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Review

Increased social identification is linked with lower depressive and anxiety symptoms among ethnic minorities and migrants: A systematic review and meta-analysis

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ABSTRACT

Evidence suggests that social identities, which provide purpose and a sense of belonging to the social world, promote resilience against psychological strain and protect well-being. This is especially important in ethnic minorities, who experience exclusion and discrimination from the majority group, and in migrant populations where adverse experiences, such as prejudice, disconnection from previous identities and issues of integration into the host country, negatively impact well-being. Drawing from the social identity theory, a meta-analysis was conducted examining the influence of group memberships and sense of belonging on ethnic minority and migrant mental health (depression and anxiety). The final search on three databases (i.e., PubMed, PsycINFO, Web of Science) was conducted on August 9th, 2022, identifying 3236 citations before removing any duplicates within and between databases. Across the 74 studies that met the inclusion criteria for the meta-analysis, increased social identification (ethnic, national and other types of identification) was associated with low psychological symptoms. We found that social identification is protective against common psychological disorders but with small effect sizes for depression ($r = -0.09$, CI = [− 0.12; − 0.06]) and anxiety ($r = -0.08$, CI [− 0.12; − 0.03]). Results are discussed with regard to the role that social context plays on ethnic minority and migrant mental health and the importance of facilitating migrant integration with the host society after displacement.

1. Introduction

People have migrated throughout history, creating ethnically diverse communities across the world, with recent projections showing a future increase in ethnic minority groups (U.S. Census Bureau, P. D, 2019). Despite this trend, these minorities still face precarious socio-economic conditions and discrimination, which are consistent predictors of mental health disorders (e.g., Harris et al., 2006; Karlsen & Nazroo, 2002; Karlsen, Nazroo, McKenzie, Bhui, & Weich, 2005; Nazroo, 2003). Epidemiological research seeking to explore ethnic disparities in mental health disorders points to the complexity in this association. For instance, research suggests that ethnic minorities in England and in other European countries experience elevated rates of common mental disorders (Missinne & Bracke, 2012; Smith, Bhui, & Cipriani, 2020; Weich et al., 2004). Ethnic minority status has also been identified as a risk factor for psychotic disorders (Leaune et al., 2019; Tortelli et al., 2018). However, most studies conducted in the United States (US) produce contradictory results. For example, a large body of evidence shows that ethnic minorities in the US have a lower prevalence of psychiatric disorders, such as anxiety and major depression (Barnes & Bates, 2017; Barnes, Keyes, & Bates, 2013; Breslau et al., 2006; Breslau, Kendler, Su, Gaxiola-Aguilar, & Kessler, 2005; Harris, Edlund, & Larson, 2005; Himle, Baser, Taylor, Campbell, & Jackson, 2009; Williams et al., 2007). In the context of social stressors and mental health, these findings appear to contradict the social stress paradigm, which predicts that disadvantages, such as social status and discrimination, lead to mental health issues. Nonetheless, studies in the field, including the US, consistently indicate that mental health disorders tend to persist for longer in ethnic minorities (Breslau et al., 2005; Williams et al., 2007), which may be attributed to their lower use of mental health services (Harris et al., 2005; Wang et al., 2005; Wang et al., 2005).

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1.1. Migration and mental health

The literature on ethnic minorities with immigration status is more consistent, with findings globally indicating that this population is particularly vulnerable and has a greater likelihood of developing post-traumatic stress disorder (PTSD), major depression, anxiety, and non-affective psychosis (Bas-Sarmiento, Saucedo-Moreno, Fernández-Gutiérrez, & Poza-Méndez, 2017; Brandt et al., 2019; Close et al., 2016; Fazel, Wheeler, & Danesh, 2005; Porter & Haslam, 2005). These findings are particularly important as, in recent years, the number of people who have moved between distant geographical regions has reached its highest humanity has ever seen; in 2020, the number of people who lived in a country other than the one in which they were born reached over 280 million, and this number is expected to increase further in the future (United Nations Department of Economic and Social Affairs, P. D, 2020).

