Mental health outcome inequalities in IAPT services: An investigation of the minority stress hypothesis

A thesis submitted in partial fulfilment of the requirements for the degree of

Doctorate in Clinical Psychology

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Declaration

I confirm this thesis is my own work. This thesis has been submitted for the award of Doctorate in Clinical Psychology at the University of Sheffield. It has not been submitted to any other institution or for the purposes of obtaining any other qualification.

Structure and Word Count

Section 1: Literature review

i-	Word count excluding references and tables:	7,995
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Lay summary

Research has shown ethnic minority communities have poorer access and recovery rates in Improving Access to Psychological Therapies (IAPT), now known as NHS Talking Therapy Services when compared with the White British ethnic group. Previous research has shown that these differences are still evident even after controlling for socioeconomic status.

The first chapter, a systematic literature review, explored the association between individualistic and collectivist core values and symptoms of depression and anxiety. A total of 28 papers were included in the review following a comprehensive search in databases and grey literature. The results from these studies were heterogeneous, however, it appeared that collectivism reduced depression and increased social anxiety. There were differences in trauma memories in post-traumatic stress disorder as those more individualistic values had more appraisals of mental defeat. The review also found that core values of individualism/ collectivism and depression/ anxiety can act as mediators or moderators. Again, these findings were not conclusive. Overall, this review highlighted the need for therapists to explore cultural core values with patients to help deliver culturally sensitive care and the need for further research.

The second chapter aimed to investigate minority stress and ethnic density effects as possible predictors of treatment response for patients who access IAPT services. Healthcare records of 130,857 patients were analysed using multilevel modelling. Outcome measures for depression, anxiety and functioning were linked to neighbourhood ethnic density data. The results found some support for the minority stress effect (after controlling for socioeconomic deprivation and employment status), but only relevant to patients from *Black Caribbean, Black- other and White – other*

backgrounds. This study highlighted a need for further research to explore ethnic health inequalities.

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Part One: Literature Review

A systematic review of associations between collectivist - individualistic core values and symptoms of anxiety or depression

Abstract

Aim: There is scarce research exploring factors affecting the mental health of ethnic minority communities. To explore this further, this review intended to examine the association between collectivist - individualistic core values and symptoms of anxiety or depression.

Methods: A systematic review (Open Science Framework (OSF) registration link https://osf.io/y8pcq/?view_only=2c8328016e4147098ca1e023c2fc80e5) was completed via searches conducted across three databases (PsychINFO, Scopus and Web of Science). Grey literature was searched using the database www.proquest.com. A total of 28 studies were included in the review. The Critical appraisal Skills Programme (CASP) checklist was used to complete the risk of bias assessments. Narrative synthesis was used to synthesise findings across studies that examined [a] associations, [b] moderator hypotheses, and [c] mediator hypotheses related to core values and mental health.

Results: The results from these studies were heterogeneous and not conclusive, however, it appeared that collectivism reduced depression and increased social anxiety. The studies on PTSD also seemed to indicate individualistic and collectivist core values moderated trauma memories. The review also found core values of individualism/ collectivism and depression/ anxiety can also act as mediators or moderators between different independent variables and mental health outcomes.

Conclusion: Overall, this review highlighted the need for therapists to explore cultural core values with patients to adapt therapy to avoid “cultural ruptures” and to provide culturally sensitive care alongside the need for further research.

Practitioner points

- Individualistic and collectivist core values may contribute to the development and maintenance of psychological distress.

- Exploring core values with patients can facilitate the delivery of culturally adapted and sensitive interventions.

- Imposing treatments that conflict with patients' cultural values may result in microaggression and "cultural ruptures" leading to poorer experiences and outcomes in psychological treatments.

Keywords: culture, cultural values, core values, individualism, collectivism, ethnic minority, mental health, depression, anxiety, social phobia, social anxiety, post-traumatic stress disorder, PTSD, cultural adaptations, cognitive behaviour therapy, CBT

INTRODUCTION

There is increasing evidence that the needs of ethnic minority communities are not being adequately met by mental health and psychological therapy services as recently shown in a report commissioned by the NHS Race and Health Observatory (NHS Race and Health Observatory, 2023). The report shows differences in clinical outcomes for various ethnic minority groups. For example, Pakistani and Bangladeshi communities have the poorest outcomes in IAPT (Improving Access to Psychological Therapies now known as NHS Talking Therapies), relative to other ethnic groups. In 2021-22 their recovery rates were 43.4% and 43.9% respectfully, by comparison to national recovery rates which were 50.1% in 2022 (National Health Service Digital [NHS Digital], 2022). Both communities also had the lowest rates of having a course of treatment (Pakistani-47.28%; Bangladeshi, 47.19%). The drop-out rate for the Pakistani and Bangladeshi groups was approximately 20% (access rate for the Pakistani group was 68.49% and the Bangladeshi group 65.96%). These health inequalities related to ethnicity clearly indicate the need to understand the causes of variability in treatment utilisation and outcomes for different ethnic groups, in order to address and improve health outcomes.

Factors contributing to differential outcomes for ethnic minority communities

Overall, there is scarce research exploring factors affecting the mental health of ethnic minority communities. A plausible psychosocial construct that may be relevant to explain this, is the notion of core values, which some authors have conceptualised as related to collectivist vs. individualistic values. For the purpose of this review, these will be referred to as I-C values.

There is some emerging evidence there may be some relationship between I-C values and symptoms of depression and anxiety. Kirsh and Kuiper (2002), explored the themes of individualism and relatedness (i.e., collectivism) in the context of depression and gender. Drawing upon previous research, they discuss men are socialised to be more individualistic orientated and women to be more collectivist orientated. A mismatch between how men and women personally identify and societal expectations of gender appropriateness for each of these can lead to an increase in depression. However, as this mismatch is more evident in women, it results in higher rates of depression in women (Kirsh and Kuiper, 2002).

Heinrich's et al., (2006) investigated individuals' perceived cultural norms and their relationship to social anxiety and blushing. They presented 909 participants from eight countries (grouped into individualistic and collectivist countries) with vignettes describing social situations and asked them to evaluate the social acceptability of the main actor in the scenarios from their personal and a cultural viewpoint. Heinrich's et al., (2006) found that individuals from collectivist countries were significantly more socially anxious and fearful of blushing than individuals from individualistic countries.

In a study with 176 Malaysian college students, Wai et al., (2019) investigated the relationship between depressive symptoms and collectivist coping styles (CCS) by asking participants to complete the Short Warwick-Edinburgh Mental Well-Being Scale (SWEMWBS, Stewart-Brown et al., 2011; Tennant et al., 2007) and the Collectivist Coping Styles Inventory (Heppner et al., 2006). Their analysis found collectivist coping was linked to improved mental well-being.

These studies seem to indicate there is a link between I-C values and mental health. In terms of the impact of I-C values on therapy, some authors have proposed that psychological therapy may be less effective when patients from ethnic minority communities perceive microaggressions, which might undermine the therapeutic alliance and patients' sense of the extent to which the therapist is trustworthy (Owen et al. 2014). Such experiences have been described as "cultural ruptures", to describe a process where the working alliance is undermined by a perceived mismatch between the cultural worldview of the therapist and the patient, with adverse impact on clinical outcomes (Owen et al., 2011).

Owens et al., (2011) explored whether client's perceptions of microaggressions in therapy were based on their views of theirs and the therapist's ethnicity and whether the therapeutic alliance would mediate against this. Their sample comprised of 232 clients and 29 therapists. The study involved asking participants to complete surveys; the Racial Microaggressions in Counseling Scale (RMCS; Constantine, 2007) and Individual Treatment Alliance Scale Revised-Short Form (ITASr-SF; Pinsof et al., 2008). Owen's et al., (2011) hypothesised that clients from ethnic minority backgrounds would report experiencing more microaggressions when working with white therapists than when working with therapists from ethnic minority backgrounds. An interesting finding in this literature is that, while clients' perceptions of microaggressions are associated with poorer alliance and wellbeing ratings, ethnicity-match or mismatch is not significantly associated with microaggressions and therapy outcomes (Owen et al., 2011). These findings imply that cultural ruptures can occur even when the patient and therapists are from the same ethnic background (e.g., ethnicity-match). This observation suggests that there may be other psychosocial processes at play in these encounters where

cultural ruptures or microaggressions are perceived by the patient, which transcend the surface level of ethnic similarity or difference.

One of the factors that could be contributing to poorer access and outcomes for ethnic minority communities is the misalignment of the therapy values and patients' core values i.e., I-C values, and the lack of culturally sensitive/ adapted care (Beck, 2016). According to Naeem (2012), cultural adaptations involve making adaptations in how therapy is delivered related to a given culture, without compromising on theoretical underpinnings of CBT (Naeem, 2012). To address this Beck et al., (2019) and Naz et al., (2019) have developed frameworks to support mental health practitioners and services to deliver culturally sensitive care alongside making systemic changes (Beck & Naz, 2019).

Collectivist-individualistic values

According to Triandis et al., (1988) individualism and collectivism are two different dimensions of cultural variations, but may co-exist (Li & Aksoy, 2007). Collectivists may subordinate their goals in favour of the in-group, whereas individualists are part of various in-groups each with their own goals (Triandis et al., 1988). At the psychological level, they are labelled as allocentrism and idiocentrism (Triandis et al., 1988). However, for Hofstede (1980), I-C values are at the opposite sides of a single cultural dimension.

According to Parsons (1951), the basic function of values is to motivate and control the behaviour of group members. For Schwartz (1992), values are used to characterise cultural groups and explain the motivations behind attitudes and

behaviours. Values can influence coping patterns across different cultures (Bhagat et al., 2009; Kuo, 2011).

Various measures have been used to capture the concepts of individualism and collectivism. These include the Individualism and Collectivism Scale (INDCOLa; Singelis et al., 1995) and Schwartz Values Scale (SVS; Schwartz 1992, 2006).

The INDCOLa (Singelis et al., 1995) is a 32-item scale designed to measure the four measures of individualism and collectivism; Vertical Collectivism (VC); Vertical Individualism (VI); Horizontal Collectivism (HC); Horizontal Individualism (HI). With VC, individuals view themselves as a part of a collective, but accept people are different and unequal (Singelis et al., 1995; Li & Aksoy, 2007). Within VI, individuals view themselves as fully autonomous, but accepting inequality exists amongst individuals (Singelis et al., 1995; Li & Aksoy, 2007). HC is where individuals view themselves as part of a collective, and perceive all the members of that collective as equal (Singelis et al., 1995; Li & Aksoy, 2007). HI is where individuals view themselves as fully autonomous, but as equals (Singelis et al., 1995; Li & Aksoy, 2007).

The SVS (Schwartz, 1992, 2006) represents two lists. The first describes desirable end-states and the second the desirable actions to achieve the end-states. Schwartz's (2012) value theory states there are ten types of values. These are self-direction; stimulation; hedonism; achievement; power; security; conformity; transition; benevolence; universalism. According to Schwartz (1992), all cultures have these values, but they may have different value "priorities" or "hierarchies." Schwartz (2012) also states there are six main features of values. These are values as beliefs, they refer to desirable goals, they transcend specific actions and situations;

they serve as standards, they are ordered in terms of priority; and their importance guides action. Individuals are asked to rate the importance of each value scale.

Recent studies have taken interest in exploring the relationship between values and mental health. Shekriladze et al., (2021), found I-C values moderated anxiety's effect on coping during the Covid-19 pandemic. Grégoire et al., (2021) found daily value-based actions were positively associated with daily wellbeing. Arens et al., (2022) found patients with mental health difficulties displayed more incompatible values than those in the control group. They viewed the values of power, achievement and tradition/ conformity higher than the general population. Findings support previous research by Hanel et al., (2018), and Sortheix & Schwartz (2017). Prior to this, Lundgren et al., (2012) found those who felt there was a discrepancy between their values and actions had poorer mental health.

Overall, there is emerging literature investigating associations between values and mental health and wellbeing constructs, which could help explain other factors affecting the experiences and therapy outcomes of patients from ethnic minority backgrounds. As a comprehensive review of this literature is lacking. This review will aim to address this gap in literature.

Research Aims

To my knowledge this is the first systematic review examining the association between collectivist - individualistic core values and symptoms of anxiety or depression. Specific objectives that guided the review were to synthesise findings across studies that examined [a] associations, [b] moderator hypotheses, and [c] mediator hypotheses related to core values and mental health.

METHODS

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement was used to guide this review (Page et al., 2021). Preliminary scoping searches were completed in PsycINFO with the purpose of refining the sensitivity and specificity of the search strategy to ensure the search was as comprehensive as possible. The protocol for this review was pre-registered in the Open Science Framework (OSF) in July, 2023 (https://osf.io/y8pcq/?view_only=2c8328016e4147098ca1e023c2fc80e5

Search strategy

Systematic searches were conducted across three databases (PsychINFO, Scopus and Web of Science) between 1-7 July, 2023 to gather studies across the databases. No date restrictions were applied in order to conduct a comprehensive review of all relevant studies published to date. Only studies in English were sought for this review. Grey literature was searched using the database www.proquest.com.

The following variations of key search terms were combined to search for articles in the titles and keywords section of the databases:

1. anxiety OR depress*

2. individualis* or collectivis*

3. “Schwartz Values Survey” OR “SVS”

4. “Pairwise Comparison Value Survey” OR “PCVS”

5. “Individualism-Collectivism Scale” OR “ICS”

6. (1 AND 2) OR (1 AND 3) OR (1 AND 4) OR (1 AND 5)

Study eligibility criteria

The Population, Intervention, comparison, Outcomes and Study (PICOS) framework (Richardson, et al., 1995) was used to define the research question and eligibility criteria (Table 1). Eligible studies were grouped together in terms of association and mediator/ moderator studies for syntheses. Due to the heterogeneity of the studies included in the review, association studies were further grouped into studies that provided overall measures or sub-scales and mediator or moderator analyses. All eligible studies were included in the review regardless of their methodological quality, inclusive of grey literature, in order to undertake a comprehensive review of this literature and to consider the findings in light of a formal risk of bias assessment.

Table 1

Inclusion and Exclusion Criteria

	Inclusion	Exclusion
Population	Studies where the majority (>50%) of participants are 18+ and have completed quantitative and psychometrically validated measures of the constructs of interest (e.g., core values; depression and/or anxiety). Studies from both clinical and non-clinical samples	Studies where most participants are under the age of 18 will be excluded.
Intervention	Not relevant	
Comparison	Not relevant	
Outcomes	Studies that include psychometrically reliable and validated measurements of depression and/or anxiety symptoms, including measures of psychological distress that capture both types of symptoms/domains.	Studies that do not include psychometrically reliable and validated measurements of depression or anxiety symptoms.
	Studies that include psychometrically valid measures of core values, based on the collectivist – individualistic construct and continuum.	Studies that do not include psychometrically valid measures of core values, based on the collectivist – individualistic. construct and continuum.
Study	Clinical and non-clinical samples. Quantitative studies of various designs will be eligible for inclusion; including observational and experimental studies. Studies should report some quantitative index of associations between the constructs of interest (common mental health problems; core values defined according to the collectivist – individualistic construct.	Qualitative studies

Study selection

Following the removal of duplicate articles, articles were screened by title and abstract. Full-text articles were screened against the inclusion and exclusion criteria. Forward and backward citation searches were conducted of papers included in the review to identify any additional eligible studies that may have been missed in the initial searches. Eligible studies included both non-clinical samples and clinical samples receiving treatment for common mental health problems.

Data extraction and synthesis

Data extraction was completed by the author. The information extracted was agreed with the research supervisor. Only information related to each study's primary data analysis was extracted.

Validated measurements of depression and/or anxiety symptoms, measures of core values were sought. Data extraction focused primarily on quantitative indices of associations between core values (I-C values) and measures of common mental health problems (e.g., correlations or regression coefficients).

Other information extracted from primary studies included the following:

- Author names
- Year of publication
- Country
- The characteristics of the sample (e.g., clinical/non-clinical, mean age, gender, diagnosis, ethnicity, where participants are recruited from, type of treatment)
- Measures used
- Sampling method

- Sample size/ Power
- Statistical significance
- Effect sizes
- Other variables measured/ controlled for
- Key conclusions of the study

Correlational and/or regression data examining associations between the variables of interest i.e., I-C values and depression and/or anxiety symptoms were extracted. Sources of heterogeneity examined were related to study design (e.g., observational vs. RCT designs), quality appraisal / risk of bias ratings, and measures (e.g., different measures of depression / anxiety or core values). Due to the extent of methodological heterogeneity across all eligible studies (e.g., different study designs, measures, analysis methods), a meta-analysis was not viable to pool quantitative results across studies. Therefore, a narrative synthesis was conducted. The rationale for the narrative synthesis was to organise the heterogeneous studies into various domains of types of studies and methodologies i.e., association, and mediator and moderator studies in order to achieve a coherent synthesis. The extracted data was tabulated into tables 2 and 3. This included details of results. The narrative synthesis provided a concise summary of the key findings according to these themes.

Study risk of bias assessment

The quality of the included studies were assessed by the author using the Critical Appraisal Skills Programme checklist (CASP, 2018; Appendix A) for cohort studies. This specific risk of bias framework was chosen because of the advantage of being able to use several CASP checklists that are designed to be relevant to different methodological designs. For example, there is a checklist for cohort studies and there is a checklist for clinical trials. Each CASP checklist formulates a series of questions on different domains of quality appraisal. The reviewer attributed a classification based on whether there is evidence of low, moderate or high risk of bias for each of those domains. The final classification for each of these studies depends on the weight of the indicators of risk of bias. All studies were double-rated by an independent assessor. Any disagreements would be resolved by consulting a third reviewer.

Due to the design of the studies predominantly being cross-sectional surveys, item 6 on the CASP checklist which focuses on following up subjects was not relevant and therefore not completed for the majority of studies. Each study was rated as low, moderate or high risk based on the overall appraisal of all items of the CASP checklist.

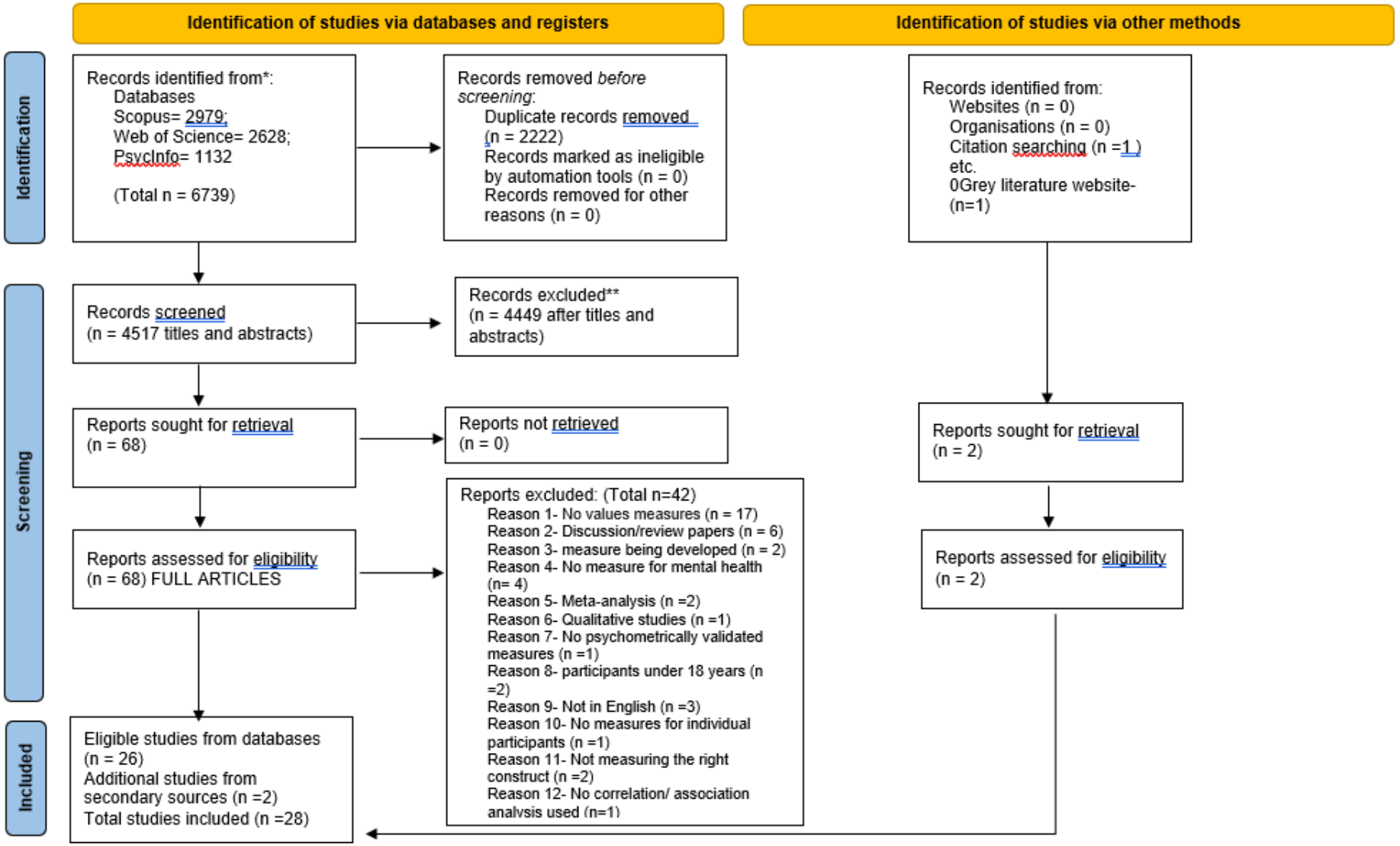
Inter-rater reliability was calculated using Cohen's Kappa (Cohen, 1960). Inter-rater reliability was $\kappa = .868$ ($SE = .129$, $p < .001$) which demonstrated there was almost perfect agreement between both raters. Differences in the ratings of one study was discussed between the two raters in order to agree a final assessment.

