for African Americans compared to other ethnic groups. African Americans receiving group CBT for social anxiety were found to have greater improvement rates and lower scores on anxiety measures than patients from White, Hispanic, Asian or Other backgrounds [48]. African Americans also had significantly better outcomes on PTSD measures following PE

treatment compared to individuals from White, Hispanic, Asian or Other backgrounds (adjusting for baseline scores) [47].

5. Discussion

5.1. Overview of results

The primary aim of this systematic review was to ascertain whether individuals from ethnic minority groups have poorer CBT treatment outcomes compared to their White counterparts. Data were gathered from 16 studies involving 3, 413 participants. Most of the evidence reviewed showed no differences in CBT treatment outcomes for anxiety disorders, PTSD and/or depression between ethnic minority and White majority participants. In ten studies conducted in the United States, African American, Hispanic, Latino, Asian American and American Indian individuals yielded comparable benefits to those observed in White European/American individuals following CBT treatment for these common mental health problems. Although only two non-US studies were identified, both in the UK, a similar pattern was found; there were no differences in CBT treatment outcomes between White British and Black and minority ethnic groups [50, 51].

In two studies, African Americans were shown to derive better treatment outcomes than White majority groups and other ethnic minority groups. African Americans receiving cognitive and/or behavioural treatment for social anxiety and PTSD showed greater improvement in anxiety symptoms compared to individuals from White, Hispanic, Asian or Other backgrounds [47, 48]. Poorer treatment outcomes for ethnic minority participants were only reported in two of the included studies. Ethnic differences emerged in the treatment of agoraphobia and panic disorder among African American participants, who were found to be more symptomatic following interoceptive and in vivo exposure [28, 39].

5.2. Methodological quality of included studies

Nine of the included studies were either randomised controlled trials (RCT) or controlled clinical trials (CCT); designs often considered to be the gold standard of effectiveness or efficacy studies. The two studies reporting poorer treatment outcomes for African Americans (Chambless and colleagues, 1995; Friedman and colleagues, 2006) were cohort and naturalistic studies respectively [28, 39]. The two studies reporting better outcomes for African American participants (Jeffreys and colleagues, 2014; Smits and colleagues, 2013) were a retrospective chart review and an RCT respectively [47, 48]. Follow up periods across all the studies taking place in outpatient settings ranged from 6 weeks to up to 18 months. Although 13 of the 16 included studies were rated as either Strong or Moderate in quality using the EPHPP quality tool (see appendix 3 for complete ratings), several methodological issues were observed and should be considered when interpreting the findings.

Firstly, a majority of studies (at least 8) were not designed to investigate ethnic differences in treatment outcomes [31, 33, 34, 45-47, 51, 52]. Consequently, analyses were conducted post hoc and the findings were typically described as either preliminary or exploratory. At least four of these studies combined participants from different treatment conditions making it impossible to examine potential ethnic differences within each condition [33, 34, 45, 52]. In other studies, participants from different ethnic minority backgrounds were collapsed to create a comparison group [33, 40]. It is known that there are differences in the risk factors and life experiences between individuals from different ethnic minority backgrounds [13, 29]. Differences in treatment outcomes between these ethnic minority groups in these studies could not be explored. Of greater

concern is one study that combined participants from two different studies that were not originally designed to assess ethnic differences [34]. Important differences between the study cohorts may have reduced the likelihood of detecting differences in treatment outcomes by ethnicity.

Participants in at least ten of the included studies were receiving concurrent medication treatment and this information was not stated in five studies. The effects of concurrent medication treatment in these studies could not be determined and more importantly, the effectiveness of CBT treatment alone remains unknown. Assessment of treatment adherence could only be ascertained in four of the included studies. Additionally, the two studies with a naturalistic design did not follow a manualised approach and treatment sessions ranged from 3 to 80 in one study and from 4 to 61 in the other [39, 40]. Participants remained in treatment until maximum treatment gains were achieved and in one of these studies post treatment scores were rated by the treating clinician. The possibility that both White and ethnic minority participants achieved maximum gains before a decision was made to end treatment cannot be ruled out. Moreover, clinicians' ratings of symptom reduction are likely to be biased.

Small sample sizes and the underrepresentation of particular groups (e.g. African Americans and African American men) were also issues in some of the included studies [28, 33, 38]. Power analyses were rarely conducted or reported [33]. In the study conducted by Jeffreys and colleagues (2014) [47], there was an allocation bias as participants and clinicians were allocated to treatment condition based on expressed

preferences. At the same time, the strict inclusion criteria applied in some RCTs may limit the findings to groups with a less severe presentation.

5.3. Strengths and limitations of the review

This review excluded studies that recruited a sample based on having a co-occurring mental or physical health problem (e.g. PTSD and substance misuse or depression in Parkinson's/HIV). Therefore, it was unable to comment on whether ethnic differences in CBT treatment outcomes for anxiety disorders, PTSD or depression exist for individuals with co-occurring conditions. It has however been previously noted that studies with specialised populations, such as patients with HIV experiencing depression, have shown contradictory results [2, 32]. Future research should seek to further investigate factors contributing to differential treatment outcomes among specialised populations.

As noted in a review by Miranda and colleagues (2005) [2], the current review also found that studies involving American Indian participants were lacking. As only two non-US studies were identified, CBT outcomes for different ethnic minority groups outside of the US also require urgent research. Finally, this review was unable to assess how cultural modifications may contribute to or enhance the effectiveness of CBT treatment as this information was not always available in the included studies. This issue has been previously highlighted and remains an area for further exploration [2, 12].

This systematic review addresses the call for further research analysing treatment outcomes by ethnicity [11]. It adds to the existing literature by investigating whether disparities in CBT treatment outcomes for anxiety, PTSD and/or depression are found between ethnic minority groups and individuals from White majority groups. The inclusion of studies involving participants from Asian American and Hispanic/Latino populations is of importance in the review, as these groups have been previously underrepresented in the treatment outcome literature [11, 36, 37].

This review was further able to comment on CBT treatment outcomes for ethnic minority groups in relation to their White counterparts in both the UK and US context. To our knowledge, this is the first known review to include ethnic comparisons for CBT treatment outcomes in both countries. The identification of only two studies conducted in the UK brings focus to the dearth of such studies in this country and other non-US countries. In the UK, approximately 1.44 million referrals are made to Improving Access to Psychological Therapies (IAPT) services per year according to the latest figures and there is an increased effort to improve the transparency of treatment outcomes in mental health services [54, 55]. Lastly, the review was able to examine and summarise the methodological quality of the identified studies.

5.4. Implication of findings

The findings of this systematic review support existing research which suggests that CBT treatment for ethnic minority groups may deliver comparable results to those observed among individuals from White majority groups [2, 7, 11]. Whilst the results of studies involving individuals from African American, Asian and Hispanic/Latino backgrounds are

encouraging, further research is required to determine whether CBT can be considered an intervention that is consistently effective among these groups [12].

The finding that African Americans obtain greater benefits from treatments such as group CBT for social anxiety and PE for PTSD compared to individuals from White, Hispanic, Asian or Other ethnic backgrounds is noteworthy. Similarly, the finding that African Americans had poorer treatment outcomes following interoceptive and in vivo exposure treatment of agoraphobia and panic disorder requires further investigation. Increased experiences of trauma and adverse life events among ethnic minority groups have previously been attributed to the poorer treatment outcomes observed among this client group [27]. Factors such as experienced or anticipated discrimination, racism or migration are also known to impact risk of mental health problems among ethnic minority groups as well as access to mental health services [56-58]. Such factors should be explored as potential contributing factors to differences in CBT treatment outcomes observed among ethnic minority groups.

The study reporting that African American participants were more likely to drop out of treatment also reported that they showed more improvement in symptoms than White participants who dropped out [34]. Whilst it has been suggested that African Americans may have a tendency to achieve early treatment gains and therefore discontinue treatment following improvement [11], this notion requires further exploration in future research and has implications for the contracting of number of treatment sessions offered to specific groups. It may also be helpful for clinicians to provide further support and additional information to individuals from ethnic minority backgrounds, particularly

African Americans, about the benefits of completing a course of psychological treatment. Early disengagement from psychological therapy reduces opportunities for relapse prevention and for the maximum benefits to be achieved.

As previously noted, the lack of studies comparing CBT treatment outcomes by ethnicity outside of the US is worth further exploration. Finally, it is important to bring attention to the methodological issues identified among the included studies. Whilst quality assessment tools may aid in assessing important domains, they may not fully capture the methodological quality of studies. Based on the findings of the quality of the studies included in this review, future studies seeking to compare CBT treatment outcomes by ethnicity should seek to recruit a representative sample of ethnic minority participants that is sufficiently powered to detect potential differences. Additionally, studies should aim to employ a standardised treatment manual and clearly document whether interventions have been adapted for specific ethnic minority groups. Further research is required in order to ascertain how specific cultural adaptations to CBT treatment enhance effectiveness among particular ethnic groups. The effects of con-current medication treatment were not examined in many of the included studies. This is an important consideration if the effectiveness of CBT alone and any potential differences in treatment outcomes by ethnicity are to be more fully understood.

5.5. Conclusions

Most of the studies included in this review reported no significant differences in CBT treatment outcomes for anxiety disorders, PTSD and/or depression between ethnic minority groups and their White counterparts. The four studies reporting significant

differences have mixed findings: two studies reported poorer treatment outcomes for African American participants than White individuals whereas two studies reported greater improvement in symptoms among African American individuals.

The methodological quality of the studies should be taken into consideration when interpreting the findings of the studies included in this review. An important limitation is that many of the included studies were not originally designed to assess or compare differences in treatment outcomes by ethnicity. Most of the analyses in such studies were conducted post hoc and are described as exploratory. Many did not include a power calculation and may have been under-powered to find a group difference. Future studies should seek to address the study limitations by involving larger and representative samples of ethnic minority participants so that important differences in CBT treatment outcomes by ethnicity can be fully investigated.

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7. Appendices

Appendix 1: *EPHPP Quality Assessment Tool for Quantitative Studies*

QUALITY ASSESSMENT TOOL FOR QUANTITATIVE STUDIES

EPHPP
Effective Public Health Practice Project

COMPONENT RATINGS

A) SELECTION BIAS

(Q1) Are the individuals selected to participate in the study likely to be representative of the target population?

1 Very likely
2 Somewhat likely
3 Not likely
4 Can't tell

(Q2) What percentage of selected individuals agreed to participate?

1 80 - 100% agreement
2 60 – 79% agreement
3 less than 60% agreement
4 Not applicable
5 Can't tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

B) STUDY DESIGN

Indicate the study design

1 Randomized controlled trial
2 Controlled clinical trial
3 Cohort analytic (two group pre + post)
4 Case-control
5 Cohort (one group pre + post (before and after))
6 Interrupted time series
7 Other specify _____
8 Can't tell

Was the study described as randomized? If NO, go to Component C.

No Yes

If Yes, was the method of randomization described? (See dictionary)

No Yes

If Yes, was the method appropriate? (See dictionary)

No Yes

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

C) CONFOUNDERS

(Q1) Were there important differences between groups prior to the intervention?

1 Yes
2 No
3 Can't tell

The following are examples of confounders:

1 Race
2 Sex
3 Marital status/family
4 Age
5 SES (income or class)
6 Education
7 Health status
8 Pre-intervention score on outcome measure

(Q2) If yes, indicate the percentage of relevant confounders that were controlled (either in the design (e.g. stratification, matching) or analysis)?

1 80 – 100% (most)
2 60 – 79% (some)
3 Less than 60% (few or none)
4 Can't Tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

D) BLINDING

(Q1) Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants?

1 Yes
2 No
3 Can't tell

(Q2) Were the study participants aware of the research question?

1 Yes
2 No
3 Can't tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

E) DATA COLLECTION METHODS

(Q1) Were data collection tools shown to be valid?

1 Yes
2 No
3 Can't tell

(Q2) Were data collection tools shown to be reliable?

1 Yes
2 No
3 Can't tell

RATE THIS SECTION	STRONG	MODERATE	WEAK
See dictionary	1	2	3

F) WITHDRAWALS AND DROP-OUTS

(Q1) Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group?

1 Yes
2 No
3 Can't tell
4 Not Applicable (i.e. one time surveys or interviews)

(Q2) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest).

1 80 -100%
2 60 - 79%
3 less than 60%
4 Can't tell
5 Not Applicable (i.e. Retrospective case-control)

RATE THIS SECTION	STRONG	MODERATE	WEAK	
See dictionary	1	2	3	Not Applicable

G) INTERVENTION INTEGRITY

(Q1) What percentage of participants received the allocated intervention or exposure of interest?

1 80 -100%
2 60 - 79%
3 less than 60%
4 Can't tell

(Q2) Was the consistency of the intervention measured?

1 Yes
2 No
3 Can't tell

(Q3) Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results?

4 Yes
5 No
6 Can't tell

H) ANALYSES

(Q1) Indicate the unit of allocation (circle one)

community organization/institution practice/office individual

(Q2) Indicate the unit of analysis (circle one)

community organization/institution practice/office individual

(Q3) Are the statistical methods appropriate for the study design?

1 Yes
2 No
3 Can't tell

(Q4) Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received?

1 Yes
2 No
3 Can't tell

GLOBAL RATING

COMPONENT RATINGS
Please transcribe the information from the gray boxes on pages 1-4 onto this page. See dictionary on how to rate this section.

A	**SELECTION BIAS**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	
B	**STUDY DESIGN**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	
C	**CONFOUNDERS**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	
D	**BLINDING**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	
E	**DATA COLLECTION METHOD**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	
F	**WITHDRAWALS AND DROPOUTS**	**STRONG**	**MODERATE**	**WEAK**	
		1	2	3	Not Applicable

GLOBAL RATING FOR THIS PAPER (circle one):

1	STRONG	(no WEAK ratings)
2	MODERATE	(one WEAK rating)
3	WEAK	(two or more WEAK ratings)

With both reviewers discussing the ratings:

Is there a discrepancy between the two reviewers with respect to the component (A-F) ratings?