Because of the wide range of economic, social, political, cultural, and environmental factors that foster migration, any simple definition of a *migrant* risks being reductive. The International Organization for Migration (IOM) confirms that there is no universally accepted definition and describes that a migrant is someone who moved within or outside the state of birth regardless of legal status, the reason for migration, whether the movement is temporary or permanent or voluntary or involuntary (Sironi, Bauloz, & Emmanuel, 2019). In practice, there are numerous reasons why people leave their usual place of residence. Some migrate out of choice in search of work opportunities or education. However, others have been forced to flee their homes either internally or outside their state of residence for reasons such as natural or other environmental disasters or in response to armed conflict and violence. By the end of 2021, the number of forcibly displaced people reached 89.3 million worldwide, including 53.2 million people who have relocated within their own country. Of these, 27.1 million are refugees and 4.6 million are asylum seekers (The United Nations High Commissioner for Refugees, 2021), where, according to the 1951 Geneva Convention, a refugee is a person who is forced to flee a country due to a well-founded fear of persecution based on reasons, such as race, religion, political beliefs, nationality, or a membership to a particular social group and who is unable to seek protection from that country (Sironi et al., 2019); in contrast to a refugee, who has already received protection, an asylum seeker is someone who is only seeking this protection.

Because of this lack of consensus, scholars tend to use the term migrant inconsistently, and some authors have failed to provide a clear explanation of whom they consider to be migrants in their research. For example, Close et al. (2016), in a recent systematic review of the literature on the mental health of 1st generation migrants (those who have made the journey from one country to another, as opposed to their descendants in the second, third generation etc.), use the definition proposed by IOM. Yet, in a study conducted in Germany by Geschke, Mummendey, Kessler, and Funke (2010), a migrant was considered anyone with a culture other than German (in other words, migrant status was confounded with ethnic minority status), while, in a US study by Keller, Joscelyne, Granski, and Rosenfeld (2017), migrants were defined simply as individuals who had arrived at the US border from the Northern Triangle of Central America. In light of this lack of consensus, the current study draws from the IOM definition of a migrant as anyone who moves away from their usual place of residence regardless of legal status, the reason for migration and the length of stay.

Given the distressing events forcibly displaced people experience, research has established that forced migration is a strong risk factor for developing psychiatric disorders, with most reviews in this area exploring PTSD followed by depression and anxiety (Uphoff et al., 2020). For example, a meta-analysis of 56 studies conducted in five different regions, including Africa, Latin America, the Middle East, Asia, and Europe, showed that refugees and internally displaced people report worse mental health outcomes relative to non-refugee groups (Porter & Haslam, 2005). Furthermore, a systematic review indicated that refugees resettled in Western countries are more likely to be diagnosed with PTSD and major depression than the general population in those countries (Fazel et al., 2005). Similarly, a review exploring first-generation migrants, including refugees and asylum seekers who had relocated to high-income countries, such as the US, Canada, United Kingdom, Sweden, and Australia, reported significantly higher prevalence rates of PTSD, depression, and anxiety compared to the native population in the host country (Close et al., 2016). Therefore, a recent meta-analysis on refugees in Western host countries confirmed that the traumatic events migrants experience prior to migration have also been shown to be a risk factor for the development of nonaffective psychosis (Brandt et al., 2019). Nonetheless, while those who migrate under adverse circumstances such as refugees have an elevated risk of developing psychological disorders, migration itself poses a potential psychological threat. A systematic review by Bas-Sarmiento et al. (2017) demonstrated that migrant populations across the world, including those who migrate out of choice, experience an increased risk of psychopathology, such as depression, anxiety, and somatic disorders, compared to the native population.