RESULTS

Figure 1 outlines the study selection process using a PRISMA diagram (Page et al., 2021). Studies from the databases searched were combined (n=6739) and duplicates removed (n=2222). The titles and abstracts of the remaining articles (n=4517) were then screened and resulted in n=4449 articles being excluded (see Appendix B for reasons for excluding studies). Full text articles (n=68) were retrieved and screened against the eligibility criteria. Overall, 26 eligible articles were identified through the above searches. A subsequent forward and backward search yielded one additional article. A grey literature search (www.proquest.com) further yielded one additional article and therefore 28 studies were included in this review. Information extracted is summarised in Table 2 (study characteristics) and Table 3 (summary of results).

Figure 1

PRISMA 2020 flow diagram for new systematic reviews which included searches of databases, registers and other sources



Study characteristics

An overview of the study characteristics can be seen in Table 2. Most of the studies (n=25) were cross-sectional and the remainder were longitudinal designs (n=3). Of the three studies with longitudinal designs, only one was a psychological intervention study i.e., Kaczkurkin et al., (2022). The studies were conducted in various countries. Eight studies were conducted in the United Stated, four in Australia, two in China, two in Turkey, one in the Philippines, one in Canada, one in Russia, one in Ireland, one in Saudi Arabia, and one in Hong Kong. Six studies were jointly conducted in two countries. These were the United Kingdom and Malaysia (n=2), Australia and Singapore (n=1), Australia and India (n=1), United States and Hawaii (n=1) and Taiwan and the United States (n=1). All studies had sample sizes of >100.

The majority of participants in the studies were female. Only one study included a majority male sample (Du et al., 2015). Kaczkurkin et al., (2022) had one transgender person and three people identifying as 'other' in their sample.

Twenty studies were published in peer reviewed journals. The eight remaining studies were dissertations/ grey literature. Twenty-six studies used non-clinical samples, one study used mixed clinical and non-clinical samples and one study was conducted with a clinical sample. All studies looked at various measures of values and depression and/ or anxiety. The studies were conducted/ published between 1994-2023. Participants in the studies were recruited from universities (n=19), the community (n=7), a clinic (n=1) and an existing physical health database (n=1).

The majority of the studies were cross-sectional surveys. Of the three studies with longitudinal designs, only one was a psychological intervention study i.e., Kaczkurkin et al., (2022). Participants in this study were recruited from an Outpatient speciality clinic and received 10-20 sessions of CBT treatment. Participants in the remaining two studies; completed follow-up questionnaires four (Tafarodi & Smith, 2001), and six and twelve months apart (Du et al., 2016).

TABLE 2.

Study characteristics

Author(s) Year of publication	Country	Design	Source	Sample characteristics (Participants recruited from; clinical/ non-clinical; mean age; gender; mental health problem examined; ethnicity)	Measures of values	Measures of mental health	Other variables measured/ controlled for	Sample size (Recruited/ analysed)	Aims
Akdogan & Çimsir, 2022	Turkey	Cross-sectional survey	Journal publication	University (Non-clinical), Mean age- 21.38, F- 182 M-64 Social anxiety, Turkish	CAS	LSAS IFS	N/a	246	Exploring individual's ambivalence feelings towards collectivistic norms and association with social anxiety
Aruta et al. 2021	Philippines	Cross-sectional survey	Journal publication	University students (Non-clinical) Mean age- 19.56 F- 197 M- 120 Gender unreported- 2	RISCS	PHQ-9 LOSC	N/a	319	Examined the moderating effect of interdependent self-construal on the relationship between internal self-criticism and depression

				Depression					
Bilican et al. 2016	Turkey	Cross-sectional survey	Journal publication	College students (Non-clinical) Mean age- 22.08 F-426 M-262 Gender unreported- 24 Depression Turkish	SVSRTV	BDI, BHS	Spirituality, hopelessness, benevolence,	712	Exploring which values predicted depressive symptoms and hopelessness
Bhullar et al. 2012	Australia, India	Cross-sectional survey	Journal publication	University students (Non-clinical) Mean age- 30.16 F- 74.9% (of 207 participants in Australia) and 65.6% (of 163 participants in India) M- not reported Depression, anxiety Australian, Indian	ICS	DASS SWLSAES	Emotional intelligence, satisfaction with life	370	Examined the associations of cultural orientation with emotional intelligence, mental health, and satisfaction with life

Cepeda 2011	United States	Cross-sectional survey	Grey literature (dissertation)	University students (Non-clinical) Mean age- 22.34 F- 73 M- 59 Depression, PTSD, Filipino Latino European American	CCSR Brief COPE COS	CES-D PCL-C LEQ BSI	N/a	132	Investigated the relationship between negative life events/s tress and mental health and whether they are mediated by the use of collective coping strategies
Du et al. 2015	China	Longitudinal survey (prospective)	Journal publication	Existing database (see below) (Non-clinical) Mean age- 24.11 F- unreported M-376 Depression Chinese The data was derived from a larger intervention study focusing on reducing HIV-risk among young migrants in Beijing, China. HIV-risk intervention program or a control condition. Two follow-	COS	CES-D	N/a	660/641	Examined the longitudinal relationship of collectivistic orientation and depression and the mediating effects of acculturative stress and cultural self-efficacy

				up assessments were conducted at 6 and 12 months post-intervention.					
Hahn 2010	United States	Cross-sectional survey	Grey literature (dissertation)	International university students (Non-clinical) Mean age- unreported F-257 M-254 Asian, European, North American, South American, Middle Eastern, African, Oceania, and Central or Latin American Depression	HVIC	PHQ-9 CISS	Gender, age, visa type, length of stay, religion, geographic location, financial concerns, academic stress, perceived socio-economic status	648/ 511	To explore the relationships among stress, coping, culture and depression.
Ho 1994	United States	Cross-sectional survey	Grey literature (dissertation)	University students (non-clinical) Mean age- 24.5 F-263 M- 178 Depression Chinese (from China, Taiwan, Hong Kong), American Recruited from universities in Beijing, the PRC; Hong Kong;	ICS	SODS	N/a	441	To examine the relationship between self-structure and the presentation of depressive symptomatology

				Taipei, Taiwan; and Chicago, the United States. The volunteer subjects completed the packet of three measures at home or in the case of the Americans, in small groups at school, and returned them to the class instructor					
Hong & Woody 2007	Canada	Cross-sectional survey	Journal publication	Community (non-clinical) F- 358 M- unreported Mean age- Korean (M= 34.6 years), Euro-Canadian (M= 35.2 years) Korean, Euro-Canadian Social anxiety	SCS	SPAI	Identity consistency, self-criticism	505/ 501	Examine relationship between ratings of social anxiety and beliefs and self-views
Humphrey et al. 2020	Australia	Cross-sectional survey	Journal publication	University students (Non-clinical) Mean age- 19.6 F- 384 M- unreported Depression and anxiety	ICS	DASS 21	N/a	507	Investigated how cultural values reflected in the horizontal and vertical dimensions of individualism and collectivism affect the

				Ethnicity- not reported					personal wellbeing
Jeffrey 2020	Unites States	Cross-sectional survey	Grey literature (dissertation)	University students (Non-clinical) Mean age- 20.08 F- 1192 M- not reported Depression Hispanic, African American, East Asian, South Asian, White	ICS	PRS CES-D	N/a	1650	Investigated whether social support, individualism, and collectivism predicted likelihood of depressive
Jobson 2011	Australia	Cross-sectional survey	Journal publication	Community including from organizations that provide treatment for trauma survivors. (Clinical and non-clinical) Participants from individualistic cultures (Australia, New Zealand, Western Europe and North America) with PTSD (N = 25; 6 males; 19 females; mean age = 41.08, and without PTSD (N =29; 6 males; 23 females, mean age = 39.21) Participants from collectivistic (Asia, Africa, Middle East and South America) cultures with PTSD (N = 23; 9 males; 14 females mean age = 34.35 and	TST	PDS THQ HSCL-25	Controlled for lifetime exposure to traumatic events	117/ 101	Investigated cultural differences in levels of autonomous orientation (the tendency to express autonomy and self-determination) in autobiographical remembering in those with and without posttraumatic

				without PTSD (N = 24; 11 males; females 13, mean age = 33.54) PTSD					stress disorder (PTSD
Jobson & O'Kearney 2009	Australia	Cross-sectional survey	Journal publication	Community (Non-clinical) F-74 M= 32 Mean age in years across the 4 groups; Independent culture- 41.15 years (PTSD); 40.16 years (No PTSD); Interdependent culture- 34.25 years (PTSD); 33.24 years (No PTSD) PTSD Australian; New Zealander; Western European; American; Asian, African, Middle Eastern; Russian; South American	TST	PDSTHQ HSCL-25	N/a	106	Investigated the impact of cultural differences in self on negative cognitive appraisals in those with and without PTSD
Kaczkurkin et al. 2022	United States	Longitudinal clinical study	Journal publication	Outpatient specialty anxiety clinic (Clinical)	SCS	SPIN Gad-7 PDSS	N/a	321	Examining whether the relationship between interdependent/

				Mean age- 31.23 F-172 M- 145 Transgender- 1 Other- 3 DSM-5 anxiety or anxiety-related disorder. Some with secondary diagnosis of major depressive disorder. White, Asian, Multiracial, Hispanic, African American, Other Treatment- 10-20 sessions of CBT for their primary diagnosis		PDS-5 OCI-R BDI-II			independent self-construals and SAD is specific to SAD or indicative of a broader relationship with anxiety or depression more generally.
Knyazev et al. 2017	Russia	Cross-sectional design	Journal publication	Data collected 2014-2016 in Novosibirsk, Russia (Non-clinical) Mean age = 22.9 F- 240 M- not reported Depression	SCS	BDI-II NIPIP WBSI RRS	Neuroticism, Psychosocial stress, suppression, rumination,	320	Aimed to test the effect of individual patterns of endorsement of individualist and collectivist attitudes on the association between neuroticism and

				Russian Majority were students (59%) and staff (20%) from Novosibirsk University					depressive symptoms
Lin et al. 2017	Australia, Singapore	Cross-sectional survey	Journal publication	University students (Non-clinical) Australian Mean age- 19.97 F- 100 M- 43 European// Caucasian background, Asian excluding Chinese (e.g., Indian, Japanese, Filipino), Chinese, and Other Ethnicity. Singaporean Mean age- 21.56 years F- 99 M- 47 Chinese, Other Asian (e.g., Indian, Punjabi, Malay), and Mixed Ethnicity (e.g., Eurasian).	ICS	DASS-21 ECR-RS	N/a	289	Investigated how individualism and collectivism may relate to adult attachment orientations (anxiety and avoidance) and whether they moderate the attachment–psychological health link

Lopez 2011	United States	Cross-sectional survey	Grey literature (dissertation)	College students recruited from campus (Non-clinical) Mean age- not reported F- not reported M- not reported African-American, Asian American, Caucasian, Latino, Multiracial	RIC VIA	BDI-II	N/a	482/ 387	Examined associations between individualism, collectivism, acculturation, and depressive symptoms
Msetfi et al. 2015	Ireland	Cross-sectional survey	Journal publication	<u>Experiment 1-</u> University of Limerick in the Republic of Ireland (Non-clinical) Mean age- 22 F- 78 M- 49 white or white Irish, Asian or mixed origins. Depression and bipolar disorder <u>Experiment 2</u> University of Hertfordshire, (non-clinical) Mean age- 25.36	ICS	<u>Experiment 1</u> BDI MDQ <u>Experiment 2</u> Also completed DASS <u>Experiment 3</u> Also completed PANAS	N/a	Experiment 1- 257/ 127 Experiment 2- 636/ 324 Experiment 3- 876/ 272	To use the constructs of individualism and collectivism in order to identify the values held by participants that are relevant to perceived control

				F-202 M- 122 white, Asian, Black, mixed origins, <u>Experiment 3</u> Mean age- 28 years F- 166 M- 106					
Nezlek & Humphrey 2023	United States	Cross-sectional survey	Journal publication	University students (Non-clinical) Mean age- 18.9 F- 1130 M- 776 Wellbeing- Depression, Anxiety 65% White	HVIC	CESD MiniS BFI-44	Self-esteem, interpersonal relationships, and neuroticism	1906	Examined relationships between well-being and individualism and collectivism

Scott et al. 2004	Australia	Cross-sectional survey	Journal publication	First year Australian university students (Non-clinical) Mean age- 21.6 F- 222 M- 54 20 excluded from the main analysis, but gender not disclosed Depression Australian	ICS	BDI-II BHS SRECQ LES HS SSQ GHSQ	Suicide ideation, emotional competence, help seeking	276/ 256	Examining the relationship between idiocentrism and mental health
Senan et al. 2019	Saudi Arabia	Cross-sectional survey	Journal publication	Recruited from a population in Saudi Arabia (Non-clinical) Mean age- not reported. The majority (69%) of participants were aged between 18 and 35 years (n = 298, 18–24, n = 126, 24–35), 90 reported being 35–44 years, 78 reported being 45–54, 18 reported being 55–64, and 4 reported being 65–74. F- 510 M= 104	ICS	BDI MDQ SOCM	Bipolar symptoms	614	Evaluates I-C values both as moderators and mediators between perceived control and mood disturbances may operate.

				Depression Saudi Arabian					
Siu & Chang 2011	Hong Kong	Cross-sectional survey	Journal publication	University students (Non-clinical) Mean age= Unreported (70.2% under the age of 20 years) F= 138 M= 167 Depression, anxiety, Chinese	CCS	DASS-42	N/a	305	Investigated how the effects of stress-related events on psychological distress are mediated through coping strategies
Syn 2014	United States	Cross-sectional survey	Grey literature (dissertation)	Community (Non-clinical) Mean age- East Asian American (M=29 years), European American (M=34 years) F- 84 M- 65 East Asian American, European American Social anxiety	SCS	IMBS SWLS SHS	Modesty, subjective happiness,	149	Aimed to examine the link between social anxiety and functional impairment for those who identify with a collectivistic orientation

Tafarodi & Smith 2001	United Kingdom, Malaysia	Longitudinal study (prospective)	Journal publication	University students (Non-clinical) Mean age- 22.54 (British) 23.13 (Malaysian) F- 21 M-44 Depression Ethnicity- Malaysian, British	INDCOLb	BDI LER	N/a	65/ 63 Gender of two participants eliminated is not disclosed	Exploring cultural differences in sensitivity to social events.
Tang 2013	Taiwan, United States	Cross-sectional survey	Grey literature (dissertation)	University students (Non-clinical) Mean age- 25.22 All female Depression Taiwanese, American	ICIA IDI	CES-D DAS RCSE RCI	N/a	211	Exploring dependent relational identity and depression in the context of romantic relationships across cultures.
Wai et al. 2019	Malaysia, United Kingdom	Cross-sectional survey	Grey literature (dissertation)	University students (Non-clinical) Mean age- 20.6 F- 130, M- 46 Mental wellbeing	CCS	SWEMWBS	N/a	176	To explore the relationship between collective coping styles and mental wellbeing

				Chinese, Malay, Indian, Indigenous/ Orang Asli and other ethnicities (not stated)					
Yoon et al. 2020	United States	Cross-sectional survey	Journal publication	Community (Non-clinical) Mean age- 29.88 F- 166 M- 70 Depression European American, Asian or Pacific Islander, African American, Latino/a, Native American, Multiracial or other	INDCOLa SCS	PBS CES-D PANAS	Gender	236	To examine interrelations among patriarchal beliefs, gender, collectivism/individualism, and mental health
Zhang & Han 2023	China	Cross-sectional survey	Journal publication	University students (Non-clinical) Mean age- 19.73 M- 1012 F= 1758 Depression Chinese	ICS CVS	CES-D SES MSPSS PTM	Self-esteem, subjective social support., pro-social behaviour, utility in pro-social behaviour	3000/ 2770	Examine the individualism and collectivism (I-C) orientation among Chinese college students and explore predictive associations between I-C and other variables.

Assessing Emotions Scale (AES); Beck depression inventory (BDI); Beck Depression Inventory (BDI-II); Beck Hopelessness Scale (BHS); Brief—Coping with Problems Experienced Inventory (Brief COPE); Big Five Inventory (BFI-44); Brief Symptom Inventory (BSI); Collectivistic Ambivalence Scale (CAS); Collectivistic Coping Styles Inventory (CCS); Collectivist Coping Style Inventory Revised (CCSR); Center for Epidemiologic Studies Depression Scale (CES-D); Coping Inventory for Stressful Situations (CISS); Cultural Orientation Scale (COS); Chinese Values Scale (CVS); Depression Anxiety Stress Scales Survey (DASS); Depression Anxiety Stress Scales Survey (DASS-21); Depression- Anxiety-Stress Scale (DASS-42); Dyadic Adjustment Scale (DAS); Experiences in Close Relationships-Relationships Structures scale (ECR- RS); Generalized Anxiety Disorder, 7-item scale (GAD-7); General Help Seeking Questionnaire (GHSQ); Hassles Scale (HS); Hopkins Symptom Checklist (HSCL-25); Horizontal/vertical collectivism/individualism scale (HVIC); Individualism-Collectivism Scale (ICS); Individualism-Collectivism Scale (INDCOLa; Singelis et al., 1995); Individualism–collectivism scale (INDCOLb; Hui, 1988); Inferiority feeling scale (IFS); Integrated Modest Behavior Scale (IMBS); Interpersonal Dependency Inventory (IDI); Interpersonal Assessment Inventory (ICIA); Level of Self-Criticism Scale (LOSC); Liebowitz social anxiety scale (LSAS); Life Events Questionnaire (LEQ); Life events record (LER); Life Experiences Survey (LES); Mini-SPIN, (MiniS); Mood Disorders Questionnaire (MDQ); Multidimensional Scale of Perceived Social Support (MSPSS); Neuroticism- International Personality Items Pool (NIPIP); Obsessive-Compulsive Inventory (OCI-R); Panic Disorder Severity Scale (PDSS); Patient Health Questionnaire (PHQ-9); Patriarchal Beliefs Scale (PBS); Positive Affect Negative Affect Scale (PANAS); Positive Relations Subscale (PRS); Posttraumatic Diagnostic Scale for DSM-5 (PDS-5);

Posttraumatic Stress Diagnostic Scale (PDS); PTSD-Checklist—Civilian Version (PCL-C); Pro-social Tendencies Measure Scale (PTM); Relationship Closeness Inventory (RCI); Relationship-Contingent Self- Esteem (RCSE); Relational, Individual, and Collective Self-Aspects Scale (RIC); Relational Interdependent Self-Construal Scale (RISCS); Ruminative Responses Scale (RRS); Satisfaction with Life Scale (SWLS); Self-Construal Scale (SCS); Self-Esteem Scale (SES); Self-report emotional competence questionnaire (SRECQ); Schwartz Values Survey Revised Turkish Version (SVSRTV); Social Phobia Inventory (SPIN); Social Phobia and Anxiety Inventory (SPAI); Short Warwick-Edinburgh Mental Well-being Scale (SWEMWBS); Social Support Questionnaire (SSQ); Subjective Happiness Scale (SHS); Symptoms of Depression Scale, (SODS); Trauma History Questionnaire (THQ); Twenty Statements Test (TST); Vancouver Index of Acculturation (VIA); White Bear Suppression Inventory (WBSI).

Risk of bias assessment

Risk of bias for studies included in the review can be found in the Supplementary File (Appendix C). The risk of bias found no low risk studies, 23 studies of moderate risk, four high risk studies and one where the reviewers disagreed upon the ratings between moderate-high risk. The most common sources of bias across the reviewed studies were: there were no follow-ups for the majority of studies due to the majority of studies being cross-sectional surveys, the lack of generalisability to other populations as most of the studies recruited university students and used non-clinical samples, lack of identification of confounding variables, and the results not always fitting with previous evidence leading to a need in further research. No power analyses were completed for any studies which also contributed to the bias across the studies.

TABLE 3.