No Yes

If yes, indicate the reason for the discrepancy

1	Oversight
2	Differences in interpretation of criteria
3	Differences in interpretation of study

Final decision of both reviewers (circle one):

1	**STRONG**
2	**MODERATE**
3	**WEAK**

Appendix 2: *EPHPP Quality Assessment Tool for Quantitative Studies Dictionary*

Quality Assessment Tool for Quantitative Studies Dictionary

The purpose of this dictionary is to describe items in the tool thereby assisting raters to score study quality. Due to under-reporting or lack of clarity in the primary study, raters will need to make judgements about the extent that bias may be present. When making judgements about each component, raters should form their opinion based upon information contained in the study rather than making inferences about what the authors intended. Mixed methods studies can be quality assessed using this tool with the quantitative component of the study.

A) SELECTION BIAS

(Q1) Participants are more likely to be representative of the target population if they are randomly selected from a comprehensive list of individuals in the target population (score very likely). They may not be representative if they are referred from a source (e.g. clinic) in a systematic manner (score somewhat likely) or self-referred (score not likely).

(Q2) Refers to the % of subjects in the control and intervention groups that agreed to participate in the study before they were assigned to intervention or control groups.

B) STUDY DESIGN

In this section, raters assess the likelihood of bias due to the allocation process in an experimental study. For observational studies, raters assess the extent that assessments of exposure and outcome are likely to be independent. Generally, the type of design is a good indicator of the extent of bias. In stronger designs, an equivalent control group is present and the allocation process is such that the investigators are unable to predict the sequence.

Randomized Controlled Trial (RCT)

An experimental design where investigators randomly allocate eligible people to an intervention or control group. A rater should describe a study as an RCT if the randomization sequence allows each study participant to have the same chance of receiving each intervention and the investigators could not predict which intervention was next. If the investigators do not describe the allocation process and only use the words 'random' or 'randomly', the study is described as a controlled clinical trial.

See below for more details.

Was the study described as randomized?

Score YES, if the authors used words such as random allocation, randomly assigned, and random assignment.

Score NO, if no mention of randomization is made.

Was the method of randomization described?

Score YES, if the authors describe any method used to generate a random allocation sequence.

Score NO, if the authors do not describe the allocation method or describe methods of allocation such as alternation, case record numbers, dates of birth, day of the week, and any allocation procedure that is entirely transparent before assignment, such as an open list of random numbers of assignments.
If NO is scored, then the study is a controlled clinical trial.

Was the method appropriate?

Score YES, if the randomization sequence allowed each study participant to have the same chance of receiving each intervention and the investigators could not predict which intervention was next. Examples of appropriate approaches include assignment of subjects by a central office unaware of subject characteristics, or sequentially numbered, sealed, opaque envelopes.

Score NO, if the randomization sequence is open to the individuals responsible for recruiting and allocating participants or providing the intervention, since those individuals can influence the allocation process, either knowingly or unknowingly.

If NO is scored, then the study is a controlled clinical trial.

Controlled Clinical Trial (CCT)
An experimental study design where the method of allocating study subjects to intervention or control groups is open to individuals responsible for recruiting subjects or providing the intervention. The method of allocation is transparent before assignment, e.g. an open list of random numbers or allocation by date of birth, etc.

Cohort analytic (two group pre and post)
An observational study design where groups are assembled according to whether or not exposure to the intervention has occurred. Exposure to the intervention is not under the control of the investigators. Study groups might be non-equivalent or not comparable on some feature that affects outcome.

Case control study
A retrospective study design where the investigators gather 'cases' of people who already have the outcome of interest and 'controls' who do not. Both groups are then questioned or their records examined about whether they received the intervention exposure of interest.

Cohort (one group pre + post (before and after)
The same group is pretested, given an intervention, and tested immediately after the intervention. The intervention group, by means of the pretest, act as their own control group.

Interrupted time series
A study that uses observations at multiple time points before and after an intervention (the 'interruption'). The design attempts to detect whether the intervention has had an effect significantly greater than any underlying trend over time. Exclusion: Studies that do not have a clearly defined point in time when the intervention occurred and at least three data points before and three after the intervention

Other:
One time surveys or interviews

C) CONFOUNDERS

By definition, a confounder is a variable that is associated with the intervention or exposure and causally related to the outcome of interest. Even in a robust study design, groups may not be balanced with respect to important variables prior to the intervention. The authors should indicate if confounders were controlled in the design (by stratification or matching) or in the analysis. If the allocation to intervention and control groups is randomized, the authors must report that the groups were balanced at baseline with respect to confounders (either in the text or a table).

D) BLINDING

(Q1) Assessors should be described as blinded to which participants were in the control and intervention groups. The purpose of blinding the outcome assessors (who might also be the care providers) is to protect against detection bias.

(Q2) Study participants should not be aware of (i.e. blinded to) the research question. The purpose of blinding the participants is to protect against reporting bias.

E) DATA COLLECTION METHODS

Tools for primary outcome measures must be described as reliable and valid. If 'face' validity or 'content' validity has been demonstrated, this is acceptable. Some sources from which data may be collected are described below:

Self reported data includes data that is collected from participants in the study (e.g. completing a questionnaire, survey, answering questions during an interview, etc.).

Assessment/Screening includes objective data that is retrieved by the researchers. (e.g. observations by investigators).

Medical Records/Vital Statistics refers to the types of formal records used for the extraction of the data.

Reliability and validity can be reported in the study or in a separate study. For example, some standard assessment tools have known reliability and validity.

F) WITHDRAWALS AND DROP-OUTS

Score **YES** if the authors describe BOTH the numbers and reasons for withdrawals and drop-outs.

Score **NO** if either the numbers or reasons for withdrawals and drop-outs are not reported.

Score **NOT APPLICABLE** if the study was a one-time interview or survey where there was not follow-up data reported.

The percentage of participants completing the study refers to the % of subjects remaining in the study at the final data collection period in all groups (i.e. control and intervention groups).

G) INTERVENTION INTEGRITY

The number of participants receiving the intended intervention should be noted (consider both frequency and intensity). For example, the authors may have reported that at least 80 percent of the participants received the complete intervention. The authors should describe a method of measuring if the intervention was provided to all participants the same way. As well, the authors should indicate if subjects received an unintended intervention that may have influenced the outcomes. For example, co-intervention occurs when the study group receives an additional intervention (other than that intended). In this case, it is possible that the effect of the intervention may be over-estimated. Contamination refers to situations where the control group accidentally receives the study intervention. This could result in an under-estimation of the impact of the intervention.

H) ANALYSIS APPROPRIATE TO QUESTION

Was the quantitative analysis appropriate to the research question being asked?

An intention-to-treat analysis is one in which all the participants in a trial are analyzed according to the intervention to which they were allocated, whether they received it or not. Intention-to-treat analyses are favoured in assessments of effectiveness as they mirror the noncompliance and treatment changes that are likely to occur when the intervention is used in practice, and because of the risk of attrition bias when participants are excluded from the analysis.

Component Ratings of Study:

For each of the six components A – F, use the following descriptions as a roadmap.

A) SELECTION BIAS

Good: The selected individuals are very likely to be representative of the target population (Q1 is 1) **and** there is greater than 80% participation (Q2 is 1).

Fair: The selected individuals are at least somewhat likely to be representative of the target population (Q1 is 1 or 2); **and** there is 60 - 79% participation (Q2 is 2). 'Moderate' may also be assigned if Q1 is 1 or 2 and Q2 is 5 (can't tell).

Poor: The selected individuals are not likely to be representative of the target population (Q1 is 3); **or** there is less than 60% participation (Q2 is 3) **or** selection is not described (Q1 is 4); and the level of participation is not described (Q2 is 5).

B) DESIGN

Good: will be assigned to those articles that described RCTs and CCTs.

Fair: will be assigned to those that described a cohort analytic study, a case control study, a cohort design, or an interrupted time series.

Weak: will be assigned to those that used any other method or did not state the method used.

C) CONFOUNDERS

Good: will be assigned to those articles that controlled for at least 80% of relevant confounders (Q1 is 2); **or** (Q2 is 1).

Fair: will be given to those studies that controlled for 60 – 79% of relevant confounders (Q1 is 1) **and** (Q2 is 2).

Poor: will be assigned when less than 60% of relevant confounders were controlled (Q1 is 1) **and** (Q2 is 3) **or** control of confounders was not described (Q1 is 3) **and** (Q2 is 4).

D) BLINDING

Good: The outcome assessor is not aware of the intervention status of participants (Q1 is 2); **and** the study participants are not aware of the research question (Q2 is 2).

Fair: The outcome assessor is not aware of the intervention status of participants (Q1 is 2); **or** the study participants are not aware of the research question (Q2 is 2).

Poor: The outcome assessor is aware of the intervention status of participants (Q1 is 1); **and** the study participants are aware of the research question (Q2 is 1); **or** blinding is not described (Q1 is 3 and Q2 is 3).

E) DATA COLLECTION METHODS

Good: The data collection tools have been shown to be valid (Q1 is 1); **and** the data collection tools have been shown to be reliable (Q2 is 1).

Fair: The data collection tools have been shown to be valid (Q1 is 1); **and** the data collection tools have not been shown to be reliable (Q2 is 2) **or** reliability is not described (Q2 is 3).

Poor: The data collection tools have not been shown to be valid (Q1 is 2) **or** both reliability and validity are not described (Q1 is 3 and Q2 is 3).

F) WITHDRAWALS AND DROP-OUTS - a rating of:

Good: will be assigned when the follow-up rate is 80% or greater (Q1 is 1 and Q2 is 1).

Fair: will be assigned when the follow-up rate is 60 – 79% (Q2 is 2) **OR** Q1 is 4 or Q2 is 5.

Poor: will be assigned when a follow-up rate is less than 60% (Q2 is 3) or if the withdrawals and drop-outs were not described (Q1 is No or Q2 is 4).

Not Applicable: if Q1 is 4 or Q2 is 5.

Appendix 3: *Complete EPHPP Quality Assessment of included studies*

First Author, Year	A – Selection Bias	B – Study Design	C – Confounders	D – Blinding	E – Data Collection Methods	F – Withdrawals and Drop-outs	Global Quality Rating	Initial discrepancy between reviewers - with reasons[a]
Chambless, 1995	Weak – 3	Moderate – 2	Strong – 1	N/A	Strong – 1	Moderate – 2	*Moderate*	Yes: Differences in interpretation of criteria
Chavira, 2014	Strong – 1	Strong – 1	Strong – 1	Moderate – 2	Strong – 1	Weak - 3	*Moderate*	Yes: Differences in interpretation of criteria
Clark, 2009	Moderate – 2	Moderate – 2	Weak – 3	N/A	Strong – 1	Weak – 3	*Weak*	Yes: Differences in interpretation of criteria
Friedman, 1994	Moderate – 2	Moderate – 2	Strong – 1	N/A	Weak – 3	N/A	*Moderate*	Yes: Differences in interpretation of criteria
Friedman, 2003	Moderate – 2	Moderate – 2	Strong – 1	N/A	Strong – 1	Moderate - 2	*Strong*	No discrepancy
Friedman, 2006	Moderate – 2	Moderate – 2	Strong – 1	N/A	Weak – 3	N/A	*Moderate*	Yes: Differences in interpretation of criteria
Hobfoll, 2015	Moderate – 2	Strong – 1	Strong – 1	Strong – 1	Strong – 1	Moderate – 2	*Strong*	Yes: Oversight
Horrell, 2014	Strong – 1	Strong – 1	Strong – 1	Weak – 3	Strong – 1	Moderate – 2	*Moderate*	No discrepancy

Jeffreys, 2014	Moderate – 2	Weak – 3	Strong – 1	N/A	Weak – 3	Weak – 3	*Weak*	Yes: Differences in interpretation of criteria
Jonassaint, 2017	Moderate – 2	Strong – 1	Strong – 1	Moderate – 2	Strong – 1	Weak – 3	*Moderate*	No discrepancy
Lester, 2010	Moderate – 2	Moderate – 2	Strong – 1	Moderate – 2	Strong – 1	Moderate – 2	*Strong*	No discrepancy
Markell, 2014	Weak – 3	Strong – 1	Strong – 1	Strong – 1	Strong – 1	Strong - 1	*Moderate*	No discrepancy
Smits, 2013	Moderate – 2	Strong – 1	Strong – 1	Strong – 1	Strong – 1	Moderate - 2	*Strong*	Yes: Differences in interpretation of criteria
Stecker, 2016	Moderate – 2	Strong – 1	Weak – 3	Weak – 3	Strong – 1	Weak – 3	*Weak*	No discrepancy
Tang, 2016	Moderate – 2	Moderate – 2	Strong – 1	N/A	Strong – 1	Weak - 3	*Moderate*	No discrepancy
Zoellner, 1999	Moderate – 2	Strong – 1	Strong – 1	Moderate – 2	Strong – 1	Strong – 1	*Strong*	No discrepancy

[a] All initial discrepancies were resolved after discussion.

Inequalities in mental health services: An intersectional approach to examining ethnicity, gender and socio-economic status in relation to psychological therapy treatment outcomes

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Supervised by

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Table of Contents

List of Figures and Tables

1. Abstract

Background: Mental health inequalities remain a major public health issue in the United Kingdom (UK). Inequalities such as poorer treatment outcomes are consistently associated with individual characteristics such as ethnicity, gender and socio-economic status. These disparities are complex and interrelated, yet few studies have employed a detailed approach to understand how these characteristics are jointly associated with mental health treatment outcomes. This study aimed to employ an intersectional approach to examine mental health inequalities in UK psychological therapy services.

Method: Data from 46,684 patients who completed treatment in Improving Access to Psychological Therapies (IAPT) services in four South London boroughs were analysed. Regression models were used to identify inequalities in treatments indicators and outcomes, predicted by individual characteristics (ethnicity, gender, employment status) and at their intersection. Treatment indicators included treatment allocation (high versus low intensity) and number of treatment sessions attended (up to 12 sessions indicating lower level treatment provision versus more than 12 sessions indicating higher level treatment provision). Treatment outcome referred to recovery and symptom reduction following treatment.

Results: White Other patients had decreased odds of being allocated to a high intensity intervention compared to White British patients. With the exception of the Asian ethnic group, all other ethnic groups had increased odds of being allocated to a high intensity intervention compared to the White British ethnic group, after adjusting for confounders. Asian and Black (African, Caribbean, Other) ethnic groups were less likely to attend more than 12 treatment sessions compared to the White British ethnic group

after adjusting for confounders. Reliable recovery was more likely for female and White British patients. Ethnic minority women showed greater reduction in depression scores compared to White British women, with no significant interaction effect with employment status. Ethnic minority men only showed a greater reduction in depression scores when employment status was considered.