Scholars have tried to identify which premigration and postmigration factors contribute to this effect. For example, migrants who have experienced traumatic events such as exposure to torture and violence, suffered injuries, forced to evacuate under dangerous conditions, witnessed fighting between armed forces and who have been separated from family or lost a family member, are at a great risk for developing mental health issues (Cantekin & Gençöz, 2017; Duraković-Belko, Kulenović, & Dapić, 2003; Kira, Shuwiekh, Rice, al Ibraheem, & Aljakoub, 2017; Lindencrona, Ekblad, & Hauff, 2008; Rasmussen et al., 2010). This extensive literature has been synthesized by several reviews which have demonstrated that, despite varying prevalence rates across studies, war-related traumatic experiences are consistently linked with elevated rates of PTSD, depression, and anxiety (Porter & Haslam, 2005; Steel et al., 2009). Moreover, the existing literature emphasizes the importance of the process of displacement, such as long and unsafe journeys, and of post-displacement experiences that may compound or alleviate migrant mental health outcomes. These challenges include lack of employment opportunities and poverty (Beiser & Hou, 2017; Bernardes et al., 2010; Papadopoulos, Lees, Lay, & Gebrehiwot, 2004; Porter & Haslam, 2005; Priebe et al., 2012; Rasmussen et al., 2010; Silove, Sinnerbrink, Field, Manicavasagar, & Steel, 1997); perceived interpersonal discrimination, such as verbal abuse and physical assault; as well as perceived institutional discrimination (Bernardes et al., 2010; Branscombe, Schmitt, & Harvey, 1999; Ellis, MacDonald, Lincoln, & Cabral, 2008; Karlsen et al., 2005; Karlsen & Nazroo, 2002); poor housing and living conditions (Bernardes et al., 2010; Papadopoulos et al., 2004; Porter & Haslam, 2005; Rasmussen et al., 2010; Steel et al., 2009); feelings of loss of cultural roots including unfamiliar environments, different values, traditions and beliefs, as well as language (Ager & Strang, 2004; Papadopoulos et al., 2004; Phillimore, 2011; Priebe et al., 2012); lack of safety and access to resources (Ager & Strang, 2004; Phillimore, 2011; Rasmussen et al., 2010); social isolation and lack of social support due to the loss of social networks (Norris, Aroian, & Nickerson, 2011; Papadopoulos et al., 2004; Priebe et al., 2012; Silove et al., 1997). An additional stressor for asylum seekers is their pending status, with research showing that prolonged time in detention centers has an adverse effect on migrant mental health (Keller et al., 2003; Steel et al., 2004).

1.2. Social identity and belonging

While research has identified numerous social, economic and cultural displacement factors that need to be addressed to improve psychological well-being in ethnic minorities and migrants, one important psychological factor has been overlooked – the need to belong. The sense of belonging to the social world is one of the fundamental psychological

needs (Baumeister & Leary, 1995), which enhances psychological well-being (Cruwys et al., 2013, 2014; Haslam, Jetten, Postmes, & Haslam, 2009). Hence, people's social connectedness predicts psychologically and physically healthier lives (Holt-Lunstad, Smith, & Layton, 2010). According to the social identity theory, a person's social identity can relate to any group that a person identifies as a psychologically meaningful description of the self (not just ethnic, cultural and national identity as focused on in this review, but also, for example, sexual identity, identification with school or neighborhood) which has resulted in studies in this research field using a variety of measures to assess social identification. While there is limited evidence on whether the different instruments measure the same concept, there is a growing body of evidence supporting the hypothesis that identification with groups has health benefits and is protective against a range of mental health issues in vulnerable populations (Jetten, Haslam, & Alexander Haslam, 2012). Within this context, evidence shows that increased social identification is a predictor of better mental health outcomes and coping strategies after major life transitions for stroke patients (Haslam et al., 2008), for people who suffered traumatic injuries (Jones et al., 2012), for people facing financial stress (Elahi et al., 2018), as well as for those who live in homeless shelters (Jetten et al., 2015).

While ethnic minorities and migrants have an increased likelihood of developing mental health issues (Brandt et al., 2019; Close et al., 2016; Weich et al., 2004), empirical evidence on the benefit of multiple social identities to ethnic minorities and migrants is scarce, with most research focusing on a single dimension of social identity. For example, literature indicates that ethnic identification plays a crucial role on ethnic minority mental health, predicting lower likelihood of developing a lifetime-psychiatric disorder, including depression and anxiety (Burnett-Zeigler, Bohnert, & Ilgen, 2013), as well as enhancing overall psychological well-being (Branscombe et al., 1999). Furthermore, research indicates that ethnic identification has a positive effect on perceived discrimination, buffering against the development of depressive symptoms for ethnic minorities (Ikram et al., 2016) and ethnic minorities with immigrant status (Thibeault, Stein, & Nelson-Gray, 2018). Other studies explored ethnic minority identification with their close environment, showing that a sense of belonging to a community protects from the development of depressive symptoms (Gonyea, Curley, Melekis, & Lee, 2018; Hill, 2009).