Summary of results

Author(s) Year of publication	Focus (Association; Moderation; Mediation)	Statistical analysis method	Summary of results	Conclusion
Akdogan & Çimsir, **(2022)**	**Med**	SPSS PROCESS macro, developed by Hayes (2013).	Collectivistic ambivalence and social anxiety is significant (c = 0.34; p < .001). This becomes nonsignificant (i.e., c' = 0.11, p = .0783) when the inferiority feeling is introduced into the analysis indicating a full mediation effect.	There is a full mediation effect of inferiority feelings in the relationship between collectivistic ambivalence and social anxiety.
Aruta et al. **(2021)**	**Mod**	Regression analysis	Internal self-criticism (ß = .21, SE = .04, p < .001, CI = .125, .285) was associated with depression. interdependent self-construal moderated the relationship between internal self-criticism and depression (ß = .14, SE = .05, p < .01, CI = .051, .231). This association was stronger when the levels of interdependent self-construal were low (ß = .30, SE = .05, p < .001, CI = .1968, .4042), and significant but weaker when the levels of interdependent self-construal were high (ß = .11, SE = .05, p < .05, CI = .0153, .2067).	Interdependent self-construal moderated the influence of internal self-criticism on depression and showed that the influence of self-criticism on depression was weaker among individuals with high levels of interdependent self-construal.
Bilican et al. **(2016)**	**A**	Hierarchical Multiple Regression	On the values subscale, Universalism was negatively correlated with depression (β = -.14; p = .00, t= -3.17**)	Universal values reduce depression
Bhullar et al. **(2012)**	**Mod**	Hierarchical Multiple Regression	Collectivism was significantly associated with lower levels of depression, F(7, 362) = 10.22, ǻR2 = .02, β = -.37, SE = .12, p < .01, and anxiety, F(7, 362) = 16.08, ǻR2 = .02, β = -.28, SE = .11, p < .05 for individuals residing in India	A significant moderation effect for the country of origin was found only for depression and anxiety in the Indian sample. Collectivism was negatively associated with depression and anxiety.
Cepeda **(2011)**	**Med**	Structural Equation Model	**Model with Collectivistic Coping Use as Mediator**	There is no support for coping strategies mediating the association between stress and mental health**.**

			Mental health was not associated with overall life stress (P = 0.00; t = 1.47, p > .05). Social and Reframing Coping as mediator in European-Americans and Latinos was not significant (z = -0.06, p = .95; z = -0.24, p= .81) Self-Focused Coping as a mediator was not significant (z = 1.76, p = .08). **Model with Mainstream Coping Use as Mediator** There was a significant association between mental health and overall life stress (β = 0.00; t= 2.23, p < .05). Approach Coping as a mediator in European-Americans and Latinos was not significant (z = -1.80, p = .07; z = -1.04, p = .30) Avoidant Coping as a mediator was not significant (z = 0.0, p = 1). **Cultural orientation as a mediator** Vertical individualism and depression (β= .067, p= .034*),	
Du et al. **(2015)**	**Med**	Structural equation modelling	Collectivistic orientation is negatively associated with depression (-.28***, p< .001). There is a significant mediating effect of acculturative stress and cultural self-efficacy in the relationship between collectivistic orientation and depression (b = -.08, p <.001; b = -.30, p<.001).	Both acculturative stress and cultural self-efficacy were found to be mediators between collectivistic orientation and depression
Hahn **(2010)**	**Med and Mod**	MANOVA Hierarchical Multiple Regression	Cultural Stress (t = 10.078, p <.001) is significantly associated with depression. Horizontal Individualism is not correlated with depression (.040). Vertical Individualism is positively (.156**, p<.001) correlated with depression. Horizontal Collectivism (-.103*, p<.05) is negatively associated with depression. Vertical Collectivism is positively (.087*, p<.05) correlated with depression. **Cultural orientation as mediator** Only Vertical individualism and depression was significantly associated between cultural stress and depression (β= .067, p= .034*)	Only Vertical Individualism was a significant moderator and mediator between acculturative stress and depression

			Cultural orientation as moderator Vertical Individualism (B= .013, p= .003) was found to significantly moderate the relationships between both acculturative stress and depression.	
Ho **(1994)**	**A**	ANOVA	No significant difference between the individuals with collectivist (M= 10.314) and individualist (M= 10.864) self-structures and SODS. (d=1, MS= 33.425, F=.962, P= .3272)	Depressive symptoms along the five subscales is not related to individualistic or collectivist self-structure.
Hong & Woody, (2007)	**Med**	Mediation models	Independent and interdependent self-construal are significantly associated with social anxiety after controlling for ethnicity-(b= -1.71, p<.001; b= 0.56, p<.003) The Sobel test showed interdependent self-construal to be a significant partial mediator, b= - 1.05, s= 0.40, -1.94<95% CI< -0.26, Z= -2.59, p<0.01 the between ethnicity and social anxiety.	Independent self-construal fully mediates ethnic differences in social anxiety
Humphrey et al. **(2020)**	**A**	Multiple regression	Vertical individualism was associated with lowering psychological wellbeing (β = .160, t(506) = 3.46, p = .001) and horizontal collectivism was associated with higher psychological wellbeing (β = −.149, t(506) = −2.94, p = .003.	Vertical individualism negatively impacts young people's wellbeing (Depression Anxiety Stress Scales Survey) Horizontal collectivism positively impacts young people's wellbeing
Jeffrey **(2020)**	**A**	Multiple regression analysis	Individualism was significantly associated with increasing depression (β = .07, p < .05). Collectivism was not significantly associated with depression (β = .003, p = .908)	Individualism was significantly positively associated with depression.
Jobson **(2011)**	**A**	ANOVA	The interaction between culture and PTSD status was significant, F (1, 97) = 12.12, p < .01. For individualistic culture, those with PTSD had significantly less autonomous orientation in their autobiographical memories than those without PTSD, t (53) = 2.84, p < .01, CI.95 = 4.87, -.83, d = .79. For collectivistic culture, those with PTSD had significantly more autonomous orientation in their autobiographical memories than those without PTSD, t (44) = 2.25, p= .03, CI.95 = .16, 3.01, d = .66	People deviating from their own cultural values in terms of autonomous orientation in autobiographical remembering are more vulnerable to developing PTSD.

Jobson & O'Kearney **(2009)**	**Mod**	ANCOVA	Independent PTSD had significantly greater mental defeat than independent without PTSD, t (55) = 5.15, p < .01, CI.95 = .74, 1.69, d = 1.37. Interdependent PTSD did not differ significantly from interdependent no PTSD, t (47) = .70, p = .49, CI.95 = −.71, .34, d = .20. Independent PTSD had significantly fewer control strategies than independent without PTSD, t (55) = 4.52, p < .01, CI.95 = −1.60, −.63, d = 1.22. However, interdependent PTSD did not differ significantly from interdependent no PTSD, t (47) = .91, p = .37, CI.95 = −.36, .96, d = .26 Independent PTSD had significantly greater permanent change than independent without PTSD, t (55) = 7.37, p < .01, CI.95 = 1.30, 2.26, d = 1.91. Furthermore, interdependent PTSD did not differ significantly from interdependent no PTSD, t (47) = 1.38, p = .17, CI.95 = −.18, .95, d = .39.	Cultural variation in self, moderated the relationships between cognitive variables and PTSD. Those from independent cultures with PTSD had significantly more appraisals of mental defeat and permanent change and tended to have less appraisals of control than those from interdependent cultures with PTSD.
Kaczkurkin et al. **(2022)**	**A**	IBM SPSS Statistics- Correlations Canonical correlation analysis (CCA)	Interdependent self-construal and SPIN .18** (p<0.01) Independent self-construal and SPIN -.40*** (p<0.001)	Interdependent self-construal was positively associated with social anxiety symptoms. Independent self-construal was negatively associated with social anxiety symptoms.
Knyazev et al. **(2017)**	**Med**	Structural equation modelling (SEM)	The effect of neuroticism on BDI is significant without mediator (β = 0.42, p < 0.001) in the low individualism group only. This is no longer significant when the mediator is included in the model (β = 0.15, p = 0.157).	Maladaptive emotion regulation fully mediated the effect of neuroticism on depression in low individualism scorers.
Lin et al. **(2017)**	**Mod**	Multiple regression analyses	Collectivism was a significant moderator between Attachment Anxiety and Negative Emotional State, (R2 = .03, F(3, 281) = 3.48, p < .05).	Attachment anxiety is a predictor of worse negative symptoms amongst individuals higher in collectivism across cultures. I-C values do not moderate the relationship between avoidance and negative symptoms
Lopez **(2011)**	**A**	Hierarchical multiple regression	Overall depressive symptoms- Individualism (β= -.05), Relational Collectivism (β= .06), Group Collectivism (β= -.17*, p<.05)	Overall I-C values were not significant predictors of depression, however group collectivism was significantly associated with overall depressive symptoms.

Msetfi et al. **(2015)**	**Med**	Median splits non-parametric bootstrapping procedure	The direct relationship between perceived control and BDI scores was not reliable, β = 0.01, p = 0.66, however, the indirect pathway through HC scores was reliable (β = −0.008 [−0.03, −0.001]).	High collectivist values fully mediated the association between perceived control and depression.
Nezlek & Humphrey **(2023)**	**A**	Multiple regression	Individualistic Horizontal- CESD- .037; Mini-Spin- .091 (p < .001) Individualistic Vertical- CESD- .078 (p < .001); Mini-Spin- -.017 Collectivistic Horizontal- CESD- -.220 (p < .001); Mini-Spin- - .154 (p < .001) Collectivistic Vertical- CESD- -.082 (p < .01); Mini-Spin- .025	Collectivist subscales were positively related to wellbeing (depression and anxiety), vertical subscales were negatively related to wellbeing (CESD and Mini-SPIN) Vertical individualism was negatively related to well-being as measured by depression (the CESD) Horizontal individualism was negatively related to wellbeing as measured by the Mini-SPIN (anxiety). Horizontal collectivism was positively related to wellbeing as measured by depression i.e., negative coefficients for the CESD and Mini-SPIN (anxiety). Vertical collectivism was positively related to wellbeing as measured by depression i.e., negative coefficients for the CESD.
Scott et al. **(2004)**	**Mod**	Correlation analyses General linear model (GLM) univariate regression analyses.	Idiocentrism unrelated to depression (.00) Social support did not significantly moderate the interaction between idiocentrism and depression (all F 54.3, all p 4.039).	Idiocentrism is not related to depression. *social support* is not a moderator between idiocentrism and mental health.
Senan et al. **(2019)**	**Med**	PROCESS for SPSS	Horizontal collectivism has a mediation effect on the relationship between perceived control and lower levels of Depression (β = -.02* [-.04, -.004]).	High levels of control were linked to lower symptom levels. This was further mediated by horizontal collectivism.

Siu & Chang (2011)	**Med**	Structural equation model	Coping strategies as mediators Family support- depressive symptoms- (b= -.08, p<.05) Religion/ spirituality- anxiety symptoms- (b= -.06, p<.05) Private emotion outlet- depressive symptoms- (b=.27, p<.05)	The effects of stress-related events on psychological distress were direct. The mediating effects of coping strategies was weak (based on the total sum of the strategies)
Syn (2014)	**A**	Pearson correlations	Interdependent self-construal had a small but significant positive relationship with social anxiety (r = .181; p = .027). Independent self-construal had a moderately negative relationship with social anxiety (r = -3.29; p = .000)	Higher interdependence self-construal is associated with higher social anxiety. Higher independence self-construal is associated with lower social anxiety
Tafarodi & Smith (2001)	**Med**	Multiple regression	Positive events are negatively associated with depression for Malaysians, but not Britons (B= -0.30; p = 0.02: B= 0.06; p = 0.65). Negative events are positively associated with depression for Malaysians, but not Britons (B= 0.35; p < 0.02; B= -0.04; p = 0:76) Positive achievement was negatively associated depression in the British group only (B = -0.29; p = 0.03).	Positive events reduced depression and negative events increased depression over a four-month interval for Malaysians only. Positive achievement events reduced depression for British students only
Tang (2013)	**A**	Correlational, regression,	Depression was significantly negatively associated with collectivistic values on the ICIA social harmony towards friends subscale (r(85)= -.23, p<.05) and collectivistic behaviours on the ICIA social harmony towards colleagues subscale (r(85)= -.22, p<.05). Overall regression analysis- negative correlations between depression was negatively associated with interpersonal dependency on the IDI (r=-.42, p=.00).	Depression is significantly negatively associated with collective subscales of harmony towards friends and colleagues in US women only. Interpersonal dependency was found to be significantly negatively associated with depression.
Wai et al. (2019)	**A**	Multiple linear regression	Significant regression equation between the CCS subscale and depressive symptoms, (F (5,170)= 5.705, p<.001) ARS- significantly associated with mental well-being (β=.21, p<.05) FS- significantly associated with mental well-being (β=.19, p<.05) PEO- significantly associated with mental well-being (β=.23, p<.01) RS- (religion/ Spirituality)- was not significantly associated with mental well-being (β= -.12)	Collective coping subscales of acceptance, reframing and striving (ARS), family support (FS), and Private emotional outlet (PEO) were positively associated with wellbeing.

			AD- (Avoidance and Detachment)- was not significantly associated with mental well-being (β= -.12)	
Yoon et al. (2020)	**Mod**	Hierarchical multiple regression	Interaction between patriarchal beliefs and vertical collectivism significantly associated with depression, but only at low levels of vertical collectivism (t (236) = 2.66, p < .01) and not high levels (t (236) = – .10, p > .05).	Patriarchal beliefs were positively associated with depression at low levels of vertical collectivism and not high levels.
Zhang & Han (2023)	**A**	Bivariate, and multiple regressions	Bivariate High individualism was positively correlated with strong depression (.15, p<.001) High collectivism was negatively correlated with depression (-.12, p<.001) Multiple regression- The R2 is higher in the collectivism model than in the individualism model (0.11 > 0.05).	High collectivism is negatively correlated with depression, whereas high individualism is negatively correlated with depression

Beck depression inventory (BDI); Center for Epidemiologic Studies Depression Scale (CES-D); Collectivistic Coping Styles Inventory (CCS); The Individualism-Collectivism Interpersonal Inventory (ICIA); Interpersonal Dependency Inventory (IDI); Mini-SPIN (MiniS); Post-traumatic Stress Disorder (PTSD); Social Phobia Inventory (SPIN); Scale of Depressive Symptoms (SODS);

1. Association studies

1.1. Associations at scale level

Six studies looked at the association between I-C values and mental health. One study (Jobson, 2011) looked at the association between values and Post-traumatic Stress Disorder (PTSD) and found there were no group differences in terms of PTSD between the individualistic or collectivist cultures. The study found individuals who deviated from their own cultural norms of autonomous orientation in autobiographical memories may be more vulnerable to developing PTSD.

Two studies (Kaczkurkin et al., 2022; Syn, 2014) looked at the association between I-C values and social anxiety. Both studies found interdependent self-construal was significantly associated with higher levels of social anxiety.

Three studies (Jeffrey, 2020; Lopez, 2011; Zhang & Han, 2023) looked at the association between I-C values and depression with mixed findings. Jeffrey (2020) found high individualism was negatively associated with depression but did not find an association between collectivism and depression. Lopez (2011) found neither individualism nor collectivism were significantly associated with overall depressive symptoms. Zhang & Han (2023) found high individualism was positively correlated with strong depression and negatively correlated with social support, and high collectivism was positively correlated with social support and negatively correlated with depression.

Overall, two studies (Jeffrey, 2020; Zhang & Han (2023) associated individualism with poorer mental health outcomes (depression). Two studies (Kaczkurkin et al., 2022; Syn, 2014) found collectivism associated with poorer mental health outcomes (social anxiety). Two studies did not find any or any clear

association between I-C values and mental health i.e., depression (Jobson, 2011; Lopez, 2011). In summary, the evidence of scale-level associations was mixed and inconclusive.

1.2- Associations at subscale level

1.2.1. Value subscales

Six studies (Bilican et al., 2016; Humphrey, Bliuc & Molenberghs, 2020; Ho 1994; Nezlek & Humphrey, 2023; Tang 2013; Wai et al., 2019) examined value subscales and their potential associations with mental health measures.

One study (Bilican et al., 2016) found that only universalism (i.e., having both I-C values) significantly associated with lower depression severity. It found the subscale of achievement increased depression, but this was not statistically significant.

Two studies (Humphrey et al., 2020; Nezlek & Humphrey, 2023), used value subscales of VI, HI, VC and HC. Humphrey et al., (2020) found VI was significantly associated with poorer psychological wellbeing amongst young people (overall score on DASS21), whereas HC was significantly associated with improved psychological wellbeing.

Nezlek & Humphrey, (2023), found individualism was significantly associated with negative wellbeing, although only VI was significantly negatively associated to depression i.e., increased depression. HI was significantly associated with social anxiety, but not depression. Both VC and HC were significantly positively associated

with depression, but only HC was significantly associated with an increase in social anxiety.

Tang (2013) found no overall differences on the total ICIA value scale between the Taiwanese and US group in the correlational analysis. However, they found high levels of interpersonal dependency were significantly associated with lower levels of depression in US women in terms of having lower levels of collectivist values of social harmony. No significant associations were found between interpersonal dependency and depression for Taiwanese women. Depression was significantly negatively associated with some of the collectivism subscales. These were harmony towards friends (collectivist value subscale) and social harmony towards colleagues subscale (collectivist behaviour subscale). Regression analysis found Interpersonal Dependency Inventory scores (IDI) scores were significantly negatively associated with depression for both the Taiwanese and US group.

One study (Wai et al., 2019) found significant positive associations between some collective coping styles (CCS) subscales and depression. These were Family Support (FS), Private Emotional Outlets (PEO) and Acceptance, Reframing and Striving (ARS). Religions/ spirituality (RS) and Avoidance and Detachment (AD) reduced wellbeing.

1.2.2. Mental health subscales

One study used mental health sub-scales. Ho, (1994), found individualistic or collectivist self-structures were not significantly related to depression overall nor across the five depressive subscales (Affective; Existential; Somatic; Cognitive; Interpersonal).

To summarise, studies at values and mental health subscale levels found that universal values (Bilican et al., 2016), VC (Nezlek & Humphrey, 2023) and HC (Humphrey et al., (2020) were associated with improved (e.g., lower) depression severity. VI (Nezlek & Humphrey, 2023) and interpersonal dependency were associated with increased depression severity (Humphrey et al., 2020; Tang, 2013). Additionally, collective coping styles subscales of Family Support (FS), Private Emotional Outlets (PEO) and Acceptance, Reframing and Striving (ARS), Religions/ spirituality (RS) and Avoidance and Detachment (AD) were found to have a significant positive association with improved mental wellbeing (Wai et al., 2019). Collective subscales of harmony towards friends and harmony towards colleagues reduced depression (Tang, 2013). HI and HC significantly increased social anxiety (Nezlek & Humphrey, 2023). Only one study did not find any association between values and depression (Ho, 1994).

2. Studies examining moderator/ mediator hypotheses

2.1. Moderators

2.1.1. Values as moderators

Five studies examined values as moderators and impact on mental health (Aruta et al., 2021; Hahn, 2010; Jobson & Kearney, 2009; Lin et al., 2017; Yoon et al., 2020).

Aruta et al., (2021) explored the moderating effect of interdependent self-construal on depression and found that although interdependent self-construal was not associated with depression, it did significantly moderate the relationship between

self-criticism and depression in that those with higher levels of interdependent self-construal had weaker depression.

Hahn, (2010) completed both moderation and mediation analysis. The mediation analysis will be discussed in the relevant section. Hahn, (2010) found that whilst all culture subscales, except HI were significantly correlated with depression, only VI significantly positively moderated the relationship between acculturative stress and depression.

One study (Jobson & O'Kearney, 2009) examined the role of I-C values in moderating the role between PTSD and four subscales of cognitive appraisals. They found no significant cultural differences between cultural factors and PTSD scores. However, in their moderation analysis they found those from independent cultures had significantly more appraisals of mental defeat and permanent change. There were no cultural differences in I-C values of independent or interdependent and the subscales of control strategies and alienation.

Lin et al., (2017) examined the role of I-C values in moderating the role between adult attachment orientations of anxiety and avoidance and negative emotional state (combined depression, anxiety and stress on the DASS-21). They found adult attachment orientations, in particular attachment anxiety significantly moderated negative emotional state. They found I-C values did not moderate the relationship between avoidance and negative emotional state, however collectivism was a significant moderator between attachment anxiety and worse negative emotional state. Individualism significantly moderated the relationship between Anxiety and psychological symptoms among Singaporeans but not Australians.

Yoon et al., (2020) explored the role of I-C values as moderators between patriarchal beliefs and depression. They found patriarchal beliefs had a significant effect on depression. In their moderation analysis, they found patriarchal beliefs had a significant positive relationship with depression at low levels of VC but not high levels of VC. HI, VI and HC did not significantly impact on depression.

2.1.2- Mental health variables as moderators

The search did not identify any studies where mental health variables were moderators.

2.1.3- Other variables as moderators

Two studies (Bhullar et al., 2012; Scott et al., 2004) used variables other than I-C values and mental health outcomes as moderators (Scott et al., 2004). Bhullar et al., (2012) found a significant moderation effect for country of origin on depression and anxiety for the Indian sample, but not the Australian sample in terms of collectivism being negatively associated with depression and anxiety. Scott et al., (2004) found idiocentrism was unrelated to depression (even after controlling for social support) and social support did not significantly moderate the relationship between idiocentrism and mental heath (hopelessness, depression and suicide ideation).

To summarise studies exploring the impact of moderators in terms of I-C values and other mental health variables examined various moderators.

In one study, interdependent self-construal improved depression (Aruta et al., 2021), in two studies HC and VC had significant positive associations with negative emotional state (Lin et al., (2017) and depression (Yoon et al., 2020) and one study found independent cultures scored higher in some subscales of coping strategies (Jobson & O'Kearney, 2009) in their presentation of PTSD. One study found country of origin (i.e., India) to have a moderation effect on an Indian sample (Bhullar et al., 2012) and social support was found not to be a moderator (Scott et al., 2004).

2.2- Mediators

2.2.1- Values as mediators

Six studies exploring values as mediators yielded mixed results.

Two studies did not find values as mediators influencing mental health outcomes (Cepeda, 2011; Hong & Woody, 2007). Cepeda, (2011) found neither collectivist nor mainstream strategies mediated the relationship between stress and mental health (i.e., depression and PTSD symptoms).

Two studies found independent values as mediators (Hahn, 2010; Hong & Woody, 2007). Hahn, (2010) found only VI positively mediated the relationship between acculturative stress and depression. Hong & Woody (2007) found independent self- construal fully mediated the ethnic differences in social anxiety, whereas interdependent self-construal partially mediated this effect.

Two studies found values mediating the relationship between perceived control and depression (Msetfi et al., 2015; Senan et al., 2019). Msetfi et al., (2015) found high collectivist values fully mediated the association between perceived control and depression and reduced depression. Similarly, Senan et al., (2019)

found high levels of perceived control mediated lower levels of depression, however HC further added to this effect.