Conclusions: Using an intersectional approach revealed disparities in depression change scores based on intersections between ethnicity, gender and employment status. Future studies should utilise intersectional approaches to ascertain inequalities in mental health treatment outcomes not previously identified.

2. Introduction

2.1. Mental Health Inequalities

Mental health inequalities remain a major public health issue in the United Kingdom (UK) [1]. Despite the implementation of government policies, action plans and interventions (e.g. No Health Without Mental Health; Five Year Forward View for Mental Health) to tackle this important issue, inequalities in mental health among specific social groups persist [1-4]. Increased prevalence of common mental health problems, reduced access to mental health services and poorer clinical outcomes are consistently associated with individual characteristics, such as ethnicity and gender [5-11]. Markers of social disadvantage such as unemployment, poor education and low income are also known to contribute to mental health inequalities [6, 12, 13]. There is increasing recognition that the underlying mechanisms of these disparities are complex and interrelated [14]. Yet few studies have sought to employ a detailed approach to dissect this complex issue in order to better understand how the simultaneous experience of individual characteristics such as ethnicity, gender and socio-economic status are jointly associated with mental health treatment outcomes [15, 16].

National population-based studies in England have consistently reported an increased prevalence of common mental health problems among specific ethnic minority groups. For example, the 2004 Ethnic Minority Psychiatric Illness Rates in the Community (EMPIRIC) study reported an increased prevalence among Irish and Pakistani men as well as Indian and Pakistani women compared to their White British counterparts, after adjusting for socio-economic status [17]. The Adult Psychiatric Morbidity Survey (APMS) has been monitoring prevalence of mental health problems in England's general

population since 1993 [7]. Since APMS 2000, there has been a slight increase in the prevalence of common mental health problems among women, with an overall stability among men. The most recent data from APMS 2014 identified an increased prevalence of common mental health problems among women from Black ethnic groups, adults who were not in employment and those receiving benefits [7]. The Race Disparity Audit commissioned by the UK government in 2016, also revealed that in the general adult population, anxiety disorders and depression were most prevalent among women from Black ethnic groups [18].

These inequalities in prevalence of common mental health problems are further compounded by inequities in access to mental health care [10]. Individual characteristics such as ethnicity, gender and socio-economic status are known to be associated with inequitable access [19, 20]. There tends to be an overrepresentation of women and individuals from the majority White British ethnic group in psychological therapy services in the UK [10, 18]. It is also important to note that men underutilise mental health services, seek help later and have higher completed suicide rates [16, 21-23].

Most of the aforementioned studies highlight mental health inequalities at the intersection of ethnicity and gender. However, these individual characteristics intersect with a number of unfavourable social and economic circumstances to create patterns of disadvantage among particular social groups. For example, men, ethnic minorities and individuals with lower socio-economic status experience greater traumatic and stressful life events [24]. There is an increased risk of common mental health problems associated with experiences of discrimination and interpersonal racism among ethnic minority

groups in the UK [25-27]. The stigma associated with mental health problems not only acts as a stressor but also as a barrier to help seeking [28, 29]. Ethnic minorities and men are among specific social groups that are disproportionately deterred by stigma [30]. It is clear that there are a number of factors underlying mental health inequalities. It has also been suggested that ethnicity, gender and socio-economic status may have a multiplicative effect on mental health treatment outcomes [31]. Therefore, there is a need for an approach that is able to account for the complex interrelationships that exist between these individual characteristics.

2.2. Mental Health Treatment Outcomes

It is becoming increasingly important to identify both individual and treatment characteristics that are associated with better clinical outcomes among individuals accessing psychological therapy services in the UK [32]. However, the research examining the effects of individual characteristics such as ethnicity and gender on clinical outcomes following treatment for common mental health problems is scarce in the UK [32, 33]. Most of the available evidence comes from the Improving Access to Psychological Therapies (IAPT) programme [34-37]. Routinely collected data in IAPT services are submitted to NHS Digital on a monthly basis for analysis, and a minimum of 50% of referrals are expected to reach recovery[1] [36, 38].

Results from two IAPT demonstration sites found no significant ethnic differences in recovery rates [34]. However, recovery following psychological therapies has been

[1] Recovery: From above clinical cut-off on measures of depression or anxiety before treatment to below clinical cut-off following treatment [36]

found to be most likely among men and women from White ethnic groups and least likely for individuals from Bangladeshi, Pakistani, Other Asian or Other ethnic groups [18]. The most recent annual IAPT report (2017/2018) also revealed that individuals from White ethnic groups were more likely to reliably improve[2] following treatment compared to all other ethnic groups. Individuals from Asian and Other (including Chinese) ethnic groups were the least likely to show reliable improvement [6, 39, 40]. Results of ethnicity stratified by gender indicated that men and women from White ethnic backgrounds showed the highest rate of reliable improvement, with men and women from Asian and Other ethnic backgrounds showing the lowest improvement. Women were more likely to show reliable improvement than men in most ethnic groups, with the exception of the Chinese, Bangladeshi and Black Caribbean ethnic groups [6, 39, 40].

Although the provision of psychological treatment by IAPT services in the UK has increased due to the governments' continued drive towards equity in accessing mental health services [1], inequalities in clinical outcomes remain among specific groups. Consequently, efforts have been made to identify individual and treatment characteristics associated with recovery following treatment in IAPT services. Gyani and colleagues (2013) analysed data collected across 32 IAPT services during the first operating year and identified higher intensity intervention[3], a greater number of treatment sessions and initial symptom severity as significant predictors of recovery [41, 43, 44]. These differences could not be accounted for by dropout or cancellation rates

[2] Reliable Improvement: Depression and/or anxiety scores reduced by a reliable amount with no reliable increase in either measure [36]

[3] High Intensity Intervention: Typically offered to patients who have failed to respond to low intensity interventions such as guided self-help [41, 42]

in a previous study [44]. However, progress with employment issues during treatment in IAPT services has been associated with psychological recovery [45].

More recent analysis of data across two London IAPT services echoed the findings of Gyani and colleagues (2013) [41], but noted the absence of research identifying patient level characteristics such as ethnicity and gender as potential predictors of clinical outcomes [32]. In Green and colleagues' (2015) study, initial anxiety and depression symptom severity, ethnicity, low socio-economic status and gender were identified as pre-treatment predictors of recovery [32]. However, the authors called for larger scale research applying detailed analysis to the understanding of mental health inequalities among groups such as ethnic minorities whilst accounting for factors such as socio-economic status [32]. Such research would provide opportunities to identify specific groups that are likely to receive treatment characteristics that are associated with better clinical outcomes. More importantly, this may lead to the identification of specific interventions needed to reduce inequalities in clinical outcomes within UK psychological therapy services. Thus, a theoretical framework is needed that accounts for the intersection of individual characteristics in examining clinical outcomes.

2.3. Using an Intersectional Approach

Intersectionality theory asserts that focussing on individual characteristics is insufficient in understanding patterns of inequalities [46-48]. This approach provides opportunities to identify how multiple social identities intersect to produce patterns of disadvantage or privilege; a key component in the understanding of mental health inequalities [48,

49]. Moreover, an intersectional approach introduces more nuances and context to the study of social identities, particularly in diverse populations [48, 50].

Studies applying an intersectional approach to the understanding of mental health inequalities are emerging. In the United States (US), Assari and colleagues (2018) identified income as a protective factor against the risk of developing major depression, with stronger effects amongst females than males [51]. The authors also identified higher income as a strong protective factor for individuals from a Black Caribbean ethnic background [51]. However, an earlier study in the US found high income to be a risk factor for developing major depression among African American men [31]. Patterns in the UK context are much less clear. Two recent studies conducted in South London have contributed to the literature by responding to calls for more research using an intersectional approach [50, 52]. These studies highlighted previously unidentified mental health inequalities among the economically inactive White British ethnic group and low income migrant groups [50, 52]. The identification of such patterns of inequalities based on the intersection of individual characteristics is fundamental to improving mental health treatment outcomes.

2.4. The Current Study

It is important to investigate the effects of individual characteristics such as ethnicity, gender and socio-economic status and their joint association with treatment outcomes in UK psychological therapy services in order to enhance the current understanding of mental health inequalities. With nearly half of the total population of ethnic minorities living in London [53], it is of further importance to understand whether mental health

inequalities exist in areas as socially and ethnically diverse as South London. Findings from such research may have important implications for treatment offered in local services, targeted interventions and public health policy.

2.4.1. Aims and Objectives

The current study utilises data collected in Improving Access to Psychological Therapies (IAPT) services in the four South London boroughs (Lambeth, Lewisham, Southwark and Croydon) served by the South London and Maudsley (SLAM) NHS Foundation Trust. The primary aim of this study is to examine mental health inequalities in these IAPT services by employing an intersectional approach to investigate associations between individual characteristics (ethnicity, gender, socio-economic status), treatment indicators as well as treatment outcome. Treatment indicators are defined as factors such as treatment allocation, number of treatment sessions and treatment engagement. Treatment outcome refers to recovery and reduction in anxiety and depression symptoms following receipt of psychological therapy. The study will address the following aims:

(i) To describe the socio-demographic and socio-economic differences between ethnic groups.

(ii) To investigate the associations between ethnicity, gender, specified treatment indicators and treatment outcome.

(iii) To investigate whether the effect of socioeconomic status on treatment outcomes differ by ethnicity, gender and when ethnicity is stratified by gender.

2.4.2. Hypotheses

- Ethnic minority status will be associated with poorer treatment outcomes.
- Female gender will be associated with better treatment outcomes.
- Higher socio-economic status will be associated with better treatment outcomes.
- Ethnic minority men and women with lower socio-economic status (SES) will have poorer treatment outcomes when compared to their White British, high SES counterparts.

3. Method

3.1. Design

This study analysed clinical outcome data routinely collected in IAPT services across the four South London boroughs covered by South London and Maudsley (SLAM) NHS Foundation Trust (Southwark, Lambeth, Lewisham and Croydon). First episode pre- and post-treatment data were analysed to examine associations between individual characteristics (ethnicity, gender, socio-economic status), specified treatment indicators and treatment outcomes.

3.2. Sample

The sample included adults who attended IAPT services in the four South London boroughs served by SLAM. Patients were included in this study if they were considered to have completed a course of treatment. This was defined as patients who attended at least two treatment sessions, with available depression and anxiety scores for at least two sessions and who had been discharged from the service [43, 54]. Patients were also included if they had available data for key socio-demographic and outcome variables. Only data from the first episode of treatment were included. All patients in this study completed their first treatment episode between 20th November 2008 and 30th December 2016.

3.3. Treatment provided in IAPT services

In IAPT services, initial treatment allocation is typically determined following a brief triage assessment (primarily by telephone) of the presenting problem. Services typically follow a stepped care approach and patients are usually allocated to receive 'low intensity' treatment in the first instance. Low intensity interventions are delivered by

psychological wellbeing practitioners and include treatments such as psycho-education groups, workshops, guided self-help or online support packages [45]. Progress is reviewed throughout the course of treatment and a decision may be made by a patient and their therapist to step up to a 'high intensity' treatment. High intensity interventions are delivered by psychological therapists specialising in evidence-based treatments such as Cognitive Behavioural Therapy (CBT) and/or Interpersonal Psychotherapy (IPT) [45].

The National Institute for Clinical Excellence (NICE) Guidelines provides recommendations for the number of sessions that should be offered in order to optimise treatment outcome. Low intensity interventions for anxiety disorders or depression typically consist of up to eight sessions, usually over a period of 9 to 12 weeks and high intensity treatments typically range between 12 to 15 weekly sessions for anxiety disorders and between 16 to 20 sessions for depression, usually over a period of 3 to 4 months [42, 43]. The IAPT Manual also states that patients are to be offered up to the NICE-recommended number of treatment sessions according to the presenting clinical condition [29]. Patients may be offered additional sessions after review or offered follow up sessions.

3.4. Measures

3.4.1. Socio-demographic characteristics

Key socio-demographic information of patients referred to IAPT services were typically recorded by a clinician during a triage or assessment session. The socio-demographic characteristics used in the analyses included age (at entry to the service), gender and ethnicity. Ethnicity was self-reported and recorded using one of 18 UK census categories [55]. These subgroups were collapsed into one of the following eight categories: White

British, White Other (Irish, Gypsy/Irish Traveller, Any other White background), Mixed (White and Black Caribbean, White and Black African, White and Asian, Any other mixed background), Asian (Indian, Pakistani, Bangladeshi, Chinese, Any other Asian background), Black African, Black Caribbean, Black Other or Other (Arab, Any Other ethnic group).

3.4.2. Socio-economic characteristics

Socio-economic characteristics were collected and recorded at the assessment stage and at each clinical contact as part of IAPT's minimum dataset. Patients typically self-complete questionnaires prior to assessment or treatment sessions. Employment status at the beginning of treatment was used as the indicator of socio-economic status (SES). This variable was categorised into whether patients were in paid employment (employed, self-employed) or not in paid employment (unemployed, student, homemaker/carer, retired, disabled, voluntary/work experience). Receipt of benefits or statutory sick pay (SSP) were also recorded at the beginning of treatment [34]. These variables were examined and reported descriptively.

3.4.3. Clinical Outcome

The following standardised and validated self-report measures were completed at each clinical contact.

The *Patient Health Questionnaire (PHQ-9)* is a 9-item questionnaire that measures symptoms of depression [56]. Each item is rated on a scale from 0 to 3 and ratings are summed to produce a total score with a possible range from 0 to 27. The clinical cut-off

on the PHQ-9 is a score of 10 or above, which indicates 'caseness'. The PHQ-9 has been shown to have excellent internal consistency (α = 0.89) and has been found to have good sensitivity and specificity as a diagnostic measure of depressive disorders [56].

The *Generalised Anxiety Disorder (GAD-7)* questionnaire is a 7-item questionnaire measuring severity of anxiety symptoms [57]. Items are rated on a scale from 0 to 3 and ratings are summed to produce a total score with a possible range from 0 to 21. A score of 8 or above on the GAD-7 indicates 'caseness'. The measure has demonstrated excellent internal consistency (α = 0.92) [57]. It is a recommended measure that assesses and monitors the severity of multiple anxiety disorders in primary care settings [58].

3.5. Definition of Treatment Indicators

3.5.1. Treatment Allocation

Treatment allocation was defined as the type of intervention assigned upon entry to the service. The first recorded intervention type (high versus low intensity treatment) was used to assess differences in treatment allocation between groups.