Siu & Chang, (2011) found the mediation effect of coping strategies (as measured by the Collectivist Coping Style Inventory) between stress related events and psychological distress was weak. They found mediating effects of some coping strategies e.g., family support and depression, and religion/ spirituality and anxiety, and a positive mediating effect between private emotion outlet and depression, anxiety and stress.

2.2.2- Mental health variables as mediators

The search did not identify any studies where mental health variables were mediators.

2.2.3- Other variables as mediators

Four studies used variables other than I-C values and mental health outcomes as mediators (Akdogan & Çimsir, 2022; Du et al., 2015; Knyazev et al., 2017; Tafarodi & Smith, 2001).

Akdogan & Çimsir, (2022) found a full mediation effect of inferiority feelings between collectivist ambivalence and social anxiety. Du et al., (2015) found acculturative stress and cultural self-efficacy were mediators between collectivistic orientation and depression. Knyazev et al., (2017) found Maladaptive emotion regulation fully mediated the effect of neuroticism on depression in low individualism scorers. Tafarodi & Smith, (2001) explored sensitivity to life as a mediator and found positive social events were negatively related to depression and negative events

positively related to depression, but only in the Malay group. They also found positive achievement positively associated with depression for only the British group.

To summarise, two studies found no mediating effects of values impacting mental health outcomes (Cepeda, 2011; Hong & Woody, 2007), two studies found mediating effects of collectivism on depression- one fully mediated the effect (Msetfi et al., 2015) and one contributed to lowering levels of depression (Senan et al., 2019). Two studies found individualism as positively mediating the effect between depression (Hahn, 2010) and social anxiety (Hong & Woody, 2007). Finally, one study found a weak mediation effect of coping styles (Siu & Chang, 2011).

Four studies found various variables mediated the role between I-C values and mental health. These variables were inferiority feelings (Akdogan & Çimsir, (2022), acculturative stress and cultural self-efficacy (Du et al., 2015), maladaptive emotion regulation (Knyazev et al., 2017) and some aspects of life events i.e., positive events, negative events and positive achievement mediated the relationship between I-C values and mental health (Tafarodi & Smith, (2001).

Overall, five studies found individualism at scale or subscale level, or as moderators or mediators increased depression or social anxiety (Hahn, 2010; Humphrey et al., 2020; Jeffrey, 2020; Nezlek & Humphrey, 2023; Zhang & Han, 2023). No studies found individualism to decrease psychological distress.

Four studies found collectivism at scale or subscale level, or as moderators or mediators increased depression and social anxiety (Kaczkurkin et al., 2022; Nezlek & Humphrey, 2023; Syn, 2014; Tang (2013). Nine studies found collectivism at scale or subscale level, or as moderators or mediators reduced psychological distress (Aruta et al., 2021; Humphrey, Bliuc & Molenberghs, 2020; Lin et al., 2017;

Msetfi et al., 2015; Nezlek & Humphrey, 2023; Senan et al., 2019; Siu and Chang, 2011; Wai et al., 2019; Yoon et al., 2020).

Six studies did not find any associations between I-C values of individual or collectivism and mental health at scale or subscale level, or as moderators or mediators (Cepeda, 2011; Ho 1994; Hong & Woody, 2007; Jobson, 2011; Jobson & Kearney, 2009; Lopez, 2011).

Six studies found examined variables other than values and mental health as moderators or mediators between the two. Five of them reduced depression (Akdogan & Çimsir, 2022; Du et al., 2015; Knyazev et al., 2017; Tafarodi & Smith, 2001; Bhullar et al., 2012) and one study did not find the variable moderated or mediated psychological distress (Scott et al., 2004).

One study found the variable of universalism (i.e., both individualism and collectivism) to reduce depression (Bilican et al., 2016).

DISCUSSION

This systematic review explored the associations between I-C core values and symptoms of anxiety or depression. A total of 28 studies examining associations at scale level, subscale level, and moderator and mediator studies were included in this review.

It is clear from the comprehensive examination of the literature review there are no universal patterns of association between specific values and mental health. However, the review revealed there are specific influences of collectivist values on different problems. These will be discussed here in light of the broader literature.

Depression

The findings of this review revealed collectivism alleviates depression (regardless of whether the studies were conducted in Western or non-Western countries), but not social anxiety.

Social support seems to act as a protective factor against depression in some studies. For example, Zhang and Han (2023) found high collectivism was positively correlated with social support and negatively correlated with depression. However, Scott et al., (2004) did not find social support moderated the relationship between idiocentrism and mental health. Both of these studies were assessed to be of moderate risk of bias and neither were generalisable to the local population. In another study not included in this review, Meltzer et al., (2013) found a strong correlation between loneliness and depression, but increasing social support was less beneficial than targeting maladaptive social cognitions. Although the sample size Meltzer et al., (2013) used was large (n= 7,461), they included a variety of disorders e.g., psychosis, personality disorder, substance misuse and dependence and did not consider I-C values in their research. Therefore, the evidence for social support mitigating against depression seems to be inconclusive.

Social anxiety

The data revealed a strong collectivist leaning exacerbated social anxiety. All studies were conducted in white western countries. Social anxiety is characterised by a persistent fear of being humiliated or scrutinised by others (World Health Organization 1992; American Psychiatric Association 2013). The review

found HC and HI increased social anxiety (Nezlek & Humphrey, 2023). HC is where individuals view themselves as part of a collective and perceive all the members of that collective as equal (Singelis et al., 1995; Li & Aksoy, 2007). HI is where individuals view themselves as fully autonomous, but as equals (Singelis et al., 1995; Li & Aksoy, 2007). This review also found interdependent self-construal was positively associated with social anxiety (Hong and Woody, 2007; Kaczkurkin et al., 2022; Syn, 2014). For those with collectivist values, social anxiety could be heightened in majority individualistic cultures due to their values conflicting e.g., the need to feel socially connected and emphasis on group harmony versus individualistic culture having emphasis on individual achievement and success (Hoffman et al., 2010). All of these studies carried a moderate risk of bias. All but one study used non-clinical samples.

Akdogan & Çimsir, (2022) found a full mediation effect of inferiority feelings between collectivist ambivalence and social anxiety indicating individuals with increased collectivist ambivalence are more likely to experience social anxiety because they are more likely to struggle with inferiority feelings. Again, this finding seems to indicate leaning away from collectivism exacerbates social anxiety. However, the results of this study are not generalisable as the study was conducted with a non-clinical sample of university students in Turkey.

Contrary to these findings, Hoffman et al., (2010) in their review on literature exploring cultural difference in social anxiety concluded Asian cultures had lower rates of social anxiety and Russian and US samples had the highest rates of social anxiety. Russia is perceived to be a collectivist country.

The mixed findings in this review suggest that collectivistic values do not fully explain differences in social anxiety across cultures. This has been found in previous research also (Arrindell et al., 2005; Schreier et al., 2010).

Post-traumatic stress disorder (PTSD)

This review found those who deviated from their cultural norms were more likely to develop PTSD i.e., a strong individualistic now living in a collective society and vice versa. This finding needs to be treated with caution as the evidence is from one study (Jobson, 2011), which used both clinical and non-clinical samples. One of the studies (Jobson & O'Kearney, 2009) included in this review found cultural variations in self, moderated the relationship between cognitive values and PTSD. They found those from independent cultures with PTSD had significantly more appraisals of mental defeat and permanent change and tended to have less appraisals of control than those from interdependent cultures with PTSD. Mental defeat is the perception of losing all autonomy and identity (Resick, 2001). This can have implications for treatment offered.

Cognitive processing therapy (CPT) was created by Resick & Schnicke (1993) based on the assumption that certain posttraumatic cognitions maintain PTSD symptoms. These are over-accommodation and over assimilation (Resick, 2001). According to Resick, (2001), if new information is not congruent with prior beliefs about the self and the world then the individual's belief systems need to be altered to accommodate this new information to process the trauma. The difficulty arises when people distort the safety and trustability of others or are overly harsh about themselves which leads to overaccommodation (overgeneralisation).

The other difficulty is when over-avoidance of difficult emotions associated with the trauma prevent new information from being accommodated and this leads to people distorting the trauma to keep beliefs intact (Resick, 2001). This is known as assimilation (Resick & Schnicke (1993). If there are cultural differences in how PTSD is developed and maintained, then this needs to be taken into consideration for any treatment. Heim et al., (2022), stated there could be cultural variations in PTSD, however further research is required due to their results being inconclusive.

Limitations of the review

One of the main limitations of this review is that the majority of the studies are cross-sectional surveys and not intervention studies to examine the ongoing impact of core cultural values i.e., I-C values on mental health. Common sources of bias included the lack of generalisability to other populations as most of the studies recruited university students and used non-clinical samples, lack of identification of confounding variables, and the results not always fitting with previous evidence leading to a need for further research.

The findings of this review provide a mixed picture and therefore need to be treated with caution.

One of the main limitations of the studies is the heterogeneity of the samples and results, making it difficult to extrapolate and generalise the findings. It is worth noting that some of the studies were dated and this appears to be an area that requires further research. The majority of the studies recruited university students and therefore only a subsection of society is represented in the majority of studies.

One of the limitations of the review is that given the high degree of methodological heterogeneity across these studies in terms of different designs and methodologies, pooling these into a metanalysis was not viable. One advantage of a meta-analytic methods is that it enables you to examine the potential evidence for publication bias. In this case, these types of publication bias tests could not be performed, therefore we cannot be sure if the included studies may be affected by publication bias. To mitigate against this, thorough searches were conducted over multiple databases and included grey literature.

Implications for clinical practice

Core beliefs are conceptualised to be rigid global ideas about the self, others and the world and are often not expressed and are not as malleable as automatic thoughts and intermediate beliefs (rules, attitudes and assumptions: Beck, 2011). Core values have a cultural dimension as they are accompanied by cultural core beliefs (Han, 2022). According to the cognitive behaviour theory, core beliefs are imperative in the development and maintenance of psychological distress (Beck, 2011). Core beliefs are likely to have a cultural element, therefore it is plausible to assume they are values, and a mismatch of core beliefs between the therapist and patient as described by Williams et al., (2011; 2014) could lead to “cultural ruptures” and microaggressions which can impact on therapy outcomes.

Adapting treatment

The findings of this review and broader research have implications for cultural adaptations of therapy. Several meta-analyses have shown cultural

adaptations produce better outcomes (Anik et al., 2021; Benish et al., 2011; Hall et al., 2016; Soto et al., 2018).

Bhugra, (2021) has written about how culture defines the way we eat, dress, behave and the fact it defines our world view. If clinicians are not exploring patient's world views and taking them into consideration, they may not be providing patients with culturally sensitive care and this could be contributing to the poor recovery rates. Naz et al., (2019) have tried to address this issue by encouraging psychological therapies professionals to explore issues of race, ethnicity and culture and to help them to develop their confidence in delivering culturally sensitive care.

It is important to understand the I-C values patients identify with, otherwise, you are imposing treatments on people that are not in their best interest (Bernal & Adams, 2017). According to Mir at al., (2015) therapists delivering culturally adapted therapies may not understand the client's I-C values and therefore affect therapists' confidence in delivering culturally-adapted therapy.

Soto et al., (2018) in their meta-analysis found therapists-rated cultural competence did not correlate with treatment outcomes, but the client-ratings of therapists' cultural competence did correlate with treatment outcomes. They also found the more cultural adaptations reported in the studies they reviewed, the better the outcomes. Specific adaptions produced larger effect sizes e.g., delivering treatment and providing assessments written in the client's preferred language, setting goals based upon client's I-C values, using cultural metaphors, performing cultural rituals and consulting family members (Soto et al., 2018). Soto et al., (2018) recommend therapists should actively seek to learn about client's perspectives to

bridge the gap between their own self-evaluations and clinicians. If I-C values are as deeply held as core beliefs, it is therefore understandable as to why I-C values must be an important aspect of establishing rapport with patients, especially to prevent "cultural ruptures" as described by Owen et al., (2014).

Disorder specific adaptations

There is increasing evidence that culturally adapted psychotherapies produced better outcomes for depression for minority communities (Chowdhary et al., 2014; Hall et al., 2016). In their systematic review and meta-analysis, Anik et al., (2021) found that culturally adapted psychotherapies were more efficacious than control treatments.

Cognitive Behaviour therapy (CBT) has been found to be the most frequently adapted approach (Anik et al, 2021; Naeem et al., 2019) with Behavioural Activation (BA) being the most common choice of treatment (Anik et al., 2021). This is line with the NICE guidance 2009) which recommends CBT and BA as treatments for depression.

Therapies such as cognitive behaviour therapy train you to be more individualistic when you have social anxiety and this could help those with collectivist values with social anxiety. According to Stopa (2009), social anxiety is associated with low clarity about the self and more uncertainty about self-judgments, which could explain why those with collectivist values may experience social anxiety in terms of how they position themselves in individualistic societies.

Some adaptations of specific mental health problems need further work e.g., it is important to support collectivist people to hold onto their values supportive

of their mental health, but changing the beliefs causing them distress. Also, encouraging individualistic people to seek social support might help with depression. If individualism places importance on autonomy, it may explain why individualists may then struggle to seek help.

Research implications

Due to the heterogeneity of the results from the studies included in the review, there is a need for future research to explore the relationship between I-C values and depression and/ or anxiety mental health presentations. Research into finding the best measures of I-C values will help start to define the best way to measure the constructs of individualism and collectivism. Research into completing intervention studies and culturally adapting therapies to incorporate I-C values will be able to add more to the current evidence-base. Future research could also go further by recruiting diverse samples and conducting studies in people's native languages.

Additional considerations

It is important to not assume patients have the same or different values as the clinician (Naeem et al., 2019). They may also not share the stereotypical values of their ethnic group. This could mitigate the chances of enacting microaggressions or cultural ruptures (as defined by Owen et al., 2014).

Another implication of this review is that it may encourage clinicians to use supervision to reflect upon their own cultural values and how these may interact with others with similar of different I-C values.

The studies included in the review were conducted predominantly in White Western countries commonly believed to be individualistic societies. If we make the assumption that living outside of the norms of your cultural values adversely impacts your mental health as found by Jobson, (2011), we would expect to see people living in western countries with individualistic values having better mental health. However, this does not seem to be the case in the findings of this review. For example, Tang (2013) found interpersonal dependency significantly predicted lower levels of depression in US women but not Taiwanese women. Tang's study highlights it is also important not to conflate ethnicity with I-C values or to assume that those belonging to the same or similar ethnic groups will share the same I-C values.

The findings of this review indicate that collectivism seemed to be associated with a reduction in depression. If making the assumption that ethnic minority communities belong to collectivist communities and by default embrace collectivist values then one would assume they all have lower levels of depression, however data collated over a number of years shows that this is not the case as there are differences in outcomes between different ethnic groups (NHS Race and Health Observatory, 2023).

Conclusion

In conclusion, this review may help psychological therapies professionals think about exploring I-C values with patients and using these to provide more individualised and culturally sensitive care. In CBT, for example, where the emphasis is on individualism, someone from a collectivist world view may struggle. More than cultural awareness, it is better to have I-C values awareness as I-C values also incorporate culture.

It is clear from the results, the generally held assumption that white western communities are more individualistic and other communities are collectivists should be treated with caution as this is not so clear-cut. It is hoped the findings of this review will add to the literature on meeting the mental health needs of ethnic minority communities who continue to be disadvantaged in society, although they could be used in any clinical setting with any protected characteristics.

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APPENDICES: (Supplementary material)

Appendix A- *CASP Checklist: Cohort Studies*

CASP Checklist: 10 questions to help you make sense of a Systematic Review

How to use this appraisal tool: Three broad issues need to be considered when appraising a systematic review study:

- Are the results of the study valid? (Section A)
- What are the results? (Section B)
- Will the results help locally? (Section C)

The 10 questions on the following pages are designed to help you think about these issues systematically. The first two questions are screening questions and can be answered quickly. If the answer to both is "yes", it is worth proceeding with the remaining questions. There is some degree of overlap between the questions, you are asked to record a "yes", "no" or "can't tell" to most of the questions. A number of italicised prompts are given after each question. These are designed to remind you why the question is important. Record your reasons for your answers in the spaces provided.

About: These checklists were designed to be used as educational pedagogic tools, as part of a workshop setting, therefore we do not suggest a scoring system. The core CASP checklists (randomised controlled trial & systematic review) were based on JAMA 'Users' guides to the medical literature 1994 (adapted from Guyatt GH, Sackett DL, and Cook DJ), and piloted with health care practitioners.

For each new checklist, a group of experts were assembled to develop and pilot the checklist and the workshop format with which it would be used. Over the years overall adjustments have been made to the format, but a recent survey of checklist users reiterated that the basic format continues to be useful and appropriate.

Referencing: we recommend using the Harvard style citation, i.e.: *Critical Appraisal Skills Programme (2018). CASP (insert name of checklist i.e. Systematic Review) Checklist. [online] Available at: URL. Accessed: Date Accessed.*

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Paper for appraisal and reference:

Section A: Are the results of the review valid?

1. Did the review address a clearly focused question?

Yes ☐
Can't Tell ☐
No ☐

HINT: An issue can be 'focused' In terms of
- the population studied
- the intervention given
- the outcome considered

Comments:

2. Did the authors look for the right type of papers?

Yes ☐
Can't Tell ☐
No ☐

HINT: 'The best sort of studies' would
- address the review's question
- have an appropriate study design (usually RCTs for papers evaluating interventions)

Comments:

Is it worth continuing?

3. Do you think all the important, relevant studies were included?

Yes ☐
Can't Tell ☐
No ☐

HINT: Look for
- which bibliographic databases were used
- follow up from reference lists
- personal contact with experts
- unpublished as well as published studies
- non-English language studies

Comments:

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4. Did the review's authors do enough to assess quality of the included studies?

Yes ☐
Can't Tell ☐
No ☐

HINT: The authors need to consider the rigour of the studies they have identified. Lack of rigour may affect the studies' results ("All that glisters is not gold" Merchant of Venice – Act II Scene 7)

Comments:

5. If the results of the review have been combined, was it reasonable to do so?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider whether
- results were similar from study to study
- results of all the included studies are clearly displayed
- results of different studies are similar
- reasons for any variations in results are discussed

Comments:

Section B: What are the results?

6. What are the overall results of the review?

HINT: Consider
- If you are clear about the review's 'bottom line' results
- what these are (numerically if appropriate)
- how were the results expressed (NNT, odds ratio etc.)

Comments:

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7. How precise are the results?

HINT: Look at the confidence intervals, if given

Comments:	

Section C: Will the results help locally?

8. Can the results be applied to the local population?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider whether
- the patients covered by the review could be sufficiently different to your population to cause concern
- your local setting is likely to differ much from that of the review

Comments:	

9. Were all important outcomes considered?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider whether
- there is other information you would like to have seen

Comments:	

10. Are the benefits worth the harms and costs?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
- even if this is not addressed by the review, what do you think?

Comments:	

Appendix B.

Potentially relevant studies that were identified by the search but that were excluded from the narrative synthesis with reasons for exclusion.