3.5.2. Treatment Sessions Attended

The total number of treatment sessions attended by patients was computed. Inspection of the data distribution revealed issues with outliers, where some services offered more than 20 treatment sessions. In order to meaningfully assess levels of treatment provision, this variable was dichotomised according to whether patients attended up to 12 treatment sessions (to indicate a lower level of treatment provision) or more than 12

treatment sessions (to indicate a higher level of treatment provision). This categorisation is also in line with NICE recommended number of treatment sessions for low and high intensity interventions within IAPT services [36].

3.5.3. Treatment Engagement

Treatment engagement was defined as whether patients engaged/completed or discontinued treatment (i.e. failed to engage, dropped out or never attended). There were differences in how discharges were recorded in each of the four boroughs at the clinician level. These data could not accurately be used to ascertain whether patients were discharged following engagement or disengagement. Consequently, associations between ethnicity, gender, socio-economic status and treatment engagement could not be explored.

3.6. Definition of Treatment Outcome

3.6.1. Reliable Recovery

The main treatment outcome variable used in this study was reliable recovery. Reliable recovery was calculated for patients who completed a course of treatment using methods described by NHS Digital [54]. Reliable recovery takes into account whether a patient meets both the criteria for recovery on the PHQ-9 and GAD-7 and the criteria for reliable improvement [54].

In IAPT services recovery is calculated based on 'caseness'. A patient was considered to have 'recovered' if either their PHQ-9 or GAD-7 scores met the 'caseness' threshold at the beginning of treatment and both scores were below the 'caseness' threshold (i.e. <

10 or < 8 respectively) at their final session [43, 54, 59]. The criteria for reliable improvement was met if there was a decrease in first to last PHQ-9 or GAD-7 scores that exceeded the measurement error for each questionnaire and there was no reliable deterioration in scores. Any increase between first to last PHQ-9 or GAD-7 scores should not exceed the measurement error [54].

The measurement error for the PHQ-9 and GAD-7 questionnaires was determined by calculating the reliable change index [60]. Reliability coefficients for the PHQ-9 and GAD-7 measures were taken from the validation studies previously mentioned [56, 57] and used as part of these calculations [41]. Based on calculations using the means and standard deviations from the current sample, the criteria for reliable improvement would be met if the decrease in PHQ-9 scores exceeded 2.08 or the reduction in GAD-7 scores exceeded 2.65 and any increase in PHQ-9 or GAD-7 scores did not exceed these values.

3.6.2. Change in symptom scores

As a second measure of treatment outcome, changes in self-reported depression and anxiety symptoms were also calculated using PHQ-9 and GAD-7 scores. Change scores were calculated by subtracting first session scores from the final session scores.

3.7. Description of confounding variables

Working age adults are more likely to access psychological therapies [10, 61, 62] and there is known variation in employment deprivation by borough [63]. Thus, potential differences by age and borough were controlled for in all models. The type of intervention received (i.e. high versus low intensity) influences the number of treatment

sessions attended. Therefore, the highest level of treatment intensity received was computed and entered as a potential confounder when assessing differences in the number of treatment sessions attended.

The last recorded intervention type was used to determine the highest level of treatment intensity received by the time treatment was completed. This takes into account whether a patient was stepped up to a high intensity intervention after starting a low intensity intervention.

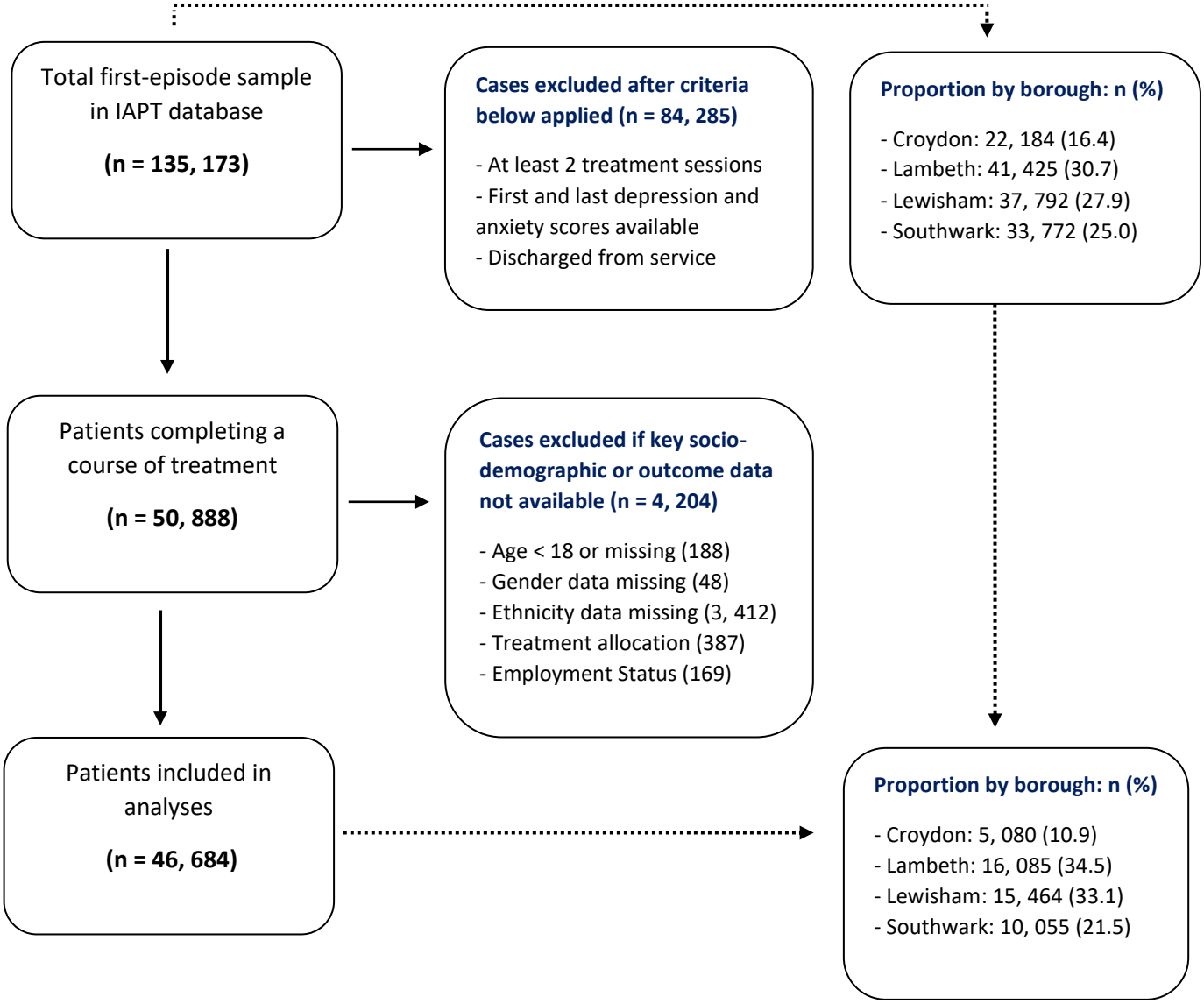
Age, borough, highest level of treatment intensity received and number of treatment sessions attended were adjusted for as potential confounders in treatment outcome models (reliable recovery and change in symptom scores).

3.8. Procedure

Socio-demographic and clinical data routinely recorded on IAPT Psychological Therapy Patient Management Systems (IAPTus) were extracted and exported using the Clinical Record Interactive Search (CRIS) system. The CRIS system at the National Institute of Health Research (NIHR) Maudsley Biomedical Research Centre (BRC) provides secure access to pseudo- anonymised records extracted from SLAM electronic patient records for research purposes [64]. This study received ethical approval from the Oxfordshire Research Ethics Committee (ref 08/H0606/71). Approval was also granted by the CRIS Oversight Committee (ref 17-005) and the Health Research Authority (ref 18/HRA/0368) (see Appendix 1).

Data recorded between 1st January 2008 and 31st December 2016 on IAPTus across the four SLAM boroughs was extracted. Only data from sessions occurring in the first treatment episode were investigated. A total of 135, 173 records were extracted. The analytic sample for this study was defined and the data were prepared for analyses as shown in Figure 1 and described in more detail below.

Figure 1: Flow chart showing process of defining analytic sample



3.8.1. Definition of Analytic Sample

Patients who did not complete a course of treatment were excluded from the analyses (n = 84,285). Patients recorded as being under the age of 18 years (n = 181) were also excluded. In order to accurately describe differences across multiple models (i.e. unadjusted, partially adjusted, fully adjusted models), patients with no available socio-

demographic or outcome data were not included in the analyses. As such, patients were excluded if there was no available data for age (n = 7), gender (n = 48), ethnicity (n = 3, 412), treatment allocation (n = 387) or employment status (n = 169).

3.8.2. Differences between excluded patients and the analytic sample

The socio-demographic and treatment characteristics of patients excluded from the analyses were compared to patients in the analytic sample using Wilcoxen Mann Whitney tests, chi-square tests and independent samples t-tests.

The highest proportion of patients excluded from the analyses were treated in the borough of Southwark. There was a significant difference in the underlying distribution of age between patients with and without key socio-demographic or outcome data ($z = 12.82$; $p < 0.001$). Excluded patients were slightly older (Mean = 40.51; S.D. = 13.61) than patients in the analytic sample (Mean = 37.69; S.D. = 12.76). Excluded patients and those in the analytic sample did not differ significantly in proportions by gender, employment status or number of treatment sessions attended.

A higher proportion of excluded patients were allocated to receive a high intensity intervention at the beginning of treatment (57.57% high versus 42.43% low) compared to proportions in the analytic sample (47.06% high versus 52.94% low); where a higher proportion was allocated to receive a low intensity intervention. Patients excluded from the analyses had a significantly smaller reduction in depression (Means = -5.02 vs. -6.33; $p < 0.001$) and anxiety symptoms (Means = -4.34 vs. -5.67; $p < 0.001$) compared to patients in the analytic sample. A significantly higher proportion of excluded patients did not meet the criteria for reliable recovery (56.57% versus 43.43%).

3.9. Data Analyses

Data were analysed using STATA version 15. The characteristics of the analytic sample were reported using means, standard deviations and frequencies. Differences in characteristics between the ethnic groups were analysed using one-way analysis of variance tests and chi-square tests. Significant group effects were examined using post hoc tests of comparisons with Bonferroni adjustments.

Associations between ethnicity, gender, employment status (as an indicator of SES) and dichotomised treatment indicators were examined using binomial logistic regression models. Associations between ethnicity, gender, employment status and treatment outcome were also examined using binomial logistic regression models. Odds ratios were calculated with 95% confidence intervals. Prevalence estimates were also calculated and reported. First, unadjusted models were run with ethnicity and gender entered separately. Second, models were partially adjusted for variables such as age, borough, highest treatment intensity received and number of sessions attended. Third, models were fully adjusted by controlling for employment status.

The effect of employment status on changes in depression and anxiety scores (first to last session) was investigated using multiple regression analyses. Ethnicity was stratified by gender in order to create groups for comparison. White British men were compared to men from Black, Asian and Other minority ethnic (BAME) groups. Analyses for White British women and BAME women were conducted separately.

In multiple regression models, separate partially adjusted models were first run with ethnicity, gender and ethnicity stratified by gender as separate predictor variables. These models were adjusted for age, borough, highest treatment intensity received and number of sessions attended. Second, employment status was entered into the models and third, the interaction term (predictor variable x employment status) was entered in the fully adjusted model. Likelihood ratio tests were run to assess differences between the models.

4. Results

4.1. Socio-demographic and socio-economic characteristics

A total of 46, 684 patients completed treatment and were included in the analyses. The socio-demographic, socio-economic and treatment characteristics of the sample are summarised in Table 1.

The mean age of the sample was 37.69 years (S.D. = 12.76). A majority of patients were female (65.44%) and were from a White British background (56.91%). Overall, a majority of patients were recorded as being in paid employment (61.46%), not in receipt of benefits (79.20%) and not in receipt of statutory sick pay (SSP) (92.01%) at the beginning of treatment. Approximately half of the total sample (52.94%) was allocated to receive a low intensity intervention at the beginning of treatment and most patients attended up to 12 treatment sessions (83.25%) rather than 12 or more. Just over half (55.10%) of the patients met the criteria for recovery, 53.73% reliably recovered and 77.03% demonstrated reliable improvement in their pre to post treatment scores.

Table 1 Socio-demographic, socio-economic and treatment characteristics of the analytic sample (N = 46, 684)

	Socio-demographic and socio-economic characteristics				
		N	**%**	**Range**	**Mean (S.D.)**
Age				18 - 97	37.69 (12.76)
Gender	Male	16,135	34.56		
	Female	30,549	65.44		
Ethnicity	White British	26,570	56.91		
	White Other	5,966	12.78		
	Mixed	2,469	5.29		
	Asian	2,940	6.30		
	Black African	1,978	4.24		
	Black Caribbean	4,810	10.30		
	Black Other	980	2.10		
	Other	971	2.08		
Employment Status	Employed	28,694	61.46		
	Unemployed	9,366	20.06		
	Student	2,812	6.02		
	Homemaker/Carer	2,131	4.56		
	Retired	1,921	4.11		
	Disabled	1,590	3.41		
	Vol/ Work Experience	170	0.36		
Employment Status	Paid Employment	28,694	61.46		
(Dichotomised)	Not in Paid Employment	17,990	38.54		
Benefits Status	Not in receipt of benefits	36,976	79.20		
	Receiving benefits	9,177	19.66		
	Missing	531	1.14		
SSP Status	Not in receipt of SSP	42,956	92.01		
	Receiving SSP	3,635	7.79		
	Missing	93	0.20		
	Treatment Characteristics				
		N	**%**	**Range**	**Mean (S.D.)**
Treatment Allocation	Low Intensity	24,713	52.94		
	High Intensity	21,971	47.06		
Treatment Sessions Attended	Up to 12 sessions	38,865	83.25		
	> 12 sessions	7,819	16.75		
Recovery	Recovered	25,721	55.10		
	Not Recovered	20,963	44.90		
Reliable Improvement	Reliably Improved	35,959	77.03		
	Not Reliably Improved	10,725	22.97		
Reliable Recovery	Reliably Recovered	25,082	53.73		
	Not Reliably Recovered	21,602	46.27		
Baseline PHQ-9				0 - 27	14.81 (6.43)
Last PHQ-9				0 - 27	8.48 (6.69)
Baseline GAD-7				0 - 21	13.28 (5.25)
Last GAD-7				0 - 21	7.61 (5.78)

Note: Other ethnic group = Patients categorised as Arab or Any Other ethnic group using UK Census categories

Abbreviations: Vol: Voluntary; SSP: Statutory Sick Pay; PHQ-9: Patient Health Questionnaire; GAD-7: Generalised Anxiety Disorder

4.1.1. Characteristics by borough

A breakdown of the socio-demographic and treatment characteristics of the sample by SLAM borough is presented in Supplemental Table 1 (see Appendix 2). Mean ages across the four boroughs ranged from 36.04 years (Lambeth) to 40.62 years (Croydon). In each borough there were more females (range = 62.59% to 67.54%) than males and individuals from the White British ethnic group (range = 53.49% to 59.61%) than individuals from an ethnic minority group. Most patients were in paid employment at the beginning of treatment, with proportions ranging from 58.15% in Croydon to 65.04% in Lambeth. Majority of patients across the boroughs were recorded as not in receipt of benefits (range = 77.03% to 81.19%) or in receipt of SSP (range = 89.74% to 94.55%) at the beginning of treatment.

Patients allocated to receive a high intensity intervention at the beginning of treatment ranged from 33.32% in Lambeth to 60.48% in Southwark. Proportions of patients who attended more than 12 treatment sessions ranged from 11.51% (Lewisham) to 24.96% (Southwark). Patients meeting the reliable recovery threshold ranged from 47.06% (Southwark) to 58.23% (Lambeth).

4.2. Socio-demographic and socio-economic characteristics by ethnic group

To address Aim 1, one-way analysis of variance tests and chi square tests were conducted with Bonferroni-adjusted post hoc comparisons. Table 2 presents the socio-demographic characteristics and baseline anxiety and depression scores of the sample by ethnic group. Comparisons between ethnic minority groups and the majority White British ethnic group are also presented.

Across all ethnic groups, Black Caribbean patients were amongst the oldest (Mean = 38.83 years) and patients in the Mixed ethnic group were the youngest (Mean = 32.92 years). Post hoc comparisons revealed that Black Caribbean patients were significantly older than patients in all except the Black Other (Mean = 38.1 years) and Other (Mean = 38.17 years) ethnic groups. Patients in the Mixed ethnic group were significantly younger than patients in all other ethnic groups.

Chi square tests indicated a significant gender difference across the ethnic groups. Post hoc analyses comparing pairs of groups revealed a significantly higher proportion of females in the Black (African, Caribbean, Other) ethnic groups (68.86%, 74.26%, 73.88% respectively) compared to proportions in the White British (62%) and Asian (63.23%) ethnic groups. There was also a significantly higher proportion of Black Caribbean females than Black African females.

There was an overall ethnic group difference in the proportion of patients in paid employment. A higher proportion of White British and White Other patients were in paid employment compared to patients in all other ethnic groups (see Table 2). There

was also a higher proportion of patients from the Mixed ethnic group in paid employment compared to patients from Black (African, Caribbean, Other) ethnic groups.

There was a significant ethnic group difference in the proportion of patients in receipt of benefits. A higher proportion of patients in the Mixed, Black (African, Caribbean, Other) and Other ethnic groups were receiving benefits when compared to patients in the White British and White Other ethnic groups. There was also a higher proportion of Black Caribbean patients in receipt of SSP compared to White British patients.

All ethnic minority groups had significantly higher baseline depression and anxiety symptom scores compared to the White British ethnic group (see Table 2). Post hoc analyses comparing pairs of groups also revealed that the White Other ethnic group had significantly lower baseline depression scores compared to all other ethnic minority groups. Patients in the Black African ethnic group had significantly higher baseline depression scores compared to most other ethnic minority groups (except Black Other and Other ethnic groups).

Table 2 Socio-demographic characteristics and baseline depression and anxiety scores by ethnic group (N = 46, 684)

	Socio-demographic and socio-economic characteristics									
		White British	**White Other**	**Mixed**	**Asian**	**Black African**	**Black Caribbean**	**Black Other**	**Other**	**Statistical Test; *p* value**
		N = 26,570 (%)	N = 5,966 (%)	N = 2,469 (%)	N = 2,940 (%)	N = 1,978 (%)	N = 4,810 (%)	N = 980 (%)	N = 971 (%)	
Age - Mean (S.D.)		38.07 (13.45)	37.17 (11.23)*	32.92 (11.04)*	37.39 (12.61)	37.29 (11.41)	38.83 (12.39)*	38.10 (12.39)	38.17 (11.62)	F(7, 46, 683)= 61.1;p < 0.001
Gender	Female	16,473 (62.00)	4,142 (69.43)*	1,783 (72.22)*	1,859 (63.23)	1,362 (68.86)*	3,572 (74.26)*	724 (73.88)*	634 (65.29)	χ2 (7) = 444.1; p < 0.001
Employment Status	Paid Employment	1,7428 (65.59)	3,883 (65.09)	1,414 (57.27)*	1,572 (53.47)*	952 (48.13)*	2,487 (51.70)*	476 (48.57)*	482 (49.64)*	χ2 (7) = 789.9; p < 0.001
Benefits Status	Receiving Benefits	4,471 (17.01)	978 (16.54)	573 (23.43)*	513 (17.81)	539 (27.63)*	1,518 (31.95)*	317 (32.92)*	268 (27.97)*	χ2 (7) = 855.0; p < 0.001
SSP Status	Receiving SSP	1,803 (6.79)	370 (6.21)	176 (7.13)	271 (9.27)	235 (11.95)	577 (12.02)*	126 (12.91)	77 (8.01)	χ2 (7) = 269.9; p < 0.001
Baseline Scores - Mean (S.D.)										
PHQ-9		14.15 (6.39)	14.89 (6.45)*	15.39 (6.22)*	15.67 (6.57)*	16.72 (6.32)*	16.18 (6.27)*	16.32 (6.01)*	16.32 (6.21)*	F(7, 46,676) = 125.0; p <0.001
GAD-7		12.94 (5.21)	13.54 (5.22)*	13.63 (5.14)*	13.82 (5.36)*	14.08 (5.17)*	13.70 (5.35)*	13.75 (5.18)*	14.14 (5.24)*	F(7, 46,676) = 40.2; p <0.001

Note: Sample size for Benefits Status = 46, 153; Statutory Sick Pay (SSP) = 46,591

Other ethnic group = Patients categorised as Arab or Any Other ethnic group using UK Census categories

*Post hoc tests of comparisons indicated statistically significant differences between ethnic minority groups and the White British group. Comparisons between other ethnic groups not shown.

4.3 Associations between ethnicity, gender, treatment indicators and treatment outcome

4.3.1. Ethnicity, Gender and First Treatment Allocation

Logistic regression analyses were conducted in order to address Aim 2. Associations between ethnicity, gender and first treatment allocation (i.e. high intensity treatment) are presented in Table 3. Unadjusted associations between ethnicity and treatment allocation indicated that all except the White Other ethnic group had increased odds of being allocated to a high intensity intervention compared to the White British ethnic group. However, White Other patients showed a significant decrease in odds (7%) of being allocated to a high intensity intervention compared to the White British ethnic group after adjusting for age and borough in the partially adjusted model (OR = 0.93; 95% CI 0.88, 0.99, p = 0.019) and after accounting for employment status in the fully adjusted model (OR = 0.93; 95% CI 0.88, 0.99, p = 0.014). This change in association appeared to be accounted for when borough was entered in the partially adjusted model (not shown in Table 3).

Patients categorised as Black Other had the highest increased odds (44%) of high intensity treatment allocation in the unadjusted model (OR = 1.44; 95% CI 1.26, 1.63; p = 0.002). This association reduced after adjusting for employment status in the fully adjusted model (OR = 1.42; 95% CI 1.24, 1.62; p < 0.001). Black African patients had a 33% increase in odds of being allocated to a high intensity intervention compared to White British patients in the unadjusted model (OR = 1.33, 95% CI 1.22, 1.46). This association partially attenuated but remained significant in the partially adjusted model (OR = 1.19, 95% CI 1.08, 1.31) and after adjusting for employment status in the fully

adjusted model (OR = 1.11, 95% CI 1.01, 1.22). In the fully adjusted model, all except the Asian ethnic group were significantly more likely to be allocated to a high intensity intervention compared to the White British ethnic group.

Unadjusted associations between gender and treatment allocation indicated that female patients had an 8% increase in odds of being allocated to a high intensity intervention at the beginning of treatment (OR = 1.08; 95% CI 1.04, 1.12). This association reduced in the partially adjusted (OR = 1.05; 95% CI 1.01, 1.09) and fully adjusted models (OR = 1.05; 95% CI 1.01, 1.09) but remained significant. The reduction in the partially adjusted model appeared to be accounted for when borough was entered as a potential confounder (not shown in Table 3).

4.3.2. Ethnicity, Gender and Treatment Sessions Attended

Associations between ethnicity, gender and number of treatment sessions attended are presented in Table 3. In the unadjusted model, the Asian (OR = 0.87; 95% CI 0.78, 0.96), Black African (OR = 0.67; 95% CI 0.58, 0.77) and Black Caribbean (OR = 0.69; 95% CI 0.63, 0.76) ethnic groups were significantly less likely to attend more than 12 treatment sessions when compared to the majority White British ethnic group. These associations increased after controlling for age, borough and highest treatment intensity received in the partially adjusted model. Asian patients went from showing a 13% decrease in odds of attending more than 12 treatment sessions compared to White British patients in the unadjusted model, to showing a 22% decrease in odds in the partially adjusted model (OR = 0.78; 95% CI 0.69, 0.87). This association remained significant after adjusting for employment status in the fully adjusted model (OR = 0.79; 95% CI 0.71, 0.88).

A similar pattern was observed for the Black African and Black Caribbean ethnic groups. In the partially adjusted model, the Black African ethnic group had a 37% decrease in odds of attending more than 12 treatment sessions (OR = 0.63; 95% CI 0.55, 0.73) and the Black Caribbean ethnic group had a 34% decrease in odds (OR = 0.66; 95% CI 0.60, 0.73) compared to their White British counterparts. These associations remained significant after adjusting for employment status (see Table 3).

In the unadjusted model there was no significant difference in likelihood of attending more than 12 treatment sessions for the Black Other ethnic group when compared to the White British ethnic group (OR 0.88; 95% CI 0.74, 1.05; p = 0.146). However, this association was significant after adjusting for age, borough and highest treatment

intensity received in the partially adjusted model (OR 0.70; 95% CI 0.59, 0.84; $p < 0.001$) and after adjusting for employment status in the fully adjusted model (OR 0.72; 95% CI 0.60, 0.87; $p < 0.001$). The Black Other ethnic group had a 28% decrease in odds of attending more than 12 treatment sessions in the fully adjusted model. This change in association appeared to be accounted for when the highest treatment intensity received was entered in the partially adjusted model (not shown in Table 3).

Unadjusted associations between gender and number of treatment sessions attended indicated that female patients had a 6% increase in odds of attending more than 12 treatment sessions compared to male patients (OR = 1.06; 95% CI 1.01, 1.12; $p = 0.026$). This association fully attenuated in the partially adjusted (OR = 1.05; 95% CI 0.99, 1.11; $p = 0.075$) and fully adjusted models (OR = 1.05; 95% CI 0.99, 1.11; $p = 0.082$).

Table 3 Prevalence estimates and odds ratios of the associations between ethnicity, gender and treatment indicators (N = 46, 684)

		Treatment Indicators				
				Model 1	Model 2 [a,b]	Model 3
		n	Prevalence	Unadjusted OR (95% CI), *p* value	Partially Adjusted OR (95% CI), *p* value	Fully Adjusted OR (95% CI), *p* value
Treatment Allocation		High Intensity Treatment				
Ethnicity	White British	12,159	0.55	1.00	1.00	1.00
	White Other	2,721	0.12	0.99 (0.94 - 1.05), 0.850	0.93 (0.88 - 0.99), 0.019	0.93 (0.88 - 0.99), 0.014
	Mixed	1,222	0.06	1.16 (1.07 - 1.26), < 0.001	1.20 (1.11 - 1.31), < 0.001	1.15 (1.06 - 1.25), 0.001
	Asian	1,422	0.06	1.11 (1.03 - 1.19), 0.007	1.13 (1.05 - 1.22), 0.002	1.08 (0.99 - 1.17), 0.053
	Black African	1,047	0.05	1.33 (1.22 - 1.46), < 0.001	1.19 (1.08 - 1.31), < 0.001	1.11 (1.01 - 1.22), 0.028
	Black Caribbean	2,370	0.11	1.15 (1.08 – 1.22), < 0.001	1.18 (1.10 - 1.25), < 0.001	1.12 (1.05 - 1.19), 0.001
	Black Other	537	0.02	1.44 (1.26 – 1.63), 0.002	1.51 (1.33 - 1.73), < 0.001	1.42 (1.24 - 1.62), < 0.001
	Other	493	0.02	1.22 (1.08 – 1.39), 0.004	1.23 (1.07 - 1.39), 0.002	1.15 (1.01 - 1.32), 0.034
Gender	Male	7,387	0.34	1.00	1.00	1.00
	Female	14,584	0.66	1.08 (1.04 - 1.12), < 0.001	1.05 (1.01 - 1.09), 0.011	1.05 (1.01 - 1.09), 0.014
Treatment Sessions Attended		> 12 Treatment Sessions				
Ethnicity	White British	4,681	0.59	1.00	1.00	1.00
	White Other	1,057	0.14	1.01 (0.94 – 1.08), 0.855	1.02 (0.95 – 1.01), 0.558	1.03 (0.95 - 1.11), 0.530
	Mixed	433	0.06	0.99 (0.89 – 1.11), 0.920	0.92 (0.82 – 1.03), 0.150	0.93 (0.83 - 1.05), 0.246
	Asian	460	0.06	0.87 (0.78 – 0.96), 0.008	0.78 (0.69 – 0.87), < 0.001	0.79 (0.71 - 0.88), < 0.001
	Black African	248	0.03	0.67 (0.58 – 0.77), < 0.001	0.63 (0.55 – 0.73), < 0.001	0.65 (0.56 - 0.75), < 0.001
	Black Caribbean	621	0.08	0.69 (0.63 – 0.76), < 0.001	0.66 (0.60 – 0.73), < 0.001	0.68 (0.61 - 0.74), < 0.001
	Black Other	155	0.02	0.88 (0.74 – 1.05), 0.146	0.70 (0.59 – 0.84), < 0.001	0.72 (0.60 - 0.87), 0.001
	Other	164	0.02	0.95 (0.80 – 1.13), 0.559	0.86 (0.72 – 1.03), 0.106	0.88 (0.74 - 1.06), 0.173
Gender	Male	2,617	0.33	1.00	1.00	1.00
	Female	5,202	0.67	1.06 (1.01 - 1.12), 0.026	1.05 (0.99 - 1.11), 0.075	1.05 (0.99 - 1.11), 0.082

Note: Other ethnic group = Patients categorised as Arab or Any Other ethnic group using UK Census categories

Model 1: Unadjusted models with Ethnicity and Gender entered independently. Model 2: [a] Treatment Allocation model partially adjusted for age and borough

Model 2: [b] Treatment Sessions Attended model partially adjusted for age, borough and highest treatment intensity received

Model 3: Fully adjusted for employment status and confounders entered in model 2

4.3.3. Ethnicity, Gender and Treatment Outcome (Reliable Recovery)

Unadjusted associations between ethnicity and reliable recovery, shown in Table 4, indicated that patients in all ethnic groups were significantly less likely to meet the reliable recovery threshold compared to the White British ethnic group. These associations remained significant after adjusting for age, borough, highest treatment intensity received (indicated by the last recorded treatment intensity) and number of sessions attended in the partially adjusted model and after adjusting for employment status in the fully adjusted model (see Table 4).