CITATION (first author)	TITLE	DOI	REASON(S) FOR EXCLUSION
Arimitsu et al. (2019)	Differences in compassion, well-being, and social anxiety between Japan and the USA.	https://doi.org/10.1007/s12671-018-1045-6	No values measure
Aruta et al. (2021)	Self-Stigma Is Associated with Depression and Anxiety in a Collectivistic Context: The Adaptive Cultural Function of Self-Criticism	https://doi.org/10.1080/00223980.2021.1876620	No values measure
Bailey and Kind (2010)	Preliminary findings of an investigation into the relationship between national culture and EQ-5D value sets	10.1007/s11136-010-9678-5	No mental health measure
Bartucz et al. (2022)	Cognitive vulnerabilities and depression: A culture-moderated meta-analysis.	https://doi.org/10.1007/s10608-022-10299-9	Meta-analysis
Brockyeld et al. (2014)	Social anxiety and social anxiety disorder across cultures.	10.1016/B978-0-12-394427-6.00006-6	Book chapter discussing social anxiety across cultures
Caldwell-Harris and Aycicegi (2006)	When Personality and Culture Clash: The Psychological Distress of Allocentrics in an Individualist	https://doi.org/10.1177/1363461506066982	Not a common mental health problem

	Culture and Idiocentrics in a Collectivist Culture		
Chang et al. (2017)	Cultural identity and the expression of depression: A social identity perspective.	https://doi.org/10.1002/casp.2291	No values measure
Chang et al. (2013)	Cultural meaning of perceived control: A meta-analysis of locus of control and psychological symptoms across 18 cultural regions.	10.1037/a0028596	Meta-analysis
Chen (1996)	Anxiety and Depression: East and West	No DOI Requested from the library Anxiety and depression: East and West. (apa.org)	Discussion paper
Chirkov et al., (2005)	Application of the scenario questionnaire of horizontal and vertical individualism and collectivism to the assessment of cultural distance and cultural fit	https://doi.org/10.1016/j.ijintrel.2005.05.014	Measure being developed and validated
Eysenck and Eysenck, (2010)	Cross-cultural approach to anxiety disorders	10.2224/sbp.2010.38.6.759	No values measures
Frank and Hou (2019)	Source-country individualism, cultural shock, and depression among immigrants	https://doi.org/10.1007/s00038-019-01218-z(0123456789().,-volV	no values measures
Frias et al. (2014)	Individualism and collectivism	https://doi.org/10.1177/0265407513484631	No mental health measure

	as moderators of the association between attachment insecurities, coping, and social support.		
Heinrichs et al. (2006)	Cultural differences in perceived social norms and social anxiety.	https://doi.org/10.1016/j.brat.2005.09.006	No values measure
Hoffman et al. (2010)	Cultural aspects in social anxiety and social anxiety disorder.	https://doi.org/10.1002/da.20759	Review of other studies
Jobson and O'Kearney (2008)	Cultural differences in personal identity in post-traumatic stress disorder	DOI:10.1348/014466507X235953	No validated values measure. Also not an association study
Jobson et al (2018)	Jobs on impact of culture on autobiographical life structure	DOI: 10.1111/bjc.12181	Not measuring values
Kashihara et al. (2019)	Perceptions of traditional and modern types of depression: A cross-cultural vignette survey comparing Japanese and American undergraduate students	10.1111/pcn.12838	No values measure
Kim and Cho (2008)	The Relationship of Social Phobia with the Concern for Offending Others, Anger-related variables, and Individualism-Collectivism	10.15842/kjcp.2008.27.3.003	Not in English. Published in the Korean Journal of Clinical Psychology

Kirsh and Kuiper (2002)	Individualism and relatedness themes in the context of depression, gender, and a self-schema model of emotion.	10.1037/h0086904	Not a study-paper exploring themes of individualism and relatedness in the context of depression and gender
Krause et al. (2015)	Changing communities and increases in the prevalence of depression: Is there a relationship?	DOI:10.11144/JAVERIANA.UPSY14-4.CCIP	Discussion paper
Kyung et al. (2021)	The Effects of Individualism-collectivism, Sociotropy-autonomy, and Resilience on Alienation, Anxiety, and Depression during COVID-19 Pandemic in South Korea	No DOI The Effects of Individualism-collectivism, Sociotropy-autonomy, and Resilience on Alienation, Anxiety, and Depression during COVID-19 Pandemic in South Korea - article	Not in English
Lawrence (2022)	Collectivism at the individual level: A moderator of the relationship between emotion suppression and personal strain	https://doi.org/10.1007/s12144-022-04028-4	No mental health measure
Liu et al. (2017)	Using a cultural and RDoC framework to conceptualize anxiety in Asian Americans	https://doi.org/10.1016/j.janxdis.2016.09.006	Discussion paper
Lundquist (2010)	Examining the moderating effects of individualism and collectivism on the relationship	No DOI Dissertation Abstracts International: Section B: The Sciences and Engineering	Participants under 18 years

	between self-efficacy beliefs and depression: A test of competing hypotheses in Northern Plains American Indian youth.	Examining the moderating effects of individualism and collectivism on the relationship between self-efficacy beliefs and depression: A test of competing hypotheses in Northern Plains American Indian youth - ProQuest	
Miller et al. (2021)	Communal Mastery and Associations With Depressive and PTSD Symptomatology Among Urban Trauma-Exposed Women	10.1037/cdp0000473	Pre-school children
Mossakowski, (2007)	Are Immigrants healthier? The case of depression among Filipino Americans	https://doi.org/10.1177/019027250707000307	No values measures
Nosheen et al. (2017)	Mental health outcomes of sense of coherence in individualistic and collectivistic culture: Moderating role of social support.	No DOI Mental health outcomes of sense of coherence in individualistic and collectivistic culture: Moderating role of social support (researchgate.net)	No values measure
Okawa et al. (2021)	A Cross-Cultural Comparison of the Bivalent Fear of Evaluation Model for Social Anxiety	10.1016/j.jbct.2021.01.003	No values measures
Reyes et al. (2020)	Resilience, Trauma, and Cultural Norms Regarding Disclosure of Mental Health Problems	https://doi.org/10.1080/08964289.2020.1725413	No values measure

	among Foreign-Born and US-Born Filipino American Women		
Sah, (1999)	Cross-cultural determinants of depression among Southeeast Asian Indian immigrants in the United States	https://www.proquest.com/dissertations-theses/cross-cultural-determinants-depression-among/docview/304505466/se-2?accountid=13828	Unclear if validated core values measures used
Sastry and Ross (1998)	Asian ethnicity and the sense of personal control.	https://doi.org/10.2307/2787064	No measure for mental health
Sato (2003)	Individualistic and collectivistic cognitions on depressive and nondepressive Chinese and Caucasian college students.	Individualistic and collectivistic cognitions on depressive and nondepressive Chinese and Caucasian college students - ProQuest	Focus on cognitions and not mental health
Shavitt et al. (2016)	Culture Moderates the Relation Between Perceived Stress, Social Support, and Mental and Physical Health	https://doi.org/10.1177/0022022116656132	No psychometrically validated measures
Schreier et al. (2010)	Social anxiety and social norms in individualistic and collectivistic countries	10.1002/da.20746	No values measure
Shim et al. (2016)	Familial, social, and cultural factors influencing panic disorder: Family therapy case of Korean wife and	https://doi.org/10.1080/01926187.2016.1145085	Qualitative study

	American Husband.		
Steptoe et al. (2007)	Depressive symptoms, socio-economic background, sense of control, and cultural factors in university students from 23 countries.	10.1007/BF03004175	No values measure
Tse et al (2021)	Focusing too much on individualistic achievement may generate stress and negative emotion: Social rank theory perspective	10.1177/1359105319864650	No values measure
Tae-Jin (2017)	The Relationship between Cultural Disposition and Mental Health, Subjective Well-being of University Students, and Gender Differences in Those Relationships	10.13000/JFMSE.2017.29.6.1994	Not in English
Wang (2007)	Perfectionism, depression, and self-esteem: A comparison of Asian and Caucasian Americans from a collectivistic perspective.	Dissertation Chapter 3 (psu.edu)	Developing a measure
Wei et al (2010)	Racial discrimination stress, coping, and depressive symptoms among Asian Americans: A	DOI: 10.1037/A0020157	No values measure

	moderation Analysis		
Yoo (1996)	Individualism-collectivism, attribution styles of mental illness, depression symptomatology, and attitudes toward seeking professional help: A comparative study between Koreans and Americans.	Dissertation Individualism-collectivism, attribution styles of mental illness, depression symptomatology, and attitudes toward seeking professional help: A comparative study between Koreans and Americans - ProQuest	Not an association study

Appendix C. *Risk of bias table for observational cohort studies*

Author and Year	*Issue clearly focused?*	*Was the cohort recruited in an acceptable way?*	*Was the exposure accurately measured to minimise bias?*	*Was the outcome accurately measured to minimise bias?*	*Have the authors identified all important confounding factors?*	*Have they taken account of the confounding factors in the design and/or analysis?*	*Was the follow up of subjects complete enough?*	*Was the follow up of subjects long enough?*	*What are the results of this study?*	*Were the results precise?*	*Do you believe the results?*	*Can the results be applied to the local population?*	*Do the results of this study fit with other available evidence?*	*What are the implications of this study for practice?*	**Overall rating**
Akdogan & Çimsir, (2022)	Y	Y	Y	Y	CT	Y	N/A	N/a	Inferiority feelings fully mediate relationship between collectivist ambivalence and social anxiety	Y	Y	N	N	CT- Further research required	Moderate risk- agree
Aruta et al. (2021)	Y	N	Y	Y	CT	Y	N/A	N/A	Internal self-criticism predicted depression	Y	Y	N	Y	Implement interventions to decrease internal self-criticism	Moderate risk- agree
Bilican et al. (2016)	Y	Y	Y	Y	Y	Y	N/A	N/A	Values of universalism predicted lower depression	Y	Y	CT	CT	Only some values predict depression	Moderate risk- agree
Bhullar et al.	Y	N	Y	Y	Y	Y	N/A	N/A	Collectivism predicted	Y	Y	N	N	Further research required	Moderate risk- agree

(2012)									depression in Indian sample						
Cepeda (2011)	**Y**	**N**	**Y**	**Y**	**Y**	**CT**	**N/A**	**N/A**	No support for coping strategies mediating association between stress and mental health	**N**	**CT**	**N**	**CT**	Further research required	High risk Moderate risk
Du et al. (2015)	**Y**	**CT**	**CT**	**Y**	**Y**	**Y**	**Y**	**Y**	Acculturative stress and self-efficacy mediators between collectivist orientation and depression	**Y**	**Y**	**N**	**CT**	Further research required	Moderate risk- agree
Hahn (2010)	Y	Y	Y	Y	Y	Y	N/A	N/A	Vertical Individualism is a significant moderator and mediator between acculturative stress and depression	**CT**	**Y**	**N**	**CT**	Sheds light on how culture interacts with stress and depression	Moderate risk- agree
Ho (1994)	Y	N	Y	Y	CT	CT	N/A	N/A	Individualism and collectivism not related to depression	Y	Y	N	CT	CT	Moderate risk- agree
Hong and Woody, (2007)	Y	Y	Y	CT	CT	CT	N/A	N/A	Independent self-construal fully mediates ethnic differences in social anxiety	Y	Y	Y	y	Independent self-construal fully mediates ethnic differences in social anxiety	Moderate risk- agree
Humphrey et al. (2020)	Y	N	Y	Y	CT	CT	N/A	N/A	Vertical individualism negatively impacts wellbeing	Y	Y	N	Y	Educate people on the importance of building support network	Moderate risk- agree

Jeffrey (2020)	Y	Y	Y	Y	N	N	N/A	N/A	Individualism significantly predicted depression	CT	CT	N	CT	Social support may benefit students.	High risk- agree
Jobson (2011)	Y	Y	Y	Y	N	N	N/A	N/A	Those who deviate from their cultural norms more vulnerable to developing PTSD	Y	CT	N	Y	CT Further research required	Moderate risk- agree
Jobson & O'Kearney (2009)	Y	Y	Y	Y	N	N	N/A	N/A	Cultural variation in self was a moderator in the relationships between cognitive variables and PTSD.	Y	Y	Y	Y	Explore impact of trauma on appraisals associated with self	Moderate risk- agree
Kaczkurkin et al. (2022)	Y	Y	Y	N	CT	CT	Y	Y	Interdependent self-construal positively associated with social anxiety, independent negatively associated with social anxiety	Y	Y	CT	Y	Explore self-construal to help understand presentation	Moderate risk- agree
Knyazev et al. (2017)	Y	N	Y	Y	N	N	N/A	N/A	Maladaptive emption regulation mediated effect of neuroticism on depression in low individualistic	Y	Y	N	N	Can't make causal links. Further research is required	Moderate risk- agree
Lin et al. (2017)	Y	Y	Y	Y	Y	Y	N/A	N/A	High collectivism moderated relationship between attachment anxiety and depression.	Y	Y	N	CT	Not to make assumptions about cultural differed	Moderate risk- agree
Lopez	Y	N	Y	Y	Y	Y	N/A	N/A	Cultural values not significant	Y	Y	N	N	No clinical implications	High risk- agreed

(2011)									predictors of depression					shared/ Further research is required	
Msetfi et al. **(2015)**	Y	Y	Y	Y	Y	CT	N/A	N/A	High collectivist values fully mediated the association between perceived control and depression	Y	Y	N	Y	Clinicians need to explore role of values in relationship between perceived control and depression	Moderate risk- agree
Nezlek and Humphrey **(2023)**	Y	Y	Y	Y	CT	CT	N/A	N/A	Vertical individualism negatively related to depression and anxiety, horizontal positively related to depression and anxiety, vertical collectivism positively related to depression	Y	N	N	CT	Important to distinguish between different cultural values and their dimensions	Moderate risk- agree
Scott et al. **(2004)**	Y	CT	Y	Y	Y	Y	N/A	N/A	Idiocentrism unrelated to depression Social support not a significant moderator between idiocentrism and mental health	Y	Y	N	CT	Individuals may benefit from learning about their cultural values and impact of these on their mental health	Moderate risk- agree
Senan et al. **(2019)**	Y	Y	Y	Y	N	N	N/A	N/A	High levels of perceived control predict higher horizontal collectivism and lower depression.	Y	Y	CT	Y	Therapists should be aware cultural values may influenceperceived control and depression	Moderate risk- agree

Siu and Chang (2011)	Y	Y	CT	Y	CT	CT	N/A	N/A	Coping strategies did not mediate the relationship between stress-related events and psychological distress	Y	Y	N	Y	Enhance the role of family as a support network, explore religious as spiritual coping strategies	Moderate risk- agree
Syn (2014)	Y	Y	Y	Y	Y	Y	N/A	N/A	Higher interdependence self-construal associated with higher social anxiety. Higher independence self-construal associated with lower social anxiety	Y	Y	N	CT	Further research required.	Moderative risk- agree
Tafarodi and Smith (2001)	Y	Y	Y	Y	Y	Y	Y	Y	Positive events reduced depression for Malaysians, positive achievement reduced depression for British students only	Y	Y	N	CT	Understanding cultural-based susceptibilities to support wellbeing of students	Moderate risk- agree
Tang (2013)	Y	CT	Y	Y	CT	CT	N/A	N/A	Depression negatively associated with collective subscales of harmony towards friends and harmony towards colleagues in US women only	C T	CT	N	Y	Recommend building self-esteem to reduce depression, nut further research required	High risk- agree
Wai et al. (2019)	Y	Y	Y	Y	CT	CT	N/A	N/A	Collective coping subscales of acceptance,	Y	N	CT	CT	Limited information, apart from the	High risk- agree

									reframing and striving (ARS), family support, and Private emotional outlet were positively associated with wellbeing					need to work with students on their coping strategies.	
Yoon et al. **(2020)**	Y	Y	Y	CT	CT	CT	N/A	N/A	Patriarchal beliefs positively only associated with depression only at low levels of vertical collectivism	Y	Y	Y	Y	Explore gender-related beliefs in relation to their cultural orientations	Moderate risk- agree
Zhang and Han **(2023)**	Y	Y	Y	Y	N	CT	N/A	N/A	High individualism positively related with depression, high collectivism negatively correlated with depression	Y	Y	N	Y	Do not assume people from collectivist countries are collectivists	Moderate risk- agree

Part Two: Empirical Study

Mental health outcome inequalities in IAPT services: An investigation of the minority stress hypothesis

Abstract

Aim: Evidence shows ethnic minority communities have lower access to treatment and poorer recovery rates in *Improving Access to Psychological Therapies* (IAPT) services. Some research suggests this may be explained by socioeconomic deprivation, but other hypotheses suggest that it may have to do with sociocultural factors. This study intended to examine whether there is evidence of a *minority stress effect* – where the mental health of people from ethnic minorities (EM) may be influenced by living in neighbourhoods with low or high minority ethnic density. **Method:** Using multilevel modelling, healthcare records of 130,857 patients who had accessed Low and High Intensity psychological therapies across 16 IAPT services were analysed whilst controlling for socioeconomic deprivation. Patient-level depression (PHQ9), anxiety (GAD-7) and functioning (WSAS) outcomes measures were linked to neighbourhood ethnic density data. **Results:** Overall, we found evidence that patients from specific EM groups (*Black Caribbean, Black (other), Pakistani*, *Bangladeshi*, *White - other*) had more severe anxiety and depression symptoms after treatment, relative to white British patients. These differences were statistically significant after controlling for socioeconomic deprivation and employment status. There was some support for the minority stress effect, but only relevant to patients from *Black Caribbean, Black- other and White – other* backgrounds. **Conclusions:** There is evidence of mental health inequalities related to ethnicity, which is not fully explained by socioeconomic variables.

Keywords: depression; anxiety; ethnic minority; BAME; BME; diversity; diverse; neighbourhood; socioeconomic deprivation; minority stress; status anxiety; racism; identity; Black; Black Caribbean; Black other; Pakistani; Bangladeshi; Muslim; Islam; Islamophobia; Polish; White British

Introduction

The *Improving Access to Psychological Therapies* (IAPT) programme was set up in 2008 to deliver National Institute for Health and Care Excellence (NICE, 2011) recommended psychological therapies for common mental health problems using a stepped care approach. There are now IAPT services across all of England, offering both low intensity (brief, guided self-help) and high intensity psychological interventions (e.g., traditional psychotherapies) for depression and anxiety problems. In 2019-20, there were 1.69million referrals to IAPT services. 87.4% were seen within 6 weeks, and 1.17million started treatment. The average number of treatment sessions was 6.9 and 606,192 completed treatment (National Health Service Digital [NHS Digital], 2020). IAPT services monitor treatment response through the implementation of a standard set of psychometric measures that patients complete on a session-by-session basis. Aggregating data from these measures at a national level indicates that approximately 51.1% of patients who finished a course of treatment during 2019-20 attained recovery from depression and anxiety symptoms (NHS Digital, 2020). However, not all patients have the same probability of improvement. Benchmarking reports and meta-analyses of data from IAPT studies show clear evidence of variability in treatment outcomes between services (e.g., Clark et al., 2018; Gyani et al., 2013) and between patients with different characteristics (Wakefield et al., 2021). Delgadillo et al., (2017) found that patients from ethnic minority (EM) backgrounds had higher post-treatment distress when compared to White British patients, after controlling for socioeconomic deprivation. Similarly, Finegan et al., (2020) found poorer treatment outcomes were associated with ethnic minority (EM) groups even after controlling for individual-level and

neighbourhood-level socioeconomic variables. Furthermore, Harwood et al., (2021) reported that people from ethnic minorities were less likely to be assessed and to access treatment after referral to IAPT services. These findings point to a source of mental health inequalities, whereby psychological care may be less accessible and less beneficial for people from ethnic minorities by comparison to a majority white British population. Furthermore, this health inequality is not fully explained by socioeconomic factors such as employment status or neighbourhood socioeconomic deprivation. Other psychosocial factors may possibly have an adverse influence on the emotional wellbeing of people from ethnic minorities. It is possible that theories from social psychology may offer some plausible hypotheses.

The social identity approach (SIA) is one of the most influential theories exploring group process and intergroup relations (Hornsey, 2008). Social identity theory (Tajfel and Turner, 1979) states that human interactions range on a spectrum from purely interpersonal to purely intergroup interactions. When “us” and “them” distinctions arise in social interactions, the perceived differences among members of different social groups are enhanced (Hornsey, 2008), resulting in a perception of “ingroup” vs “outgroup” boundaries. This impacts on how we interact with each other and can lead people to feel highly connected to their “ingroup” and disconnected to or even fearful of the “outgroup”. Such social-evaluative threats have been shown to induce neuroendocrine stress reactions such as increased cortisol levels (Dickerson and Kemeny, 2004). Social support has found to be associated with decreasing cortisol (e.g., Heinrichs et al., 2003; Rohleder et al., 2007; Hausser et al., 2012). The ‘Social Cure’ model of mental health stipulates that people identifying with positive and meaningful groups experience better mental health outcomes (Jetten et al., 2012). McIntyre et al., (2016), propose that people from minority ethnic

backgrounds who develop positive and meaningful identification with the majority culture should be at lower risk of developing paranoid beliefs, however group processes such as prejudice may moderate this relationship. From this perspective, constantly perceiving oneself to be "other" and part of the "outgroup" could possibly result in a heightened stress response; particularly if the "outgroup" is perceived to be the target of prejudice. On the other hand, bonding with and feeling integrated within a supportive "ingroup" could have a protective effect.

The process of ingroup-outgroup relations concerning race and ethnicity has also been examined from the perspective of the "minority stress" theory. Minority stress can be described as psychosocial stress derived from minority status (Brooks, 1981; Meyers, 1995). When a minority person perceives themselves to be different to the dominant culture (i.e., the "in group") this may result in heightened stress (Meyer, 1995). Furthermore, being subjected to racially motivated stigmatisation and overt threat (also referred to as "outgroup derogation") can lead to adverse mental health outcomes (Meyer, 1995). A logical extension of these arguments is that people from minorities may experience more chronic sources of stress if they live in environments where [a] their difference to the majority group is continually evident (i.e., "being obviously outnumbered" and part of the "outgroup") and [b] they are exposed to overt threat in relation to their minority status (i.e., experiencing racist discrimination). In this sense, being from a minority (i.e., related to race/ethnicity, or gender orientation, or religious belief, or social class, etc.) can be a source of chronic stress, even in the absence of overt discriminatory or stigmatising experiences. Simply being part of the "outgroup" may be enough to induce a sense of stress in some situations, and this stress can be made worse by overt threats and injustices.

Related to the minority stress effect is the “ethnic density effect” which is the phenomenon whereby those living in areas with people of the same ethnicity have better health, overriding the detrimental effects of material deprivation for that area (Shaw et al., 2012). “Ingroup” dense areas (i.e., more socioculturally homogeneous areas) have been proposed to provide people with more social support, less exposure to racism and a sense of positive identity (McIntyre et al., 2021; Das-Munshi et al., 2019: Shaw et al., 2012).

Some authors have challenged the above theories by pointing out that socioeconomic status better explains why people from ethnic minorities (who often live in poverty) experience elevated stress. Mirowsky & Ross (1989) concluded it was economic conditions and not stigmatisation and discrimination that related to adverse mental health outcomes amongst ethnic minorities. This suggests that those with minority status and of higher socio-economic status should not have poorer mental health compared to those from a majority ethnic background. However, Williams et al., (1997) found that race-related stress was more strongly related to mental health than physical health. Once adjusted for race-related stress, the mental health of black people tended to exceed that of white people. Williams et al., (1997) suggest by controlling for variables such as SES, we can gain a better understanding of the processes that link race and economic disadvantage to health.

Although there is greater availability of evidence-based psychological care in England through the national IAPT programme, replicated evidence suggests that people from EM groups are less likely to benefit from treatment and more likely to remain distressed. Literature in the field of social psychology provides some insights into factors that may affect mental health treatment outcomes for minority communities. In particular, the minority stress and ethnic density hypotheses could

be relevant, given that these phenomena have previously been associated with chronic stress. It is plausible that socioeconomic status, a well-known predictor of poor treatment outcomes, is likely to be a confounder that should be considered in studies investigating the minority stress effect.