In the unadjusted model, the Black Other ethnic group had the greatest decrease (36%) in odds of meeting the reliable recovery threshold compared to the White British group (OR = 0.64; 95% CI 0.56, 0.73). This association partially reduced in the partially adjusted model where the odds of reliable recovery in the Black Other ethnic group compared to the White British ethnic group decreased to 32% (OR = 0.68; 95% CI 0.59, 0.77) and further reduced in the fully adjusted model where the odds decreased to 27% (OR = 0.73; 95% CI 0.64, 0.84). A similar pattern between models was observed for the Black Caribbean and Black African ethnic groups (see Table 4).

In the unadjusted model, female patients had relatively small increased odds (9%) of meeting the reliable recovery threshold than male patients (OR = 1.09; 95% CI 1.06, 1.14) and this association remained significant in the partially adjusted (OR = 1.09; 95% CI 1.05, 1.14) and fully adjusted models (OR = 1.09; 95% CI 1.06, 1.14).

Table 4 Prevalence estimates and odds ratios of the associations between ethnicity, gender and treatment outcome (N = 46, 684)

		Treatment Outcome				
				Model 1	Model 2	Model 3
		n	Prevalence	Unadjusted OR (95% CI), *p* value	Partially Adjusted OR (95% CI), *p* value	Fully Adjusted OR (95% CI), *p* value
Reliable Recovery		Reliably Recovered				
Ethnicity	White British	14,951	0.60	1.00	1.00	1.00
	White Other	3,179	0.13	0.89 (0.84 – 0.94), < 0.001	0.89 (0.85 – 0.95), < 0.001	0.90 (0.85 - 0.95), < 0.001
	Mixed	1,305	0.05	0.87 (0.80 – 0.95), 0.001	0.85 (0.78 – 0.93), < 0.001	0.90 (0.83 - 0.98), 0.020
	Asian	1,371	0.05	0.68 (0.63 – 0.73), < 0.001	0.69 (0.64 – 0.74), < 0.001	0.73 (0.68 - 0.79), < 0.001
	Black African	962	0.04	0.73 (0.67 – 0.80), < 0.001	0.79 (0.73 – 0.88), < 0.001	0.87 (0.79 - 0.96), 0.005
	Black Caribbean	2,414	0.09	0.78 (0.74 – 0.83), < 0.001	0.82 (0.77 – 0.87), < 0.001	0.87 (0.82 - 0.93), < 0.001
	Black Other	443	0.02	0.64 (0.56 – 0.73), < 0.001	0.68 (0.59 – 0.77), < 0.001	0.73 (0.64 - 0.84). < 0.001
	Other	457	0.02	0.69 (0.61 – 0.79), < 0.001	0.72 (0.63 – 0.82), < 0.001	0.77 (0.68 - 0.88), < 0.001
Gender	Male	8,419	0.34	1.00	1.00	1.00
	Female	16,663	0.66	1.09 (1.06 – 1.14), < 0.001	1.09 (1.05 – 1.14), < 0.001	1.09 (1.06 - 1.14), < 0.001

Note: Other ethnic group = Patients categorised as Arab or Any Other ethnic group using UK Census categories

Model 1: Unadjusted models with Ethnicity and Gender entered independently

Model 2: Partially adjusted for age, borough, highest treatment intensity received and number of treatment sessions attended

Model 3: Fully adjusted for employment status and confounders entered in model 2

4.4 Effect of socio-economic status on treatment outcome (symptom change scores)

4.4.1. Variables predicting change in depression symptom scores

Multiple regression analyses were conducted to address Aim 3. Variables predicting changes in depression symptoms are presented in Table 5; first for the overall sample and then at the intersection of ethnicity and gender (i.e. White British men, BAME men; White British women, BAME women) in separate models.

(i) Ethnicity as predictor

In Model 1, Black African (β = -0.03; p <0.001) and Black Caribbean (β = -0.03; p <0.001) patients showed greater reductions in depression scores compared to White British patients. There were no significant differences in depression change scores between all other ethnic groups when compared to the White British group. After adjusting for employment status in Model 2, these associations remained significant and being in paid employment was associated with a greater reduction in depression symptoms than those not in paid employment (β = -0.08; p < 0.001). The interaction term in Model 3 indicated that Black African (β = -0.02; p = 0.001) and Black Caribbean patients in paid employment (β = -0.02; p = 0.002) showed significantly greater reductions in depression scores compared to White British patients in paid employment. Likelihood ratio tests showed that the differences between all models were statistically significant. The inclusion of the interaction term in Model 3 was a better fit for the data than the inclusion of employment status in Model 2.

(ii) Gender as predictor

Model 1 indicated that female patients showed a greater reduction in depression scores compared to male patients (β = -0.02; $p < 0.001$). In model 2, gender remained a significant predictor after adjusting for employment status (β = -0.02; $p < 0.001$) and being in paid employment was associated with a greater reduction in depression scores (β = -0.07; $p < 0.001$). However, the interaction term in Model 3 was not significant, indicating no differences in depression change scores between females in paid employment compared to males in paid employment. Likelihood ratio tests also revealed that there was no significant difference between Model 2 and Model 3.

(iii) Ethnicity stratified by gender as predictor

Regression analyses were conducted to compare White British men to men from Black, Asian and Other minority ethnic (BAME) groups. Model 1 indicated that there were no significant differences between White British and BAME men in depression change scores (β = 0.01; $p = 0.329$). Model 2 indicated that males in paid employment was significantly associated with a greater reduction in depression scores (β = -0.08; $p < 0.001$) and in Model 3 the interaction term was significant (β = -0.03; $p = 0.047$). BAME men who were in paid employment showed a greater reduction in depression scores compared to their White British counterparts. The differences between all models were statistically significant.

Regression analyses comparing White British women to BAME women were conducted separately (Table 5). In Model 1 BAME women showed a greater reduction in depression

scores compared to their White British counterparts (β = -0.03; $p < 0.001$). After adjusting for employment status in Model 2, this association remained significant (β = -0.04; $p < 0.001$) and females in paid employment showed a greater reduction in depression scores (β = -0.08; $p < 0.001$). However, the interaction term in Model 3 was not significant (β = -0.01; $p = 0.205$) indicating no difference in depression change scores between White British and BAME women in paid employment. Likelihood ratio tests also revealed no significant difference between Model 2 and Model 3.

Table 5 Linear regression analyses for variables predicting changes in depression symptoms (N= 46, 684)

	Change in PHQ-9								
	Model 1[a]			Model 2[b]			Model 3[c]		
Predictor Variables	Beta (β)	t statistic	*p* value	Beta (β)	t statistic	*p* value	Beta (β)	t statistic	*p* value
Ethnicity									
White Other	-0.003	-0.53	0.594	-0.003	-0.63	0.527	0.000	-0.06	0.956
Mixed	-0.008	-1.76	0.078	-0.012	-2.60	0.009	-0.011	-1.49	0.136
Asian	0.006	1.39	0.165	0.002	0.39	0.694	0.009	1.35	0.177
Black African	-0.025	-5.36	<0.001	-0.030	-6.53	<0.001	-0.015	-2.34	0.019
Black Caribbean	-0.026	-5.62	<0.001	-0.033	-6.95	<0.001	-0.017	-2.43	0.015
Black Other	-0.003	-0.71	0.475	-0.007	-1.52	0.129	0.000	-0.01	0.988
Other	-0.001	-0.21	0.832	-0.004	-0.97	0.331	-0.004	-0.56	0.575
Paid Employment				-0.078	-16.70	<0.001	-0.066	-10.42	<0.001
White Other in paid emp.							-0.003	-0.39	0.698
Mixed in paid emp.							-0.001	-0.15	0.884
Asian in paid emp.							-0.009	-1.35	0.176
Black African in paid emp.							-0.021	-3.18	0.001
Black Caribbean in paid emp.							-0.021	-3.03	0.002
Black Other in paid emp.							-0.009	-1.40	0.161
Other in paid emp.							<0.001	-0.05	0.957
Gender									
Females	-0.024	-5.32	<0.001	-0.024	-5.37	<0.001	-0.025	-3.41	0.001
Paid Employment				-0.074	-15.89	<0.001	-0.074	-9.53	<0.001
Females in paid emp.							0.001	0.08	0.934
Ethnicity stratified by Males									
BAME Men	0.008	0.98	0.329	-0.001	-0.19	0.852	0.017	1.40	0.160
Men in paid employment				-0.075	-9.46	<0.001	-0.062	-6.08	<0.001
BAME Men in paid emp.							-0.026	-1.99	0.047
Ethnicity stratified by Females									
BAME Women	-0.029	-5.05	<0.001	-0.035	-6.19	<0.001	-0.026	-2.86	0.004
Women in paid employment				-0.076	-13.28	<0.001	-0.069	-8.64	<0.001
BAME Women in paid emp.							-0.013	-1.27	0.205

Note: Negative values for change scores indicate a reduction in PHQ-9 score between first and last treatment session; N for Males = 16, 135; Females = 30, 549

[a] Model 1: Ethnicity, gender and ethnicity stratified by gender entered as separate predictors; partially adjusted for age, borough, highest treatment intensity received and number of sessions attended

[b] Model 2: Partially adjusted models with predictor variables and employment status; [c] Model 3: Fully adjusted after including the interaction term (predictor variable x employment status)

Reference categories: White British (WB); Males; Paid Employment (Paid emp.); Black, Asian and Other Minority ethnic backgrounds (BAME)

4.4.2. Variables predicting change in anxiety symptom scores

(i) Ethnicity as predictor

Regression analyses with variables predicting changes in anxiety symptoms are presented in Table 6. Model 1 indicated that patients from Asian (β = 0.03; $p < 0.001$), Black Caribbean (β = 0.01; $p = 0.002$), Black Other (β = 0.01; $p = 0.005$) and Other (β = 0.01; $p = 0.003$) ethnic groups showed smaller changes in anxiety scores compared to White British patients. After adjusting for employment status in Model 2, Asian patients continued to show significantly smaller changes in anxiety scores compared to White British patients (β = 0.02; $p < 0.001$) but all other associations fully attenuated. Being in paid employment was associated with a greater reduction in anxiety scores (β = -0.11; $p < 0.001$). In Model 3, the interaction between ethnicity and employment was not significant and likelihood ratio tests showed no significant difference between Model 2 and Model 3.

(ii) Gender as predictor

In Model 1, females showed a greater reduction in anxiety scores compared to males (β = -0.02; $p < 0.001$). In Model 2, this association remained significant after adjusting for employment status (β = -0.02; $p < 0.001$) and being in paid employment was associated with greater reductions in anxiety scores (β = -0.12; $p < 0.001$). In Model 3 the interaction term was not significant (β = 0.01; $p = 0.491$) indicating no differences in anxiety change scores between females in paid employment compared to males in paid employment. There was also no significant difference between Model 2 and Model 3.

(iii) Ethnicity stratified by gender as predictor

Model 1 revealed that men from a BAME background showed smaller changes in anxiety scores compared to White British men (β = 0.04; $p < 0.001$). In Model 2, this association remained significant after adjusting for employment status (β = 0.02; $p = 0.007$) and being in paid employment predicted a greater reduction in anxiety scores (β = -0.12; $p < 0.001$). However, in Model 3 there was no significant ethnicity by employment interaction effect (β = -0.00; $p = 0.75$), indicating no differences in anxiety change scores between White British and BAME men in paid employment. Likelihood ratio tests also indicated no significant difference between Model 2 and Model 3.

Finally, women from BAME backgrounds showed smaller changes in anxiety scores compared to White British women (β = 0.02; $p < 0.001$) in Model 1. This association fully attenuated in Model 2 after accounting for employment status (β = 0.01; $p = 0.085$) and paid employment was associated with a greater reduction in anxiety symptoms (β = -0.11; $p < 0.001$). In Model 3 there was no significant ethnicity by employment interaction effect (β = -0.00; $p = 0.977$), indicating no differences in anxiety change scores between White British and BAME women in paid employment. There was also no significant difference between Model 2 and Model 3.

Table 6 Linear regression analyses for variables predicting changes in anxiety symptoms (N= 46, 684)

	Change in GAD-7								
	Model 1[a]			Model 2[b]			Model 3[c]		
Predictor Variables	Beta (β)	t statistic	*p* value	Beta (β)	t statistic	*p* value	Beta (β)	t statistic	*p* value
Ethnicity									
White Other	0.006	1.35	0.177	0.006	1.22	0.224	0.004	0.51	0.611
Mixed	0.009	1.84	0.066	0.003	0.62	0.534	0.007	0.92	0.355
Asian	0.025	5.27	<0.001	0.018	3.84	<0.001	0.016	2.27	0.024
Black African	0.000	0.04	0.971	-0.008	-1.67	0.096	-0.005	-0.78	0.437
Black Caribbean	0.014	3.06	0.002	0.005	1.14	0.256	0.009	1.28	0.201
Black Other	0.013	2.84	0.005	0.008	1.68	0.093	0.006	0.92	0.357
Other	0.014	2.97	0.003	0.009	1.88	0.060	0.006	0.99	0.323
Paid Employment				-0.113	-24.39	<0.001	-0.112	-17.89	<0.001
White Other in paid emp.							0.002	0.26	0.794
Mixed in paid emp.							-0.005	-0.69	0.492
Asian in paid emp.							0.003	0.45	0.655
Black African in paid emp.							-0.004	-0.58	0.563
Black Caribbean in paid emp.							-0.005	-0.71	0.479
Black Other in paid emp.							0.003	0.40	0.686
Other in paid emp.							0.003	0.49	0.624
Gender									
Females	-0.023	-5.05	<0.001	-0.023	-5.15	<0.001	-0.027	-3.74	<0.001
Paid Employment				-0.115	-24.86	<0.001	-0.119	-15.37	<0.001
Females in paid emp.							0.007	0.69	0.491
Ethnicity stratified by Males									
BAME Men	0.036	4.58	<0.001	0.021	2.72	0.007	0.024	1.99	0.047
Men in paid employment				-0.121	-15.25	<0.001	-0.119	-11.62	<0.001
BAME Men in paid emp.							-0.004	-0.32	0.750
Ethnicity stratified by Females									
BAME Women	0.019	3.37	0.001	0.010	1.73	0.085	0.010	1.05	0.293
Women in paid employment				-0.109	-19.13	<0.001	-0.110	-13.75	<0.001
BAME Women in paid emp.							0.000	0.03	0.977

Note: Negative values for change scores indicate a reduction in GAD-7 score between first and last treatment session; N for Males = 16, 135; Females = 30, 549

[a] Model 1: Ethnicity, gender and ethnicity stratified by gender entered as separate predictors; partially adjusted for age, borough, highest treatment intensity received and number of sessions attended

[b] Model 2: Partially adjusted models with predictor variables and employment status; [c] Model 3: Fully adjusted after including the interaction term (predictor variable x employment status)

Reference categories: White British (WB); Males; Paid Employment (Paid emp.); Black, Asian and Other Minority ethnic backgrounds (BAME)

5. Discussion

5.1. Overview of findings

This study employed an intersectional approach to examine mental health inequalities in psychological therapy services in South London. In a sample of IAPT service users across the four boroughs covered by South London and Maudsley (SLAM) NHS Foundation Trust, 46, 684 patients completed first-episode treatment between November 2008 and December 2016. The majority of patients were female, from a White British background and were in paid employment. A higher proportion of patients from White British or White Other ethnic groups were in paid employment compared to all other ethnic groups.

Compared to White British patients, White Other patients were less likely to be allocated to a high intensity intervention upon entry to the service. With the exception of the Asian ethnic group, all other ethnic groups had increased odds of being allocated to a high intensity intervention compared to the White British ethnic group after adjusting for age, borough and employment status. The Asian, Black African and Black Caribbean ethnic groups had decreased odds of attending more than 12 treatment sessions compared to the majority White British ethnic group. After adjusting for age, borough and highest treatment intensity received, the Black Other ethnic group showed a significant decrease in odds of attending more than 12 treatment sessions compared to White British patients. Reliable recovery was most likely for White British patients compared to patients in all other ethnic groups.

Female patients were more likely to receive a high intensity intervention and to meet the threshold for reliable recovery than male patients. There was no gender difference in likelihood of attending more than 12 treatment sessions after adjusting for age, borough and highest treatment intensity received.

This study hypothesised that ethnic minority men and women would have poorer treatment outcomes compared to their White British counterparts. This hypothesis was partially supported in that men and women from Black, Asian and Other minority ethnic (BAME) groups showed smaller reductions in anxiety scores compared to White British men and women. It was also hypothesised that these associations would be impacted by socioeconomic status (SES), with individuals in paid employment having better outcomes. As predicted, being in paid employment was generally associated with better treatment outcomes across different ethnic groups and genders. Black African and Black Caribbean patients in paid employment showed better improvement in depression scores compared to White British patients in paid employment. Asian patients continued to show smaller reductions in anxiety symptoms compared to White British patients after adjusting for employment status.

The interaction between ethnicity, gender and employment status also showed interesting differences. BAME women showed better improvement in depression scores compared to White British women, with no significant interaction effect with employment status. However, BAME men only showed better improvement in depression scores when employment status was taken into account.

5.2. Current findings in relation to previous research

The current findings showing a higher proportion of females and individuals from White British backgrounds referred to IAPT services in South London is consistent with previous studies [10, 41, 65]. In this study, recovery rates were similar to those recently reported by NHS Digital (52.5%) and in previous studies analysing IAPT data (52.6%) [39, 44]. The reliable improvement rate (76.9%) was slightly higher than those reported elsewhere (67.6% and 63.7% respectively) [39, 41]. These findings support previous reports that better treatment outcomes are most likely to occur for female and White British patients [18, 39]. Although females have an increased prevalence of common mental health problems, they are more likely to seek help and be in receipt of treatments such as psychological therapy [18, 66]. Men and individuals from ethnic minority backgrounds are more likely to be deterred from help seeking due to the stigma associated with mental health problems [30]. The fear of stigma, negative perceptions of mental health services and the anticipation of discrimination may be further barriers to seeking help among ethnic minority groups [29, 30, 67]. These factors may have implications for the level of symptom severity that individuals may present with when entering treatment. It is known that higher initial symptom severity is associated poorer clinical outcomes [32, 41]. In this study, patients from ethnic minority groups entered treatment with higher baseline symptoms scores compared to White British patients.

The results of this study also support the finding from the most recent annual IAPT report that Asian patients are least likely to show improvement [39]. In the current study, Asian patients continued to show smaller reductions in anxiety symptoms after adjusting for employment status. Greater mental health inequalities have been a

consistent finding among individuals from Asian ethnic groups [17]. It has been reported that Asian ethnic groups tend to report less satisfaction and less positive experiences of general practitioner services in the UK [18]. Cultural differences among Asian ethnic groups may also influence the recognition of mental health symptoms, the meaning attributed to these symptoms and response to mental health treatment [68, 69].

As previously noted, experiences of unfavourable social and economic circumstances interrelate with individual social characteristics to create patterns of disadvantage or privilege [46, 48, 49]. In the current study, women from Black, Asian and minority ethnic (BAME) groups showed better improvement in depression scores compared to White British women, with no significant interaction effect with employment status. However, men from BAME groups only showed greater reductions in depression scores than White British patients when employment status was taken into account. The existing literature is consistent in reporting greater mental health inequalities among ethnic minorities and inequitable access to mental health services for ethnic minorities and men [7, 10]. Employment status has also been noted as a stronger predictor of men's mental wellbeing than for women [70]. The current study appears to support this notion that being in paid employment may be a protective factor among ethnic minority men. These findings also contribute to the results of a previous study where African, African-Caribbean, Indian and Pakistani ethnic groups were found to have better mental wellbeing than expected [71]. Women from BAME backgrounds in this study benefited from psychological treatment for depression irrespective of their employment status.

However, there was a different pattern in anxiety symptom change scores following treatment, whereby men and women from Black, Asian and Other minority ethnic (BAME) groups showed smaller reductions in anxiety scores compared to White British men and women. This is consistent with previous findings that men and women from White ethnic groups are more likely to recover or show reliable improvement compared to other ethnic groups [18, 39]. Greater exposure to trauma, adverse life events, experienced and anticipated discrimination may contribute to poorer treatment outcomes among ethnic minority groups receiving psychological therapy for anxiety disorders. Illness and treatment beliefs among ethnic minority groups may also affect treatment adherence and outcome [72].

Better recovery has been found to be associated with treatment characteristics, such as higher intensity interventions and greater number of treatment sessions [32, 41]. Although specific ethnic minority groups were identified as being more likely to receive a high intensity intervention compared to the White British ethnic group, recovery was most likely for White British patients compared to all other ethnic groups. As previously discussed, ethnic minority groups in this study had more severe initial symptoms and this is known to be a predictor of better clinical outcomes. The finding that Asian and Black ethnic groups were less likely to attend more than 12 treatment sessions may be associated with levels of treatment engagement among these groups. Establishing rapport and trust as well as clinicians being able to confidently discuss issues related to ethnicity and culture are important factors to consider [73]. However, treatment engagement could not be explored in this study.

5.3. Strengths and Limitations

This study is limited in that patients with missing data for key socio-demographic and outcome variables could not be included in the analyses. This has been a limitation of previous studies that have also been unable to accurately characterise those who dropped out or were excluded from the analyses [32, 41]. Improving completeness of ethnicity data in particular has been identified as a key factor in improving equity of outcomes among individuals from ethnic minority groups [36]. However, it is important to note that this study included data collected from the beginning of IAPT services in 2008 and data completeness has improved since then [43].

There are limitations to using a single indicator of SES. In this study, employment status was used as the main indicator of SES as it was most frequently and reliably recorded. Inadequate data on SES continues to hinder the ability to fully investigate inequalities [74]. This is an issue that has improved in IAPT services, with details of employment, receipt of benefits and statutory sick pay being included as part of IAPT's minimum dataset [36]. Treatment engagement could not be explored in this study as an outcome due to differences in how this information was recorded. Improving consistency in how referrals and discharge data are recorded in IAPT services will help to more clearly ascertain whether or not patients began treatment and then dropped out or completed. This is an important factor to consider when assessing mental health inequalities.

It is of further importance to consider the intersection of ethnicity and migration status, as differences in migrant experiences are known to be associated with different patterns of social, economic and mental health disadvantage [74-76]. The study was also unable

to examine the impact of migration status on mental health inequalities due to limitations of an appropriate indicator in the data available. The addition of an appropriate indicator of migrant status as part of IAPT's key demographic data would enable these analyses to be carried out in the future.

This study has important strengths. It answered the call for further research using a detailed approach to better understand differences in clinical outcomes following psychological treatment for common mental health problems [32]. Specifically, this study utilised a large dataset of routinely recorded data in IAPT services to evaluate whether mental health inequalities exist in psychological therapy services in South London. The availability of routinely recorded data in services such as IAPT not only improves public transparency of mental health outcomes but also enables analyses that contribute to efforts to reduce mental health disparities [43].

This is one of few studies that has investigated the association between patient level characteristics such as ethnicity, gender, socio-economic status and treatment outcomes following psychological therapies for common mental health problems; a limitation that has been previously noted [32, 33]. More importantly, this study employed an intersectional approach to the understanding of how the intersection of these individual characteristics jointly impact mental health treatment outcomes. The findings support the notion that analysis of single social characteristics can lead to misleading conclusions [50, 77]. Without this approach, greater reductions in depression scores among BAME men in paid employment, compared to White British men in paid employment would not otherwise have been identified. Finally, the study was able to

identify specific groups that are more likely to be allocated to a higher treatment intensity, least likely to attend more than 12 treatment sessions and more likely to meet the reliable recovery threshold. To our knowledge, specific groups more likely to receive treatment characteristics associated with better clinical outcome have not yet been identified.

5.4. Clinical implications

The finding that paid employment was associated with better treatment outcomes support the need for employment support services within IAPT services to aid recovery. In this study, employment status was an important factor among ethnic minority men. Although employment or careers management services are currently offered in all IAPT services provided by SLAM, this finding has implications for employment related interventions being a priority among this particular group.

The finding that ethnic minority men and women showed smaller reductions in anxiety symptoms compared to White British men and women, warrants further investigation. The finding that Asian patients showed smaller reductions in anxiety symptoms following psychological therapy is also worth further exploration; especially since previous reports point to this being a consistent finding among this ethnic group. It may be important to discuss experiences of discrimination when working with patients from ethnic minority groups. It is of equal importance that clinicians are able to establish trusting relationships and feel confident to discuss these experiences when working with patients from an ethnic minority background [73]. These experiences may be

incorporated in the development of formulations to identify potential maintaining factors as well as areas for intervention during psychological therapy [73].

IAPT services usually seek feedback from patients at the end of treatment by distributing Patient Experience Questionnaires (PEQs) [36]. However, it may be important for services to create other opportunities for patients from specific groups known to have poorer treatment outcomes to be able to provide more detailed feedback throughout and following treatment. This may not only provide a better understanding of factors that may reduce the likelihood of these groups benefiting from psychological treatment, but may also offer opportunities to co-produce interventions and to bridge gaps between patients from specific groups and mental health services.

This study identified specific groups more likely to receive treatment characteristics associated with better clinical recovery. Despite some ethnic groups being more likely to receive higher treatment intensity, differences in recovery and change in symptom scores remained. These results further support the need to adopt an approach that takes into account the complex interrelationships between individual characteristics such as ethnicity, gender and employment status. By focusing on specific ethnic groups or genders, groups disadvantaged or privileged by the intersection of these multiple characteristics may be missed by services. Interventions aimed at reducing mental health inequalities in UK psychological therapy services should routinely account for the intersection of individual social characteristics.

5.5. Research implications

Future research investigating treatment outcomes in IAPT services should seek to employ an intersectional approach to expand the current understanding of mental health inequalities in the UK. The impact of other indicators of socio-economic status such as level of education and household income on clinical outcomes in IAPT services may also be investigated. Debt has also been identified as having a strong association with the use of talking therapies [78]. Such research will be able to ascertain whether different patterns of mental health inequalities emerge at the intersection of individual characteristics and different markers of socio-economic status. Future research should also examine the association between level of engagement and treatment outcomes.

5.6. Conclusions

This study supported the notion that it is important to jointly consider the effects of individual characteristics such as ethnicity, gender and socio-economic status on treatment outcomes following psychological therapies for depression and anxiety [33]. Employment status was an important factor to be considered among ethnic minority men. Future studies should seek to employ an intersectional approach in order to identify further patterns of disadvantage or privilege associated with mental health treatment outcomes.

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7. Appendices

Appendix 1 – Letter of Approval from Health Research Authority

NHS
Health Research Authority

Dr Stephani Hatch
Reader in Sociology and Epidemiology
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Email: hra.approval@nhs.net

15 November 2017

Dear Dr Hatch

Letter of HRA Approval

Study title:	**Tackling Inequalities and Discrimination Experiences in Health Services**
IRAS project ID:	**230692**
Protocol number:	**V1_251017**
REC reference:	**18/HRA/0368**
Sponsor	**King's College London**

I am pleased to confirm that **HRA Approval** has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications noted in this letter.