Methods

Research Aims

Informed by the above evidence and theories, the present research project aimed to investigate if the minority stress and ethnic density effects were relevant predictors of treatment response for patients who access IAPT services.

This study tested the minority stress hypothesis, by examining if an interaction between the individual's ethnicity and their neighbourhood ethnic density predicted mental health treatment outcomes in IAPT services. The goal to attain equity of treatment outcomes for all members of society, irrespective of race and ethnicity, was the primary motivation behind this research. The hypotheses outlined below are intended to test the minority stress hypothesis based upon the literature cited above, and based upon the idea that being conspicuous out-group member would be associated with higher levels of stress. To test this hypothesis, this study focused on a validated measure of anxiety as a close indicator of stress and formulated secondary hypotheses using other indicators of mental health.

Six hypotheses for this study comprising of two primary and four secondary hypotheses were tested.

Primary hypotheses

1. People from EM backgrounds who lived in neighbourhoods with higher White British (WB; outgroup) density would have higher average anxiety (GAD-7) symptoms *before* treatment, compared to those living in neighbourhoods with higher EM (in-group) density.
2. People from EM backgrounds who lived in neighbourhoods with higher WB (outgroup) density would have higher average anxiety (GAD- 7) symptoms *after* treatment, compared to those living in neighbourhoods with higher EM (in-group) density.

Secondary hypotheses

3. People from EM backgrounds who lived in neighbourhoods with higher WB (outgroup) density would have higher average depression (PHQ-9) symptoms before treatment, compared to those living in neighbourhoods with higher EM (in-group) density.
4. People from EM backgrounds who lived in neighbourhoods with higher WB (outgroup) density would have higher average depression (PHQ-9) symptoms after treatment, compared to those living in neighbourhoods with higher EM (in-group) density.
5. People from EM backgrounds who lived in neighbourhoods with higher WB (outgroup) density would have higher average impairment in functioning (WSAS) before treatment, compared to those living in neighbourhoods with higher EM (in-group) density.
6. People from EM backgrounds who lived in neighbourhoods with higher WB (outgroup) density would have higher average impairment in functioning

(WSAS) symptoms before treatment, compared to those living in neighbourhoods with higher EM (in-group) density.

Design, setting and interventions

This study was conducted using routinely collected IAPT data. Retrospective outcome measures for patients aged 18 years and above receiving evidence-based psychological treatments (National Institute for Health and Care Excellence, 2011) in IAPT (primary care mental health) services for depression and anxiety disorders during the period between January 2014-2017 were analysed. Data from eight National Health Service (NHS) trusts managing 16 IAPT services were analysed. These areas are socioeconomically diverse areas in England and include London, Cambridge, Heywood, Middleton, Rochdale, Oldham, Bury, Stockport, Tameside & Glossop, Trafford, Barnsley, Cheshire & Wirral and East Riding. Electronic health records for patients treated in these trusts were extracted after receiving ethical approval. These records are structured using a standard template called the IAPT minimum dataset, which included anonymised demographic and clinical outcomes data. Session by session outcome measures were available, and the last observed outcome measure was taken as the final treatment outcome measure. Therefore, missing outcomes data for patients who had dropped out of treatment were imputed using a last observation carried forward (LOCF) method.

Data for both low intensity therapies CBT (LiCBT) as well as high intensity therapies were analysed, considering that some patients access both types of interventions as part of a single treatment episode and care pathway. LiCBT interventions for mild-to-moderate depression and anxiety problems are based upon

principles of cognitive behaviour therapy and delivered in a variety of formats, for example, computerised CBT, group therapy and individual therapy offering <8 sessions. High intensity therapies include cognitive behaviour therapy (HiCBT), counselling, eye movement desensitisation and reprocessing (EMDR) and interpersonal psychotherapy (IPT). These therapies offer up to 20 sessions if a patient does not improve after accessing low intensity therapies or if they are presenting with more severe difficulties.

Ethical approval had already been obtained to analyse this multi-service dataset from the London City & East NHS Research Ethics Committee (06/01/2016, Ref: 15/LO/2200).

Measures

The IAPT programme requires patients to complete routine outcome measures on a weekly basis, therefore baselines measures and end of therapy measures are available.

Primary outcome measure: The Generalised Anxiety Disorder scale (GAD-7) is a 7-item measure of anxiety symptoms (Spitzer et al., 2006). Overall scores vary between 0-21. Items are scored on a scale from 0 to 3 with 0 meaning 'not at all' and 3 meaning 'nearly every day.' A score of ≥8 indicates clinically significant anxiety, with sensitivity (77%) and specificity (82%; Kroenke et al., 2007). Please see appendix 2 for the GAD-7.

Secondary data

Depression: The Patient Health Questionnaire (PHQ-9) is a 9-item depression measure (Kronenke, et al., 2001). Each item has the response option of 0, not at all to 3, nearly everyday. Overall scores vary between 0 and 27. A score of >10 is

considered to be clinically significant, with sensitivity (88%) and specificity (88%; Kronenke, et al., 2001). The PHQ-9 can be self-administered by patients although some patients may require support from therapists to complete the measure. Please see appendix 1 for the PHQ-9.

Impaired functioning: The Work and Social Adjustment Scale (WSAS) is a measure of impaired functioning across five domains: work, home management, social leisure activities, private leisure activities and family and relationships (Mundt, et al., 2002). Each of these domains are rated between 0 (no impairment) to 8 (very severe impairment) with a total severity scale between 0-40. There are no established clinical cut-off scores for the WSAS. Please see appendix 3 for the WSAS.

Neighbourhood socioeconomic deprivation: Patients' postcodes were linked to the English Index of Multiple Deprivation (IMD; Department for Communities and Local Government, 2015). The IMD measures relative deprivation for geographical areas in England with an average of 1,500 residents in each neighbourhood. These are referred to as Lower-layer Super Output Areas (LSOA) ranking from the most deprived to the least deprived based on a composite index. This composite index is derived from seven domains of area level deprivation. These are income deprivation, unemployment, education level, poor health and disability, crime, barriers to housing and services, and quality of the local environment. Using the work of Townsend (1979; 1987) these domains are combined into local IMD scores and decile groups (where 1= most deprived areas, 10=least deprived areas). The employment domain however is reverse scored. As each patient can be matched to their corresponding neighbourhood IMD and decile classifications, therefore their postcodes were removed to maintain anonymity.

Demographic information is routinely collected in IAPT (Table 2) and was also used to describe the sample and control for individual-level employment status.

Sample characteristics

146,078 patients accessed treatment across participating services. Data analysed included cases that accessed LiCBT and/or HiCBT and who had clinically significant levels of anxiety and/or depression symptoms at the time of initial assessment in an IAPT service (N= 130,857). From this sample, 48.3% (n=61,451) of patients only accessed low-intensity interventions and 37.7% (n= 48003), accessed high intensity interventions. Approximately 14% (n=17882), were stepped up after LiCBT. The characteristics of the selected sample are summarised in Table 1.

Table 1.

Sample Characteristics

Sample N = 130,857
(LiCBT = 79,333; HIT = 65,885 of whom 17,882 accessed both LiCBT and HiCBT; clinical pathway not recorded = 3521)

Demographics*	
Male	44,099/130,700 (33.7%)
Female	86,601/130,700 (66.3%)
Age (M; SD)	39.89 (14.66)
Unemployed	33,786/120,270 (28.1%)
Medication (prescribed and taking)	53,493/110,060 (48.6%)
Medication (prescribed and not taking)	9679/110060 (8.8%)
IMD 1 (most deprived)	583/2913 (20.0%)
IMD 10 (least deprived)	36/2913 (1.2%)
Ethnicity	
White British	102,012/130,857 (78%)

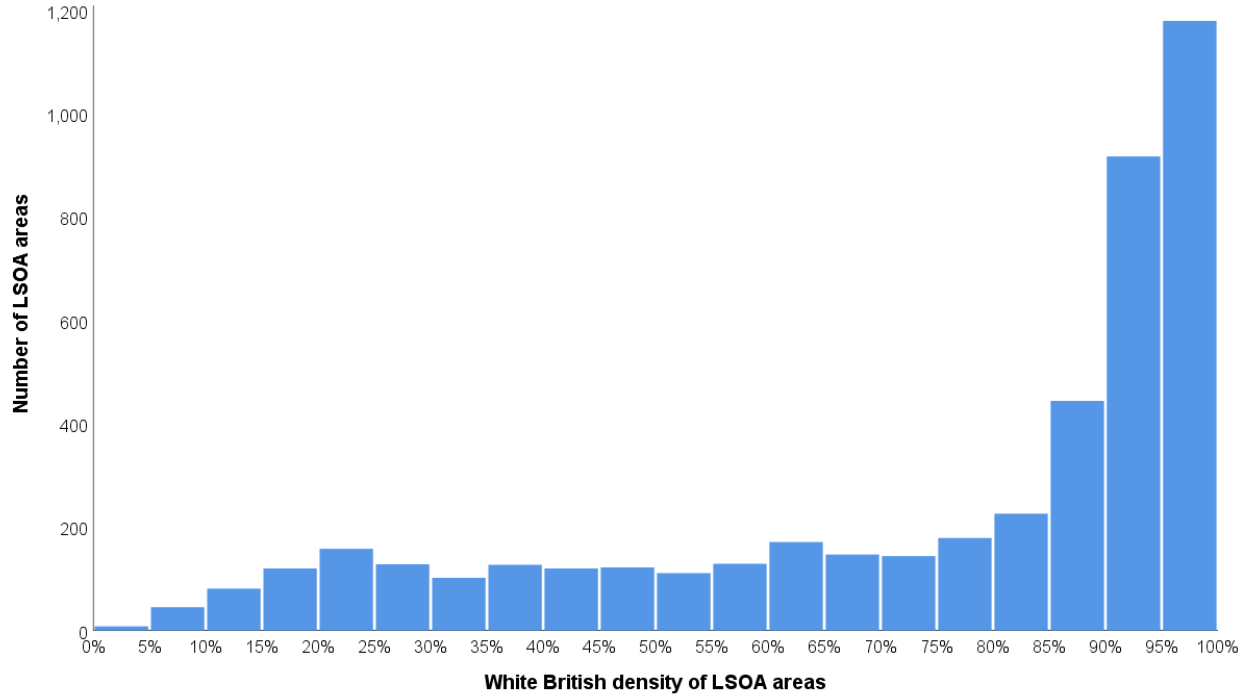
White Irish	1434/ 130,857 (1.1%)
White (other)	8719/130,857 (6.7%)
White and Black Caribbean	1118/130,857 (0.9%)
White and Black African	491/130,857 (0.4%)
White and Asian	608/130,857 (0.5%)
Mixed (other)	1265/130,857 (1.0%)
Indian	2070/130,857 (1.6%)
Pakistani	2913/130,857 (2.2%)
Bangladeshi	1038/130,857 (0.8%)
Asian (other)	1664/130,857 (1.3%)
Black Caribbean	2604/130,857 (2.0%)
Black African	2099/130,857 (1.6%)
Black (other)	783/130,857 (0.6%)
Chinese	323/130,857 (0.2%)
Other	1716/130,857 (1.3%)
Diagnosis*	
Affective disorder	446,13/117,368 (38%)
GAD	16161/117,368 (13.8%)
Mixed	34722/117,368 (29.6%)
Panic/ agoraphobia	3662/117,368 (3.1%)
Social phobia	2164/117,368 (1.8%)
Specific phobia	822/117,368 (0.7%)
OCD	2597/117,368 (2.2%)
PTSD	4168/117,368 (3.6%)
Other	8459/117,368 (7.2%)
Baseline PHQ-9 mean score (SD)	16.35 (5.63)
Baseline GAD-7 mean score (SD)	14.65 (4.39)
Baseline WSAS mean score (SD)	21.0 4 (9.54)
Total mean number of sessions (SD, IQR)	7.25 (5.41, 3-9)
LiCBT mean number of sessions (SD, IQR)	3.74 (2.9, 1-6)
HiCBT mean number of sessions (SD, IQR)	7.33 (5.41, 3-10)

*Percentages exclude cases with missing data; LiCBT, low-intensity cognitive behaviour therapy; HiCBT, high-intensity cognitive behaviour therapy; IMD, index of multiple deprivation; GAD= generalised anxiety disorder; OCD= obsessive compulsive disorder; PTSD= Post-Traumatic Stress Disorder; PHQ-9= measure of depression; GAD7= measure of anxiety; WSAS= work and social adjustment scale.

The majority (1,291) of the LSOA areas were in majority-dense neighbourhoods with a white British population density above 90% (Figure 1).

Figure 1.

LSOA White British dense areas



Statistical analysis

Multilevel modelling (MLM) was used for statistical analysis of the archival clinical data described above (Raudenbush, & Bryk,. 2002; Snijders & Bosker, 2011). Sometimes termed hierarchical linear modelling (HL-M), it recognises the

hierarchical, nested structure of the data with patients at level 1 nested within neighbourhoods (lower super output areas– LSOA) at level 2. Six MLM models were developed, testing six hypotheses. In each model, the dependent variable was a validated outcome measure (PHQ-9, GAD-7, WSAS), and the independent variables included patient-level ethnicity, neighbourhood-level index of multiple deprivation (IMD), neighbourhood-level ethnic density (expressed as % of WB residents) and employment status (unemployed vs. others [employed, student, home-maker, retired]). The predictor variable of interest was the cross-level interaction between the WB density of the LSOA (a higher-level variable) and EM patients (a patient-level variable) and this was tested for significance for each outcome. The models, where a post-treatment outcome is the dependent variable additionally controlled for baseline severity in the same outcome measure.

Consistent with conventional model-building guidelines (Raudenbush et al., 2002), continuous predictors were grand mean-centred and MLM was performed in sequential steps, starting with single-level models and eventually developing multi-level and covariate-adjusted models that optimize goodness-of-fit. Model fit was examined after each modelling step by inspecting the standard error of regression coefficients and the log-likelihood ratio test. Variables were considered significant in the model if the coefficient was greater than 1.96 of the standard error. Model fit was examined by a reduction in the loglikelihood ratio which indicated a better model fit.

Sample size calculation

Guidelines for the estimation of reliable higher-level effects in a multi-level model vary according to different authors. According to Kreft & De Leeuw (1998) the

acceptable number of nesting groups as a minimum is 30. Maas & Hox (2005) suggest a minimum of 50 higher-level units (i.e., neighbourhoods in the present study) as anything less leads to biased estimates. However, they do acknowledge that a smaller sample size of 10 groups comprising of five units can be useful if only looking at regression coefficients. Busing (1993) and Van der Leeden & Busing (1994) have demonstrated that groups of over 100 are required for accurate group-level variance. Snijders & Bosker (2011) also identify large numbers of higher-level units as most important where the aim is to test a cross-level effect. Reasonable estimates have been found where there were very few, (as low as one) level 1 units (patients) per higher level unit (LSOA) (Snijders & Bosker, 2011).

It was calculated that the available dataset for this study included N>100,000 patients nested within >3,000 neighbourhoods (LSOAs). This represented a much larger sample size than that required by conventional guidelines described above, where –typically– 1,500 cases would have to be nested within 30 or more nesting clusters. The number of patients included in this study were all those from within those LSOAs. The number of LSOAs in the current study far exceeded the minimum requirements for MLM, and as the cross-level effect is of interest, most LSOAs could be included. Therefore, a sample of those LSOAs with a minimum of 5 patients were selected for this study.

Results

Primary outcome: Anxiety (GAD-7)

The final MLM models controlled for IMD and patient-level variables, and modelled cross-level interactions between ethnicity and neighbourhood-level density of white British residents. The main results of fully-adjusted models are presented in

Tables 2 and 3 for pre- and post-treatment GAD-7 scores as dependent variables. The corresponding fully-adjusted models for pre- and post-treatment PHQ9 and WSAS are presented in appendices A, B, C and D.

Table 2.

Case-mix adjusted multilevel model examining selected neighbourhood-level variables as predictors of pre-treatment anxiety (GAD-7) severity

Fixed effects					
Patient-level variables	**B**	**SE**	**Ci-Low**	**Ci-high**	***p***
cons	14.168	0.018	14.132	14.205	< .001*
White Irish	0.139	0.134	-0.125	0.402	0.302
White (other)	0.22	0.071	0.081	0.359	0.002*
White and Black Caribbean	0.088	0.178	-0.262	0.437	0.623
White and Black African	0.259	0.275	-0.279	0.798	0.346
White and Asian	-0.157	0.216	-0.581	0.267	0.468
Mixed (other)	0.086	0.163	-0.233	0.405	0.596
Indian	0.396	0.164	0.075	0.717	0.016*
Pakistani	0.62	0.153	0.32	0.92	< .001*
Bangladeshi	0.685	0.295	0.107	1.262	0.020*
Asian (other)	0.387	0.178	0.037	0.736	0.030*
Black Caribbean	-0.256	0.18	-0.608	0.097	0.155
Black African	-0.21	0.173	-0.55	0.13	0.227
Black (other)	0.046	0.273	-0.49	0.581	0.867
Chinese	-0.468	0.285	-1.026	0.09	0.100
Other	0.544	0.15	0.25	0.838	< .001*
Unemployed	1.329	0.029	1.273	1.385	< .001*
Neighbourhood-level variables					
(IMD_decile_2015-gm)	-0.136	0.006	-0.147	-0.125	< .001*
(LSOA_WB_density-gm)	0.01	0.001	0.008	0.011	< .001*
White Irish.(LSOA_WB_density-gm)	0.003	0.004	-0.006	0.011	0.564
White (other).(LSOA_WB_density-gm)	-0.009	0.002	-0.013	-0.005	< .001*
White and Black Caribbean.(LSOA_WB_density-gm)	-0.015	0.005	-0.025	-0.005	0.003*
White and Black African.(LSOA_WB_density-gm)	0.002	0.008	-0.014	0.018	0.828
White and Asian.(LSOA_WB_density-gm)	-0.015	0.007	-0.028	-0.002	0.020*
Mixed (other).(LSOA_WB_density-gm)	-0.012	0.005	-0.021	-0.003	0.009*
Indian.(LSOA_WB_density-gm)	-0.007	0.004	-0.015	0.001	0.068

Pakistani.(LSOA_WB_density-gm)	-0.012	0.003	-0.019	-0.005	0.001*
Bangladeshi.(LSOA_WB_density-gm)	-0.004	0.007	-0.017	0.009	0.541
Asian (other).(LSOA_WB_density-gm)	-0.015	0.004	-0.024	-0.006	0.001*
Black Caribbean.(LSOA_WB_density-gm)	0	0.004	-0.008	0.008	0.985
Black African.(LSOA_WB_density-gm)	-0.01	0.004	-0.019	-0.002	0.020*
Black (other).(LSOA_WB_density-gm)	0.003	0.007	-0.01	0.017	0.603
Chinese.(LSOA_WB_density-gm)	-0.012	0.009	-0.031	0.007	0.203
Other.(LSOA_WB_density-gm)	-0.007	0.004	-0.016	0.001	0.074

Covariance parameters

Effects	**Variance**	**SE**	***p***	**ICC**
Residual effect (patient)	18.533	0.076	<0.001*	
Random effect (neighbourhood)	0.136	0.016	<0.001*	0.007

B = regression coefficient; SE = standard error; CI = 95% confidence intervals; ICC = intraclass correlation coefficient; mc = mean centred;

PHQ-9 = patient health questionnaire (depression); GAD-7 = generalized anxiety disorder (anxiety);
WSAS = work and social adjustment scale; ethnicity-related variables highlighted in green replicated in both Tables 2 and 3, whereas those highlighted in yellow were only significant in this Table (e.g., model)

-2 log likelihood = 693088.008

Table 2 above shows statistically significant main effects for specific ethnic groups: *White (other), Indian, Pakistani, Bangladeshi, Asian (other)* and *Other*. This indicates that these patients had **higher than average** pre-treatment anxiety scores in comparison to the *White British* group after controlling for individual employment status and neighbourhood socioeconomic deprivation (IMD).

Statistically significant cross-level interactions between ethnicity and neighbourhood WB ethnic density were found for specific ethnic groups: *White (other), White and Black Caribbean, White and Asian, Mixed (other), Pakistani, Asian (other),* and *Black African*. Patients from these ethnic groups had **lower than average** pre-treatment anxiety scores if they were living in neighbourhoods with a higher level of WB density.

The model also shows that unemployment was significantly associated with more severe pre-treatment anxiety, while the IMD score was inversely related to anxiety severity (people in more deprived neighbourhoods were more anxious).

Table 3.

Case-mix adjusted multilevel model examining selected neighbourhood-level variables as predictors of post-treatment anxiety (GAD-7) severity

Fixed effects					
Patient-level variable	**B**	**SE**	**Ci-Low**	**Ci-high**	***p***
cons	8.28	0.024	8.232	8.327	< .001*
(GAD7_first-gm)	0.494	0.004	0.486	0.502	< .001*
White Irish	-0.01	0.179	-0.361	0.342	0.958
White (other)	0.328	0.099	0.133	0.523	0.001*
White and Black Caribbean	0.383	0.24	-0.087	0.853	0.110
White and Black African	-0.397	0.381	-1.145	0.35	0.297
White and Asian	0.457	0.292	-0.115	1.03	0.117
Mixed (other)	0.513	0.219	0.083	0.943	0.019*
Indian	0.431	0.219	0.003	0.86	0.049*
Pakistani	1.071	0.203	0.673	1.469	< .001*
Bangladeshi	1.046	0.386	0.289	1.803	0.007*
Asian (other)	0.586	0.24	0.116	1.056	0.014*
Black Caribbean	0.285	0.236	-0.177	0.746	0.226
Black African	-0.072	0.227	-0.517	0.373	0.751
Black (other)	0.883	0.361	0.176	1.59	0.014*
Chinese	0.096	0.399	-0.685	0.878	0.809
Other	0.581	0.206	0.177	0.985	0.005*
Unemployed	3.001	0.038	2.926	3.076	< .001*
Neighbourhood-level variables					
(IMD_decile_2015-gm)	-0.134	0.007	-0.149	-0.12	< .001*
(LSOA_WB_density-gm)	0.002	0.001	0	0.004	0.019*
White Irish.(LSOA_WB_density-gm)	-0.006	0.006	-0.018	0.005	0.263
White (other).(LSOA_WB_density-gm)	-0.006	0.003	-0.011	0	0.035*
White and Black Caribbean.(LSOA_WB_density-gm)	0.006	0.007	-0.007	0.02	0.336
White and Black African.(LSOA_WB_density-gm)	-0.018	0.011	-0.04	0.004	0.113
White and Asian.(LSOA_WB_density-gm)	0.005	0.009	-0.012	0.023	0.543

Mixed (other).(LSOA_WB_density-gm)	0.004	0.006	-0.009	0.016	0.567
Indian.(LSOA_WB_density-gm)	0.001	0.005	-0.009	0.012	0.781
Pakistani.(LSOA_WB_density-gm)	0.004	0.005	-0.005	0.013	0.378
Bangladeshi.(LSOA_WB_density-gm)	0.003	0.009	-0.014	0.019	0.767
Asian (other).(LSOA_WB_density-gm)	-0.01	0.006	-0.021	0.002	0.100
Black Caribbean.(LSOA_WB_density-gm)	0.009	0.006	-0.002	0.02	0.104
Black African.(LSOA_WB_density-gm)	-0.004	0.006	-0.015	0.007	0.510
Black (other).(LSOA_WB_density-gm)	0.018	0.009	0.001	0.035	0.036*
Chinese.(LSOA_WB_density-gm)	-0.006	0.013	-0.031	0.018	0.625
Other.(LSOA_WB_density-gm)	-0.018	0.006	-0.029	-0.007	0.002*

Covariance parameters

Effects	**Variance**	**SE**	***p***	**ICC**
Residual effect (patient)	30.351	0.131	<0.001*	
Random effect (neighbourhood)	0.180	0.026	<0.001*	0.006

B = regression coefficient; SE = standard error; CI = 95% confidence intervals; ICC = intraclass correlation coefficient; mc = mean centred;

PHQ-9 = patient health questionnaire (depression); GAD-7 = generalized anxiety disorder (anxiety);
WSAS = work and social adjustment scale; ethnicity-related variables highlighted in green replicated in both Tables 2 and 3, whereas those highlighted in yellow were only significant in this Table (e.g., model)

-2 log likelihood = 685910.478

Table 3 above shows the results of models examining associations between pre-treatment variables and post-treatment anxiety (GAD-7) outcomes. Statistically significant main effects were found for specific ethnic groups: *White (other), Mixed (other), Indian, Pakistani, Bangladeshi, Asian (other), Black (other)* and *Other*. This indicates that these patients had **higher than average** post-treatment anxiety scores (poorer treatment outcomes) in comparison to the *White British* group after controlling for baseline severity of anxiety, employment status and neighbourhood socioeconomic deprivation (IMD).

Statistically significant cross-level interactions between ethnicity and neighbourhood WB ethnic density were found for specific ethnic groups: *White (other)* and *Other* ethnic groups had **lower than average** post-treatment anxiety

scores if they were living in neighbourhoods with a higher level of WB density (LSOA WB density). However, the inverse pattern was observed for patients from a *Black (other)* ethnic group (see Figures 2 and 3), who had **higher than average** post-treatment anxiety scores if they were living in neighbourhoods with a higher level of WB density.

Overall, comparing the results for models examining variables associated with pre- and post-treatment anxiety, the most consistent pattern of findings (see coefficients highlighted in green) indicates that people from the following ethnic groups had more severe anxiety before and after treatment: *White (other), Indian, Pakistani, Bangladeshi, Asian (other)* and *Other*. The only consistently statistically significant cross-level interaction was for the White (other) ethnic group whose anxiety improved living in WB dense areas (see Figure 3).

Figure 2:

Post-treatment GAD-7 scatterplot for Black (other) group

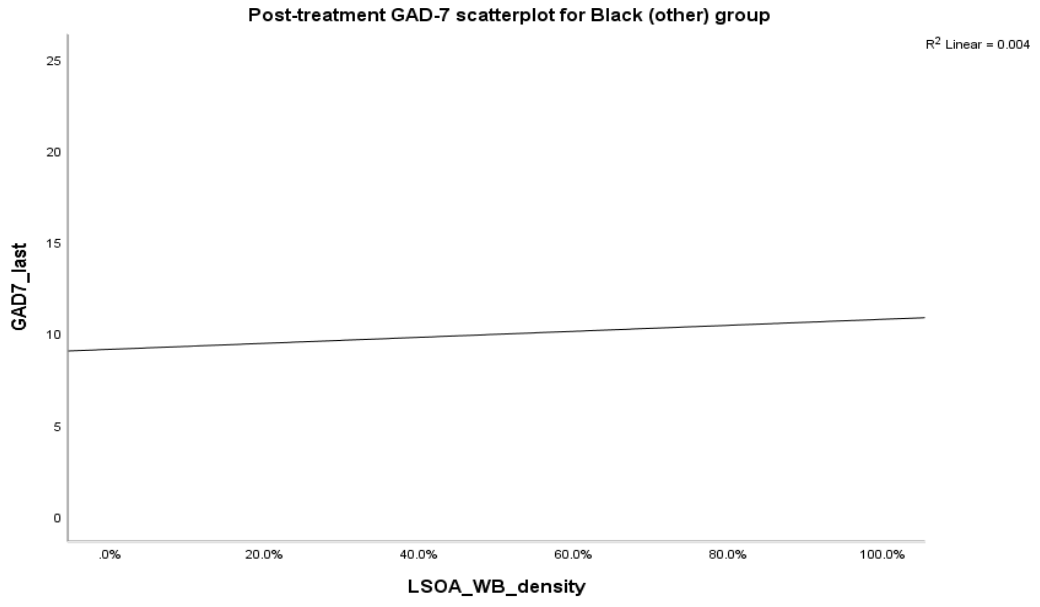
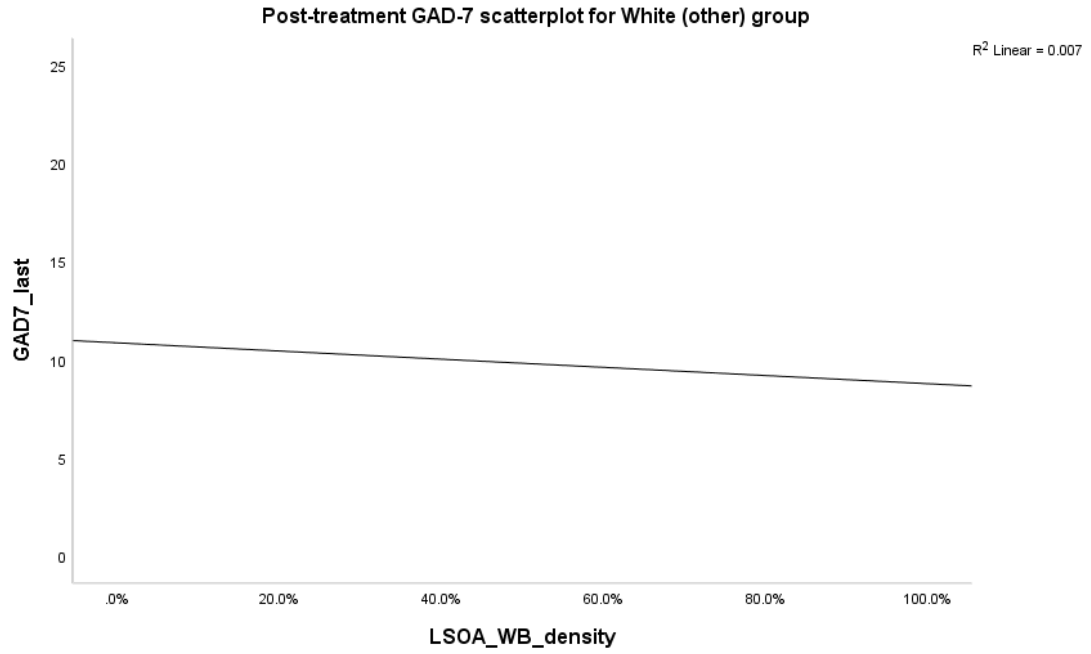


Figure 3:

Post-treatment GAD-7 scatterplot for White (other) group



Secondary outcome: Depression (PHQ-9)

Table 4 (Appendix A) shows statistically significant main effects for specific ethnic groups: *White (other), White and Asian, Indian, Pakistani, Bangladeshi, Asian (other), Black (other)* and *Other*. This indicates that these patients had **higher than average** pre-treatment depression scores in comparison to the *White British* group after controlling for employment status and neighbourhood socioeconomic deprivation (IMD).

Statistically significant cross-level interactions between ethnicity and neighbourhood WB ethnic density were found for specific ethnic groups: *White (other), Mixed (other), Indian, Pakistani, Bangladeshi,* and *Asian (other)*. Patients

from these ethnic groups had **lower than average** pre-treatment depression scores if they were living in neighbourhoods with a higher level of WB density.

The model also shows that unemployment was significantly associated with more severe pre-treatment depression, while the IMD score was inversely related to depression severity (people in more deprived neighbourhoods were more depressed).

Table 5 (Appendix B) shows the results of models examining associations between pre-treatment variables and post-treatment depression (PHQ-9) outcomes. Statistically significant main effects were found for specific ethnic groups: *White (other), Mixed other, Pakistani, Bangladeshi* and *Other.* This indicates that these patients had **higher than average** post-treatment depression scores (poorer treatment outcomes) in comparison to the *White British* group after controlling for baseline severity of depression, employment status and neighbourhood socioeconomic deprivation (IMD).

Statistically significant cross-level interactions between ethnicity and neighbourhood WB ethnic density were found for specific ethnic groups: *White (other), Asian (other)* and *Other* had **lower than average** post-treatment depression scores if they were living in neighbourhoods with a higher level of WB density. However, the inverse pattern was observed for patients from a *Black Caribbean* ethnic group, who had **higher than average** post-treatment depression scores if they were living in neighbourhoods with a higher level of WB density.

Overall, comparing the results for models examining variables associated with pre- and post-treatment depression, the most consistent pattern of findings indicates that people from the following ethnic groups had more severe depression before and

after treatment: *White (other), Pakistani, Bangladeshi (See Figure 4)* and *Other*. The only consistently statistically significant cross-level interaction was for the *White (other)* and *Asian (other)* ethnic groups.

Secondary outcome: Work and Social Adjustment Scale (WSAS)

Table 6 (Appendix C) shows statistically significant main effects for specific ethnic groups: *White Irish, White (other), White and Black Caribbean, White and Black African, Mixed (other), Indian, Pakistani, Bangladeshi, Asian (other), Black Caribbean, Black African, Black (other)* and *Other*. This indicates that these patients had **higher than average** pre-treatment impairment in functioning by comparison to the *White British* group after controlling for employment status and neighbourhood socioeconomic deprivation (IMD).

Statistically significant cross-level interactions between ethnicity and neighbourhood WB ethnic density were found for a specific ethnic group: *Indian*. Patients from this ethnic group had **higher than average** pre-treatment impaired functioning if they were living in neighbourhoods with a higher level of WB density.

The model also shows that unemployment was significantly associated with more severe pre-treatment impairment in functioning, while the IMD score was inversely related to severity in functioning (people in more deprived neighbourhoods had more impaired functioning).

Table 7 (Appendix D) shows the results of models examining associations between pre-treatment variables and post-treatment impairment in functioning (WSAS) outcomes. Statistically significant main effects were found for specific ethnic groups: *White (other), White and Asian, Mixed (other), Pakistani, Bangladeshi, Asian*

(other), Black (other) and *Other*. This indicates that these patients had **higher than average** post-treatment impairment in functioning (poorer treatment outcomes) in comparison to the *White British* group after controlling for baseline severity of impairment in functioning, employment status and neighbourhood socioeconomic deprivation (IMD). However, the inverse pattern was observed for patients from a White and Black African (mixed) ethnic group, who had **lower than average** post-treatment impairment in functioning scores in comparison to the *White British* group after controlling for baseline severity of impairment in functioning, employment status and neighbourhood socioeconomic deprivation (IMD).

Statistically significant cross-level interactions between ethnicity and neighbourhood WB ethnic density were found for a specific ethnic group: *White and Black African* ethnic group had **lower than average** post-treatment impairment in functioning scores if they were living in neighbourhoods with a higher level of WB density. However, the inverse pattern was observed for patients from a *Black Caribbean* ethnic group, who had **higher than average** post-treatment impairment in functioning scores if they were living in neighbourhoods with a higher level of WB density.

Overall, comparing the results for models examining variables associated with pre- and post-treatment impairment in functioning, the most consistent pattern of findings indicates that people from the following ethnic groups had more severe impairment in functioning before and after treatment: *White (other), White and Black African, Mixed (other), Pakistani, Bangladeshi, Asian (other), Black (other)* and *Other*. The only consistently statistically significant cross-level interaction was for the *White and Black African* ethnic group.

Discussion

The most consistent finding in this study was an association between specific ethnic groups and more severe anxiety, depression and functional impairment. Specifically, people from the following ethnic backgrounds showed consistently poorer mental health indicators before and/ or (Indian only significant before treatment in WSAS scores) after treatment: White (other), Indian, Pakistani, Bangladeshi, Asian (other) and Other. These main effects of ethnicity were statistically significant after controlling for individual (employment) and neighbourhood (IMD) socioeconomic variables. Overall, this finding points to a source of mental health inequalities for people from these ethnic backgrounds, an inequality that is not rectified or remedied after accessing evidence-based psychological interventions in IAPT services.

Contrary to our hypotheses, we found little consistent support for the minority stress effect in relation to neighbourhood ethnic density, for most of the ethnic groups represented in the study dataset. However, there was a consistent association between *Black (other)* and more severe anxiety**,** and *Black Caribbean* and more severe depression and functional impairment, indicating a minority stress effect for these ethnic groups specifically when living in WB-dense areas. Wider literature in the area of psychosis shows a similar pattern. Research has shown areas with low EM density have higher rates of psychosis in people from minority ethnic groups (Boydell et al., 2001; Halpern & Nazroo, 2000). Veling et al., (2008) found psychosis rates were not elevated when EM groups lived in neighbourhoods with a high proportion of people from their own ethnic background. Incident rate ratios amongst people from an African Caribbean background have been found to be higher than the WB population- 9.1 for schizophrenia; 8.0 for manic psychosis; 6.7

for all psychosis (Fearon et al., 2006). McIntyre et al., (2016) proposed a framework to explain elevated levels of psychosis amongst migrants. They propose that first-generation migrants, and their offspring may be at risk of social marginalisation and its associated stressors. They suggest this is exacerbated amongst the second generation who may feel disconnected to their family's culture and may not completely identify with their culture of birth, especially if subjected to the same prejudiced experiences by first generation migrants. McIntyre et al., (2016) refer to this second generation as being "trapped in a type of identity limbo that prevents them from reaping the mental health benefits that multiple social identities provide." McIntyre et al., (2016) suggest that people feeling socially isolated also feel socially excluded, and this can lead to building mistrust, increasing the likelihood that negative events will be attributed to malevolent others. Greenaway et al., (2015) have shown that social identification promotes an internal locus of control, trust in others, and can help to reduce paranoid ideation and to promote better mental health.

Sellers and Shelton (2003) in their study on the role of racial identity in perceived racial discrimination found that *racial centrality* (i.e., group identification based on race) was correlated with perceived racial discrimination. Their findings suggest it is the meaning one places on what it is to be a member of the group that protects individuals from negative consequences (Sellers & Shelton, 2003). They found that the more important being Black was to African Americans, the more racial discrimination they indicated to have experienced, whereas placing less importance on racial centrality reduced perceived discrimination (Sellers & Shelton, 2003). The implications of these studies are that they suggest Black people may feel more isolated and less in control when living in areas with a higher WB density. If they

identify more with being Black, they are more likely to experience being discriminated against. Such experiences and perceptions may be reinforced by overt signs of discrimination. For example, data published by NHS Digital, (2022) indicates that Black people were almost five times as likely as White people to be detained under the Mental Health Act in 2020/21 (344 detentions per 100,000 people compared with 75 per 100,000 White people). Black- other had the highest rates of detention 764 per 100,000 people, Black African 291 per 100,000 people and Black Caribbean 287 per 100,000 people.

Furthermore, findings regarding the *White (other)* group indicate that they seemed to be significantly more anxious and depressed if they lived in a more ethnically diverse area and less anxious in WB dense areas. Although this group may incorporate different ethnic groups, the Polish group is the largest Caucasian immigrant population in the UK (Maciagowska & Hanley, 2018). Prior to the EU Referendum, Poles were seen to be 'desirable' and labelled as 'invisible' due to their whiteness (Rzepnikowska, 2019), although in more recent years (i.e., the UK referendum leading to Brexit) eastern European people have faced more overt hostility fuelled by a perception that they may be overrepresented in working class occupations. From this viewpoint, it might be that *White (other)* people living in WB dense neighbourhoods may be living in more affluent areas and face less hostility, since people in more affluent neighbourhoods may be less concerned about job insecurity and precarity. Moreover, Polish national identity is understood to be constructed around notions of whiteness (Jaskulowski, 2021). People of colour in Poland have been reported to feel excluded from Polish society (Balogun and Joseph-Salisbury, 2021). Polish popular culture portrays Black people as uncivilised and inferior and Muslim people as dangerous and violent (Moskalewicz, 2005;

Zabek, 2007) and these views have been found amongst Polish people living in the UK (Mogilnicka, 2022). Living in EM dense areas, Polish people may therefore experience status anxiety. Status refers to the position of a group or individual within a social hierarchy (Marshall, 1998). A threat to this can create anxiety. Jensen (2006: 97) defines status anxiety as 'concerns about being devalued.'

The other groups that fall within the White- other group were the Gypsy, Roma and Traveller communities. However, this group is underrepresented in research and therefore not much is known about their needs. To address this issue, the NHS Race and Health Observatory (NHS RHO, 2022) have commissioned The University of Worcester to conduct research into the mental health needs of Gypsy, Roma and Traveller communities. This work is yet to be published.

Aside from the above instances where a minority stress effect may be relevant, the most clinically relevant finding in this study concerns the direct (e.g., main effect) associations between specific ethnicities and poor clinical outcomes. Aside from the "white other" and "other" groups, main effects were found for ethnic groups with a South Asian ancestry (Indian, Pakistani, Bangladeshi). Given that such main effects cannot be attributable to socioeconomic variables (which were controlled), it is plausible that other sociocultural factors may be at play in explaining this. One possibility is that the mental health of people from South Asian backgrounds may be affected by experiences of social exclusion and discrimination for religious and cultural reasons rather than ethnic reasons per se. For example, in a recent study Jaspal and Lopes (2021), found that Black participants reported more frequent ethnic discrimination than South Asians who reported more religious discrimination. In turn, it may be that these differences in world view or religious

affiliation could give people from ethnic minorities a more chronic and unrelenting sense of minority stress.

An alternative although related explanation is that people from South Asian backgrounds may not feel that health services / therapists fully appreciate or understand their cultural world view and values. There is an increasing recognition that psychological theory and practice is predominantly focused on individualistic values and perspectives, which may not necessarily accord with collectivist values and perspectives (e.g., see Pelham et al., 2022). As such, it may be that conventional evidence-based psychological interventions may not fit so well with the cultural and religious world view of communities that have an inclination towards collectivist values. This is one of the ideas that underlies the area of cultural adaptations of psychotherapy. Benish et al., (2011) found in their meta-analysis that culturally adapted CBT is more effective than unadapted therapy, as outcomes improve when the "illness myth" (i.e., patient's explanatory model for their illness) is adapted in a manner consistent with the patient's cultural worldviews. Pakistani and Bangladeshi communities will largely follow the Islamic faith. Mir et al., (2015) in their work on adapting Behavioural Activation (BA) for the treatment of depression in Muslims found patients appreciated therapists' professionalism and empathy more than having a shared religious identity with the therapist. Patients shared their anxieties about discussing their behaviours might reinforce negative stereotypes of Muslim communities and therefore they expected therapists to genuinely respect and accept that Islamic teachings could be helpful to patients (Mir et al., 2015). Another factor to consider is that white British therapists may feel less confident working with EM communities. Naz et al., (2019) developed a framework to encourage therapists

to develop their confidence by working with EM communities instead of avoiding this work for fear of getting it wrong.