Participation of NHS Organisations in England

The sponsor should now provide a copy of this letter to all participating NHS organisations in England.

Appendix B provides important information for sponsors and participating NHS organisations in England for arranging and confirming capacity and capability. **Please read *Appendix B* carefully**, in particular the following sections:

- *Participating NHS organisations in England* – this clarifies the types of participating organisations in the study and whether or not all organisations will be undertaking the same activities
- *Confirmation of capacity and capability* - this confirms whether or not each type of participating NHS organisation in England is expected to give formal confirmation of capacity and capability. Where formal confirmation is not expected, the section also provides details on the time limit given to participating organisations to opt out of the study, or request additional time, before their participation is assumed.
- *Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)* - this provides detail on the form of agreement to be used in the study to confirm capacity and capability, where applicable.

Further information on funding, HR processes, and compliance with HRA criteria and standards is also provided.

It is critical that you involve both the research management function (e.g. R&D office) supporting each organisation and the local research team (where there is one) in setting up your study. Contact details and further information about working with the research management function for each organisation can be accessed from the HRA website.

Appendices

The HRA Approval letter contains the following appendices:

- A – List of documents reviewed during HRA assessment
- B – Summary of HRA assessment

After HRA Approval

The attached document *"After HRA Approval – guidance for sponsors and investigators"* gives detailed guidance on reporting expectations for studies with HRA Approval, including:

- Working with organisations hosting the research
- Registration of Research
- Notifying amendments
- Notifying the end of the study

The HRA website also provides guidance on these topics and is updated in the light of changes in reporting expectations or procedures.

Scope

HRA Approval provides an approval for research involving patients or staff in NHS organisations in England.

If your study involves NHS organisations in other countries in the UK, please contact the relevant national coordinating functions for support and advice. Further information can be found through IRAS.

If there are participating non-NHS organisations, local agreement should be obtained in accordance with the procedures of the local participating non-NHS organisation.

User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please use the feedback form available on the HRA website.

HRA Training

We are pleased to welcome researchers and research management staff at our training days – see details on the HRA website.

Your IRAS project ID is **230692**. Please quote this on all correspondence.

Yours sincerely

Steph Macpherson
Senior Assessor

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Copy to: *Mr Keith Brennan King's College London [Sponsor]*
Ms Jennifer Liebscher, South London and Maudsley NHS Foundation Trust [Lead NHS R&D]

Participating NHS organisations in England

Appendix A - List of Documents

The final document set assessed and approved by HRA Approval is listed below.

Document	*Version*	*Date*
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [KCL Insurances 2017-2018]		
HRA Schedule of Events [Schedule of Events]	1	14 November 2017
HRA Statement of Activities [Statement of Activities]	1	14 November 2017
Interview schedules or topic guides for participants [Topic Guides - Focus group with healthcare practitioners_V1_251017]	1	25 October 2017
Interview schedules or topic guides for participants [Topic Guides - Focus group with community members_V1_251017]	1	25 October 2017
IRAS Application Form [IRAS_Form_15112017]		15 November 2017
Letter from funder [Welcome Trust Funding Letter_V1_251017]		25 October 2017
Letter from sponsor [Confirmation of sponsorship_V1_061117]	1	06 November 2017
Letters of invitation to participant [Approach Letter to Gatekeepers_V1_251017]	1	25 October 2017
Letters of invitation to participant [Approach Email to Participants_V1_251017]	1	25 October 2017
Participant consent form [Consent Form (Study 1 - Online Form)_V1_251017]	1	25 October 2017
Participant consent form [Consent Form (Study 2 - Focus Groups)_V1_251017]	1	25 October 2017
Participant consent form [Consent Form (Study 2 - In-depth Interviews with Senior Staff)_V1_251017]	1	25 October 2017
Participant information sheet (PIS) [Information Sheet for Participants (Study 1)_V1_251017]	1	25 October 2017
Participant information sheet (PIS) [Information Sheet for Participants (Study 2 - Focus groups with community members)_V1_251017]	1	25 October 2017
Participant information sheet (PIS) [Information Sheet for Participants (Study 2 - Focus groups with HCPs)_V1_251017]	1	25 October 2017
Participant information sheet (PIS) [Information Sheet for Participants (Study 2 - In-depth interviews with senior staff)_V1_251017]	1	25 October 2017
Research protocol or project proposal [TIDES Protocol_V1_251017]	1	25 October 2017
Summary CV for Chief Investigator (CI) [Chief Investigator CV_V1_251017]		25 October 2017
Validated questionnaire [Study 1 Survey_V1_251017]		

Appendix B - Summary of HRA Assessment

This appendix provides assurance to you, the sponsor and the NHS in England that the study, as reviewed for HRA Approval, is compliant with relevant standards. It also provides information and clarification, where appropriate, to participating NHS organisations in England to assist in assessing and arranging capacity and capability.

For information on how the sponsor should be working with participating NHS organisations in England, please refer to the *participating NHS organisations*, *capacity and capability* and *Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)* sections in this appendix.

The following person is the sponsor contact for the purpose of addressing participating organisation questions relating to the study:

Name: Keith Brennan
Email: keith.brennan@kcl.ac.uk

HRA assessment criteria

Section	HRA Assessment Criteria	Compliant with Standards	Comments
1.1	IRAS application completed correctly	Yes	No comments
2.1	Participant information/consent documents and consent process	Yes	No comments
3.1	Protocol assessment	Yes	No comments
4.1	Allocation of responsibilities and rights are agreed and documented	Yes	The Sponsor has submitted a Statement of Activities and Schedule of Events and intend that these act as the agreement with sites. Although formal confirmation of capacity and capability is not expected of all or some organisations participating in this study (see *Confirmation of Capacity and Capability* section for full details), and such organisations would therefore be assumed to have confirmed their

Section	HRA Assessment Criteria	Compliant with Standards	Comments
			capacity and capability should they not respond to the contrary, we would ask that these organisations pro-actively engage with the sponsor in order to confirm at as early a date as possible. Confirmation in such cases should be by email to the CI and Sponsor confirming participation based on the relevant Statement of Activities and information within this Appendix B.
4.2	Insurance/indemnity arrangements assessed	Yes	Where applicable, independent contractors (e.g. General Practitioners) should ensure that the professional indemnity provided by their medical defence organisation covers the activities expected of them for this research study
4.3	Financial arrangements assessed	Yes	The study is funded by the Welcome Trust.
5.1	Compliance with the Data Protection Act and data security issues assessed	Yes	No comments
5.2	CTIMPS – Arrangements for compliance with the Clinical Trials Regulations assessed	Not Applicable	No comments
5.3	Compliance with any applicable laws or regulations	Yes	No comments
6.1	NHS Research Ethics Committee favourable opinion received for applicable studies	Not Applicable	The Applicant has confirm that current receipt of NHS treatment is NOT an eligibility criteria for this study.
6.2	CTIMPS – Clinical Trials Authorisation (CTA) letter received	Not Applicable	No comments
6.3	Devices – MHRA notice of no objection received	Not Applicable	No comments
6.4	Other regulatory approvals	Not Applicable	No comments

IRAS project ID	230692

Section	HRA Assessment Criteria	Compliant with Standards	Comments
	and authorisations received		

Participating NHS Organisations in England

This provides detail on the types of participating NHS organisations in the study and a statement as to whether the activities at all organisations are the same or different.
There is one site type in the study. Healthcare practitioners will complete a 45-minute questionnaire if they wish to participate. Healthcare practitioners may choose to either attend a survey interview to take place at King's College London facilities or complete the survey online in their own time. In order to recruit the HCP sample, key gatekeepers for accessing foundation and trainee doctors, nurses, healthcare assistants and IAPT workers will be contacted to gain permission for the research study to be conducted. The Chief Investigator or sponsor should share relevant study documents with participating NHS organisations in England in order to put arrangements in place to deliver the study. The documents should be sent to both the local study team, where applicable, and the office providing the research management function at the participating organisation. For NIHR CRN Portfolio studies, the Local LCRN contact should also be copied into this correspondence. For further guidance on working with participating NHS organisations please see the HRA website. If chief investigators, sponsors or principal investigators are asked to complete site level forms for participating NHS organisations in England which are not provided in IRAS or on the HRA website, the chief investigator, sponsor or principal investigator should notify the HRA immediately at hra.approval@nhs.net. The HRA will work with these organisations to achieve a consistent approach to information provision.

Confirmation of Capacity and Capability

This describes whether formal confirmation of capacity and capability is expected from participating NHS organisations in England.
The HRA has determined that participating NHS organisations in England **are not expected to formally confirm their capacity and capability to host this research,** because Healthcare practitioners will complete a 45-minute questionnaire if they wish to participate. Healthcare practitioners may choose to either attend a survey interview to take place at King's College London facilities or complete the survey online in their own time. • The HRA has informed the relevant research management offices that you intend to undertake the research at their organisation. However, you should still support and liaise with these organisations as necessary. • Following issue of the HRA Approval letter, and subject to the two conditions below, it is expected that these organisations will become participating NHS organisations 35 days after

issue of this Letter of HRA Approval (no later than **20 December 2017**):
  - You may not include the NHS organisation if they provide justification to the sponsor and the HRA as to why the organisation cannot participate
  - You may not include the NHS organisation if they request additional time to confirm, until they notify you that the considerations have been satisfactorily completed..
- You may include NHS organisations in this study in advance of the deadline above where the organisation confirms by email to the CI and sponsor that the research may proceed.
- The document "Collaborative working between sponsors and NHS organisations in England for HRA Approval studies, where no formal confirmation of capacity and capability is expected" provides further information for the sponsor and NHS organisations on working with NHS organisations in England where no formal confirmation of capacity and capability is expectations, and the processes involved in adding new organisations. Further study specific details are provided the *Participating NHS Organisations* and *Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)* sections of this Appendix.

Principal Investigator Suitability

This confirms whether the sponsor position on whether a PI, LC or neither should be in place is correct for each type of participating NHS organisation in England and the minimum expectations for education, training and experience that PIs should meet (where applicable).
Staff will act as participants in this study. All activity will be undertaken by the central study team. In order to recruit the HCP sample, key gatekeepers for accessing foundation and trainee doctors, nurses, healthcare assistants and IAPT workers will be contacted to gain permission for the research study to be conducted. GCP training is not a generic training expectation, in line with the HRA/MHRA statement on training expectations.

HR Good Practice Resource Pack Expectations

This confirms the HR Good Practice Resource Pack expectations for the study and the pre-engagement checks that should and should not be undertaken
No access arrangements are required.

Other Information to Aid Study Set-up

This details any other information that may be helpful to sponsors and participating NHS organisations in England to aid study set-up.
The applicant has indicated that they intend to apply for inclusion on the NIHR CRN Portfolio.

Appendix 2 – Supplemental Table

Supplementary Table 1 Socio-demographic, socio-economic and treatment characteristics by SLAM borough (N = 46, 684)

		Croydon		**Lambeth**		**Lewisham**		**Southwark**	
		N = 5,080 %		N= 16,085 %		N = 15,464 %		N = 10,055 %	
Age - Mean (S.D.)		40.62 (13.99)		36.04 (11.78)		38.23 (12.89)		38.02 (13.04)	
Gender	Male	1,696	33.39	6,017	37.41	5,019	32.46	3,403	33.84
	Female	3,384	66.61	10,068	62.59	10,445	67.54	6,652	66.16
Ethnicity	White British	3,028	59.61	9,459	58.81	8,271	53.49	5,812	57.80
	White Other	413	8.13	1,830	11.38	2,244	14.51	1,479	14.71
	Mixed	263	5.18	892	5.55	848	5.48	466	4.63
	Asian	553	10.89	989	6.15	792	5.12	606	6.03
	Black African	185	3.64	419	2.60	922	5.96	452	4.50
	Black Caribbean	426	8.39	1,751	10.89	1,869	12.09	764	7.60
	Black Other	77	1.52	414	2.57	236	1.53	253	2.52
	Other	135	2.66	331	2.06	282	1.82	223	2.22
Employment Status	Paid Employment	2,954	58.15	10,461	65.04	9,280	60.01	5,999	59.66
	Not in Paid Employment	2,126	41.85	5,624	34.96	6,184	39.99	4,056	40.34
Benefits Status	Not in receipt of benefits	3,913	77.03	13,060	81.19	12,220	79.02	7,783	77.40
	Receiving benefits	983	19.35	2,993	18.61	3,212	20.77	1,989	19.78
	Missing	184	3.62	32	0.20	32	0.21	283	2.81

Statutory Sick Pay (SSP)	Not in receipt of SSP	4,559	89.74	14,877	92.49	14,013	90.62	9,507	94.55
	Receiving SSP	518	10.20	1,182	7.35	1,409	9.11	526	5.23
	Missing	3	0.06	69	0.43	42	0.27	22	0.22
Treatment Allocation	Low Intensity	2,783	54.78	10,726	66.68	7,230	46.75	3,974	39.52
	High Intensity	2,297	45.22	5,359	33.32	8,234	53.25	6,081	60.48
Treatment Sessions Attended	Up to 12 sessions	4,096	80.63	13,540	84.18	13,684	88.49	7,545	75.04
	> 12 sessions	984	19.37	2,545	15.82	1,780	11.51	2,510	24.96
Recovery	Recovered	2,842	55.94	9,603	59.70	8,368	54.11	4,908	48.81
	Not Recovered	2,238	44.06	6,482	40.30	7,096	45.89	5,147	51.19
Reliable Improvement	Reliably Improved	3,889	76.56	12,838	79.81	12,028	77.78	7,204	71.65
	Not Reliably Improved	1,191	23.44	3,247	20.19	3,436	22.22	2,851	28.35
Reliable Recovery	Reliably Recovered	2,791	54.94	9,366	58.23	8,193	52.98	4,732	47.06
	Not Reliably Recovered	2,289	45.06	6,719	41.77	7,271	47.02	5,323	52.94

Note: Total Ns for Benefits and Statutory Sick Pay Status (pre-treatment) vary due to missing data in these variables.

Other ethnic group = Patients categorised as Arab or Any Other ethnic group using UK Census categories