Benish et al., (2011) discuss how cultural adaptations require therapists to work within the patient's context and through the process of cocreation can help to construct and reconstruct the illness in a culturally congruent manner using cultural metaphors, stories and symbols for example. They discussed the implication this has for training and practice. Soto et al., (2018) talk about therapists having cultural skills to engage and modify assessment and treatment to match the cultural needs of patients. They completed two meta-analyses exploring culturally adapted interventions. The first meta-analysis found cultural adaptations to treatments were typically more effective, however many of the studies did not provide specifics of the adaptations (Soto et al., 2018). The second meta-analysis on therapists' multicultural competence found clients perceptions of therapists' multicultural competence strongly predicted their engagement and treatment outcomes. However, therapists' self-reported cultural competence did not significantly correlate with treatment outcomes and therefore it is recommended that therapists actively seek to learn patients' perspectives (Soto et al., 2018). Naeem et al., (2019) talk about globalisation making countries more diverse and the inability to provide culturally adapted care leads to disparities in access and outcomes. Naeem et al., (2019) recommend therapists should explore the patient's opinion about spiritual and religious causes of symptoms as well as exploring stigma and racism. Isgandarova (2022) has written about belief in spiritual or jinn possession in the Muslim community being widespread, however this is rejected by modern psychiatry which sees this as "superstition." This view could affect the quality of treatment Pakistani and Bangladeshi communities receive. Many of those who claim to be possessed by

jinn's also meet the mental health diagnoses within the scope of the Diagnostic and Statistical Manual- 5 (DSM-5; Isgandarova, 2022). For example, Lim et al., (2015) found 66% of research participants were diagnosed with a psychiatric diagnosis. Awaad et al., (2021) found despite the stigma associated with suicide amongst Muslims, higher rates of suicide attempts were reported within the Muslim faith in comparison to other faiths, atheists and agnostics.

The wider socio-political climate may also impact on Muslim communities' mental health. In the year ending March 2022, the Home Office had recorded 8,730 religiously motivated hate crimes, an increase of 37% from the 2020/2021 figures of 6,383. 3,459 (42%) of the religious hate crime offences in 2021/22 were targeted against Muslims. Disproportionately being victims of religiously motivated hate crimes could impact on this religious groups identity and mental health. Furthermore, Samari et al., (2018) found Islamophobia (i.e., discrimination of Muslims was associated with worse mental health and also poor healthcare seeking behaviour. They found women in religious attire experienced more discrimination in healthcare settings (Samari et al., 2018).

The findings of this study and the literature above highlight difficulties in identifying contributing factors that could help explain why EM groups have poorer outcomes in mental health services as it seems each group may be contending with different issues that impact their mental health and subsequent care they receive. The findings of this study indicated the need for more nuanced research for different ethnic groups instead of having a reductionist view based on the assumption that all EM groups have the same world views and experiences.

Limitations

A breakdown in outcomes across services would have shown whether there are differences in outcomes for different EM communities across different services as some may be performing better than others. However, this was not viable due to the low prevalence of patients from all of the various EM groups examined in the study, and the focus on investigating cross-level interactions between ethnicity and neighbourhood ethnic density (which requires very large samples).

The measures used in this study i.e., GAD-7, PHQ-9 and WSAS are not the only measures used in IAPT services. IAPT services routinely use disorder specific measures for PTSD, social anxiety, Generalised Anxiety Disorder. Having access to these may have yielded more accurate information about improvements to disorder specific mental health difficulties. The analysis did not break down outcome results across steps 2 (LiCBT only) and 3 (LiCBT and/ or HiCBT) as this was not the aim of the study. In future research, it would be helpful to see if there are any differences in outcomes at both steps and even between different therapy models offered in IAPT services. The data does not include follow-up data and therefore it is difficult to stipulate whether gains in therapy were maintained after discharge.

This study did not look at outcomes for those requiring interpreters and asylum seekers and refugees. Due to the extra considerations required when working with these people and services not necessarily equipped to work with them, it could be that they have poorer outcomes in mental health services.

Implications for clinical practice and future research

This study was motivated by the goal to attain equity of treatment outcomes for all members of society, irrespective of race and ethnicity. The results of this study challenge current thinking about mental health outcomes of EM communities, however it does not provide a definitive explanation for this. This research highlights the importance of acquiring a more nuanced understanding of mental health outcomes for different EM communities in IAPT services. To do this it is important to collect 100% ethnicity data as recommended by the IAPT BAME Positive Practice Guide (Beck et al., 2019). It is also important for commissioners to ring-fence funding for research and service development, to develop translated and culturally sensitive materials to reflect their local communities and for services and therapists to take their time to learn about and develop relationships with their local EM communities and not treat them all as a homogenous group as so often is the case.

The term EM in this study was used as a collective term, however the NHS Race and Health Observatory (NHS RHO, 2021) has developed five principles to follow when talking and writing about race; be specific; no acronyms or initialisms; context; transparency; adaptability. Developing our understanding of individual EM groups will have implications for clinical practice, emphasising the need for cultural adaptations to improve outcomes once people from EM communities access treatment. As routine practice, therapists can start asking patients about how they self-identify, identify with others and their experiences of living in their areas including exploration of experiences of racism to help inform their assessment, formulation and treatment plans. Services and therapists may benefit from receiving additional training to help develop their confidence in working with EM communities and to receive ongoing support and scrutiny via key performance indicators to

ensure they are accountable to their local EM communities, NHS England and organisations such as the NHS Race and Health Observatory.

Conclusion

Further research is required to explore all of the above findings of this study. For example, with detention rates under the Mental Health Act so high for the Black groups, it is likely those accessing IAPT services may have had difficult experiences of being detained when unwell and this may require further exploration, including how this impacted on how they identified with WB people who may have detained them. Further research into religious and cultural factors and the impact of Islamophobia on Pakistani and Bangladeshi group's identity and mental health also needs to be considered further. Finally, it would be helpful to understand the factors that impact White Polish and Roma, Gypsy and Traveller groups' mental health.

A possible explanation for the variations in findings could be status anxiety. If the White British group have greater socioeconomic status in society, do those EM groups living in high White British dense areas also share the same status and this acts as a protective factor for better mental health? It is important to understand experiences of EM groups living in WB and ethnically dense areas and the impact these have on their identities and mental health.

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Appendices

Appendix A:

Table 4.

Case-mix adjusted multilevel model examining selected neighbourhood-level variables as predictors of pre-treatment depression (PHQ-9) severity

Fixed effects					
Patient-level variables	**B**	**SE**	**Ci-Low**	**Ci-high**	***p***
cons	15.363	0.023	15.318	15.409	< .001*
White Irish	-0.053	0.168	-0.382	0.276	0.752
White (other)	0.248	0.088	0.074	0.421	0.005*
White and Black Caribbean	0.220	0.223	-0.216	0.657	0.323
White and Black African	0.341	0.343	-0.332	1.014	0.321
White and Asian	0.543	0.270	0.014	1.073	0.044*
Mixed (other)	0.233	0.203	-0.165	0.631	0.252
Indian	0.646	0.205	0.245	1.047	0.002*
Pakistani	0.855	0.191	0.481	1.230	< .001*
Bangladeshi	0.785	0.368	0.063	1.507	0.033*
Asian (other)	0.680	0.223	0.243	1.117	0.002*
Black Caribbean	0.179	0.225	-0.261	0.620	0.425
Black African	0.245	0.217	-0.180	0.669	0.259
Black (other)	0.844	0.341	0.175	1.513	0.013*
Chinese	0.303	0.354	-0.391	0.997	0.393
Other	0.844	0.187	0.477	1.210	< .001*
Unemployed	2.832	0.036	2.762	2.902	< .001*
Neighbourhood-level variables					
(IMD_decile_2015-gm)	-0.226	0.007	-0.24	-0.212	< .001*
(LSOA_WB_density-gm)	0.014	0.001	0.012	0.016	< .001*
White Irish.(LSOA_WB_density-gm)	-0.008	0.005	-0.019	0.002	0.122
White (other).(LSOA_WB_density-gm)	-0.011	0.002	-0.016	-0.006	< .001*
White and Black Caribbean.(LSOA_WB_density-gm)	-0.010	0.006	-0.022	0.002	0.117
White and Black African.(LSOA_WB_density-gm)	-0.015	0.010	-0.035	0.005	0.142
White and Asian.(LSOA_WB_density-gm)	-0.012	0.008	-0.029	0.004	0.134

Mixed (other).(LSOA_WB_density-gm)	-0.014	0.006	-0.025	-0.003	0.016*
Indian.(LSOA_WB_density-gm)	-0.015	0.005	-0.025	-0.005	0.002*
Pakistani.(LSOA_WB_density-gm)	-0.010	0.004	-0.019	-0.001	0.022*
Bangladeshi.(LSOA_WB_density-gm)	-0.020	0.008	-0.036	-0.004	0.014*
Asian (other).(LSOA_WB_density-gm)	-0.019	0.006	-0.030	-0.008	< .001*
Black Caribbean.(LSOA_WB_density-gm)	-0.008	0.005	-0.019	0.002	0.116
Black African.(LSOA_WB_density-gm)	-0.011	0.005	-0.021	0	0.052
Black (other).(LSOA_WB_density-gm)	0.009	0.008	-0.008	0.025	0.299
Chinese.(LSOA_WB_density-gm)	-0.01	0.012	-0.034	0.013	0.377
Other.(LSOA_WB_density-gm)	-0.01	0.005	-0.02	0	0.056
Random Part					
Level: IMD_LSOA11CD					
Var(cons)	0.256	0.025			
Level: CaseID					
Var(cons)	28.885	0.119			
Units: IMD_LSOA11CD	4586				
Units: CaseID	120267				
Estimation:	IGLS				
-2*loglikelihood:	746697.227				

Covariance parameters

Effects	**Variance**	**SE**	***p***	**ICC**
Residual effect (patient)	28.885	0.119	<0.001*	
Random effect (neighbourhood)	0.256	0.025	<0.001*	0.009

B = regression coefficient; SE = standard error; CI = 95% confidence intervals; ICC = intraclass correlation coefficient; mc = mean centred;
PHQ-9 = patient health questionnaire (depression); GAD-7 = generalized anxiety disorder (anxiety); WSAS = work and social adjustment scale; -2 log likelihood = 746697.227

Appendix B

Table 5.

Case-mix adjusted multilevel model examining selected neighbourhood-level variables as predictors of post-treatment depression (PHQ-9) severity

Fixed effects					
Patient-level variables	**B**	**SE**	**Ci-Low**	**Ci-high**	***p***
cons	9.297	0.028	9.243	9.352	<0.001*
PHQ9_first	0.530	0.003	0.523	0.536	<0.001*
White Irish	0.056	0.200	-0.336	0.448	0.780
White (other)	0.237	0.111	0.020	0.454	0.032*
White and Black Caribbean	0.452	0.266	-0.070	0.974	0.090
White and Black African	-0.410	0.426	-1.245	0.426	0.336
White and Asian	0.481	0.327	-0.159	1.121	0.140
Mixed (other)	0.758	0.245	0.278	1.237	0.002*
Indian	0.157	0.244	-0.320	0.635	0.518
Pakistani	0.949	0.227	0.504	1.393	<0.001*
Bangladeshi	1.059	0.431	0.215	1.903	0.014*
Asian (other)	0.352	0.267	-0.172	0.876	0.188
Black Caribbean	0.368	0.263	-0.148	0.883	0.162
Black African	-0.295	0.253	-0.791	0.201	0.244
Black (other)	0.670	0.402	-0.118	1.459	0.096
Chinese	-0.660	0.444	-1.530	0.211	0.137
Other	0.522	0.229	0.072	0.971	0.023*
Unemployed	3.391	0.043	3.306	3.477	<0.001*
Neighbourhood-level variables					
(IMD_decile_2015-gm)	-0.121	0.008	-0.138	-0.104	<0.001*
(LSOA_WB_density-gm)	0.001	0.001	-0.001	0.003	0.330
White Irish.(LSOA_WB_density-gm)	0.001	0.006	-0.011	0.014	0.832
White (other).(LSOA_WB_density-gm)	-0.009	0.003	-0.015	-0.003	0.003*
White and Black Caribbean.(LSOA_WB_density-gm)	0.007	0.007	-0.008	0.021	0.373
White and Black African.(LSOA_WB_density-gm)	-0.018	0.013	-0.042	0.007	0.163
White and Asian.(LSOA_WB_density-gm)	0.010	0.010	-0.009	0.029	0.302

Mixed (other).(LSOA_WB_density-gm)	0.012	0.007	-0.001	0.026	0.072
Indian.(LSOA_WB_density-gm)	-0.001	0.006	-0.013	0.011	0.876
Pakistani.(LSOA_WB_density-gm)	0.002	0.005	-0.008	0.012	0.739
Bangladeshi.(LSOA_WB_density-gm)	0.002	0.010	-0.017	0.021	0.841
Asian (other).(LSOA_WB_density-gm)	-0.015	0.007	-0.028	-0.002	0.021*
Black Caribbean.(LSOA_WB_density-gm)	0.015	0.006	0.003	0.027	0.014*
Black African.(LSOA_WB_density-gm)	-0.007	0.006	-0.020	0.005	0.256
Black (other).(LSOA_WB_density-gm)	0.016	0.010	-0.003	0.035	0.104
Chinese.(LSOA_WB_density-gm)	-0.017	0.014	-0.045	0.010	0.211
Other.(LSOA_WB_density-gm)	-0.016	0.006	-0.028	-0.004	0.011*

Random Part		
Level: IMD_LSOA11CD		
Var(cons)	0.287	0.034
Level: CaseID		
Var(cons)	37.682	0.163
Units: IMD_LSOA11CD	4499	
Units: CaseID	109675	
Estimation:	IGLS	
-2*loglikelihood:	709998.296	

Covariance parameters

Effects	**Variance**	**SE**	***p***	**ICC**
Residual effect (patient)	37.682	0.163	<0.001*	

Random effect (neighbourhood)	0.287	0.034	<0.001*	0.00

B = regression coefficient; SE = standard error; CI = 95% confidence intervals; ICC = intraclass correlation coefficient; mc = mean centred;

PHQ-9 = patient health questionnaire (depression); GAD-7 = generalized anxiety disorder (anxiety);
WSAS = work and social adjustment scale;
-2 log likelihood = 709998.296

Appendix C

Table 6.

Case-mix adjusted multilevel model examining selected neighbourhood-level variables as predictors of pre-treatment impairment in functioning (WSAS) severity

Fixed Part					
Patient-level variables	**B**	**SE**	**Ci-Low**	**Ci-high**	***p***
cons	19.556	0.044	19.47	19.643	< .001*
White Irish	0.615	0.286	0.054	1.176	0.032*
White (other)	1.198	0.151	0.902	1.495	< .001*
White and Black Caribbean	0.821	0.379	0.077	1.564	0.030*
White and Black African	2.095	0.582	0.954	3.236	< .001*
White and Asian	0.855	0.46	-0.047	1.756	0.063
Mixed (other)	0.997	0.346	0.318	1.676	0.004*
Indian	2.175	0.349	1.492	2.858	< .001*
Pakistani	2.078	0.331	1.43	2.726	< .001*
Bangladeshi	2.038	0.634	0.796	3.28	0.001*
Asian (other)	1.23	0.384	0.477	1.983	0.001*
Black Caribbean	0.904	0.385	0.15	1.659	0.019*
Black African	1.533	0.369	0.809	2.258	< .001*
Black (other)	1.273	0.584	0.129	2.417	0.029*
Chinese	0.697	0.604	-0.488	1.881	0.249
Other	1.418	0.319	0.792	2.044	< .001*
Unemployed (2,4,6)	4.547	0.061	4.427	4.666	< .001*
Neighbourhood-level variables					
(IMD_decile_2015-gm)	-0.234	0.014	-0.262	-0.206	< .001*
(LSOA_WB_density-gm)	-0.011	0.002	-0.015	-0.008	< .001*
White Irish.(LSOA_WB_density-gm)	-0.018	0.009	-0.036	0	0.053
White (other).(LSOA_WB_density-gm)	0.006	0.004	-0.002	0.015	0.139
White and Black Caribbean.(LSOA_WB_density-gm)	-0.008	0.011	-0.03	0.013	0.433
White and Black African.(LSOA_WB_density-gm)	-0.002	0.018	-0.036	0.032	0.907
White and Asian.(LSOA_WB_density-gm)	-0.007	0.014	-0.034	0.021	0.643

Mixed (other).(LSOA_WB_density-gm)	-0.007	0.01	-0.026	0.013	0.514
Indian.(LSOA_WB_density-gm)	0.018	0.009	0.001	0.035	0.038*
Pakistani.(LSOA_WB_density-gm)	0.008	0.008	-0.007	0.023	0.316
Bangladeshi.(LSOA_WB_density-gm)	0.011	0.014	-0.017	0.038	0.438
Asian (other).(LSOA_WB_density-gm)	-0.008	0.009	-0.026	0.011	0.422
Black Caribbean.(LSOA_WB_density-gm)	-0.003	0.009	-0.021	0.014	0.706
Black African.(LSOA_WB_density-gm)	0.009	0.009	-0.009	0.027	0.330
Black (other).(LSOA_WB_density-gm)	0.006	0.014	-0.022	0.034	0.660
Chinese.(LSOA_WB_density-gm)	0.009	0.02	-0.03	0.048	0.656
Other.(LSOA_WB_density-gm)	0.008	0.009	-0.01	0.025	0.396

Random Part		
Level: IMD_LSOA11CD		
Var(cons)	1.807	0.104
Level: CaseID		
Var(cons)	82.584	0.343
Units: IMD_LSOA11CD	4573	
Units: CaseID	119368	
Estimation:	IGLS	
-2*loglikelihood:	867461.193	

Covariance parameters				
Effects	**Variance**	**SE**	***p***	**ICC**
Residual effect (patient)	82.584	0.343	<0.001*	
Random effect (neighbourhood)	1.807	<0.001*	0.021	

B = regression coefficient; SE = standard error; CI = 95% confidence intervals; ICC = intraclass correlation coefficient; mc = mean centred;
PHQ-9 = patient health questionnaire (depression); GAD-7 = generalized anxiety disorder (anxiety); WSAS = work and social adjustment scale;

-2 log likelihood = 867461.193

Appendix D

Table 7.

Case-mix adjusted multilevel model examining selected neighbourhood-level variables as predictors of post-treatment impairment in functioning (WSAS) severity

Fixed effects					
Patient-level variables	**B**	**SE**	**Ci-Low**	**Ci-high**	***P***
cons	12.95	0.042	12.868	13.032	< .001*
(WSAS_first-gm)	0.474	0.003	0.468	0.48	< .001*
White Irish	-0.198	0.3	-0.786	0.391	0.511
White (other)	0.543	0.165	0.22	0.867	0.001*
White and Black Caribbean	0.425	0.398	-0.354	1.204	0.285
White and Black African	-1.327	0.636	-2.574	-0.079	0.037*
White and Asian	1.441	0.487	0.486	2.396	0.003*
Mixed (other)	1.192	0.365	0.477	1.907	0.001*
Indian	0.236	0.363	-0.475	0.947	0.515
Pakistani	1.596	0.346	0.918	2.275	< .001*
Bangladeshi	1.305	0.653	0.025	2.585	0.046*
Asian (other)	0.963	0.407	0.164	1.761	0.018*
Black Caribbean	0.449	0.392	-0.319	1.217	0.252
Black African	-0.69	0.379	-1.432	0.052	0.068
Black (other)	1.218	0.599	0.043	2.392	0.042*
Chinese	0.436	0.662	-0.862	1.734	0.510
Other	0.908	0.346	0.231	1.585	0.009*
Unemployed (2,4,6)	5.156	0.065	5.029	5.283	< .001*
Neighbourhood-level variables					
(IMD_decile_2015-gm)	-0.108	0.013	-0.133	-0.082	< .001*
(LSOA_WB_density-gm)	-0.002	0.002	-0.005	0.001	0.267
White Irish.(LSOA_WB_density-gm)	-0.012	0.01	-0.031	0.007	0.206
White (other).(LSOA_WB_density-gm)	-0.004	0.004	-0.013	0.005	0.347
White and Black Caribbean.(LSOA_WB_density-gm)	0.021	0.011	-0.001	0.043	0.057
White and Black African.(LSOA_WB_density-gm)	-0.037	0.019	-0.074	0	0.047*

White and Asian.(LSOA_WB_density-gm)	0.019	0.015	-0.009	0.048	0.184
Mixed (other).(LSOA_WB_density-gm)	0.02	0.01	0	0.04	0.053
Indian.(LSOA_WB_density-gm)	-0.002	0.009	-0.019	0.015	0.834
Pakistani.(LSOA_WB_density-gm)	0.009	0.008	-0.006	0.025	0.233
Bangladeshi.(LSOA_WB_density-gm)	0.001	0.014	-0.028	0.029	0.962
Asian (other).(LSOA_WB_density-gm)	-0.009	0.01	-0.028	0.011	0.375
Black Caribbean.(LSOA_WB_density-gm)	0.021	0.009	0.003	0.039	0.025*
Black African.(LSOA_WB_density-gm)	-0.014	0.009	-0.033	0.004	0.133
Black (other).(LSOA_WB_density-gm)	0.018	0.014	-0.01	0.047	0.209
Chinese.(LSOA_WB_density-gm)	0.002	0.021	-0.039	0.043	0.932
Other.(LSOA_WB_density-gm)	-0.009	0.009	-0.028	0.009	0.329

Random Part		
Level: IMD_LSOA11CD		
Var(cons)	0.828	0.081
Level: CaseID		
Var(cons)	81.524	0.357
Units: IMD_LSOA11CD	4466	
Units: CaseID	107103	
Estimation:	IGLS	
-2*loglikelihood:	776201.085	

Covariance parameters				
Effects	**Variance**	**SE**	***p***	**ICC**
Residual effect (patient)	81.524	0.357	<0.001*	
Random effect (neighbourhood)	0.828	0.081	<0.001*	0.010*

B = regression coefficient; SE = standard error; CI = 95% confidence intervals; ICC = intraclass correlation coefficient; mc = mean centred;
PHQ-9 = patient health questionnaire (depression); GAD-7 = generalized anxiety disorder (anxiety);
WSAS = work and social adjustment scale;

-2 log likelihood = 776201.085