With regards to migrant social identities, a recent study explored group identification of Syrian refugees, demonstrating that increased Syrian identification derived from the sense of belonging to the Syrian community and the perseveration of this identity after migration was linked with lower levels of depression and anxiety (Çelebi, Verkuyten, & Bagci, 2017). Similarly, Smeekes, Verkuyten, Çelebi, Acartürk, and Onkun (2017) found that Syrian refugees belonging to multiple social groups before migration were more likely to maintain group memberships after migration, which in turn was linked with a decreased risk of depression and greater life satisfaction. Other scholars examined the role migrant identification with the host culture plays, suggesting that migrants' greater sense of belonging to the US culture is linked with decreased depressive and anxiety symptoms (Meca, Gonzales-Backen, Davis, Hassell, & Rodil, 2019; Tikhonov, Espinosa, Huynh, & Anglin, 2019).

Despite this growing support for the positive mental health benefits of social identity in minorities and migrants, the consistency of the findings and strength of this effect remain uncertain. We therefore conducted a meta-analysis of relevant studies, focusing on common mental disorders, hypothesizing that increased social identification would be linked with lower levels of common mental disorders. In addition, we sought to assess the influence of methodological and contextual factors that may account for variations across the studies.

2. Methodology

2.1. Data sources and search strategy

A protocol of the review was developed prior and published on the International Prospective Register of Systematic Reviews (PROSPERO), registration number CRD42019129184, available from https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42019129184.

This meta-analysis was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines (Moher, Liberati, Tetzlaff, Altman, & Altman, 2009; see Appendix A). To achieve the objectives of the current study, we systematically identified articles on three databases: PubMed, PsycINFO, and Web of Science. All available records from 1970 to 2021 were searched using the following keyword combinations: (*immigrant* OR *asylum seeker* OR *migrant* OR *refugee* OR *displaced person* OR *displaced people* OR *ethnic minorit** AND *identity* OR *group belonging* OR *group membership* OR *group identification* OR *social identification* OR *identification* OR *sense of belonging* AND *common mental disorders* OR *depress** OR *posttraumatic stress* OR *anxiety* OR *panic disorder* OR *obsessive-compulsive disorder*). The final search on all databases was conducted on August 9th, 2022.

2.2. Inclusion criteria

Studies were included if they: (i) were published in a peer-reviewed journal; (ii) used a quantitative design (e.g., cross-sectional, longitudinal); (iii) included participants 18 years of age or older; (iv) explored ethnic minorities and/or migrants (v) using any type of instrument to measure (whether culturally adapted or not, see supplementary materials Appendix C) at least one of the common mental disorders defined by the National Institute for Health and Care Excellence including depression, generalized anxiety, panic, obsessive-compulsive, posttraumatic stress and social anxiety disorders (National Institute for Health and Care Excellence, 2011); (vi) used any type of social identification measure, including culturally adapted and validated or self-developed, which assesses any dimension of a person's social identity (e.g., ethnic identity, national identity; see supplementary materials Appendix C); (vii) reported a quantitative finding of a direct association between social identity and common mental disorders.

2.3. Exclusion criteria

Studies were excluded if they: (i) used mixed methodology; (ii) drew the sample from a general population and then compared different groups in terms of ethnic background or migration status; (iii) did not report data separately for migrants or ethnic minorities; (iv) examined clinical samples.

2.4. Study selection

Following the conduct of the searches, K.B. reviewed all of the titles and/or abstracts of the studies and eliminated those studies that unambiguously failed to meet the inclusion criteria outlined above. A random selection of 229 (10%) of both the included and excluded studies was screened by the second researcher, V·C, who disagreed about 3 of the included studies (98.7% agreement equating to a kappa of 0.960, reflecting a prior decision to include studies for further examination if in doubt). After the initial screening, full-text articles were assessed for eligibility against the inclusion/exclusion criteria by K.B. A random selection of 48 (10%) of both the included and excluded studies were also examined by V.C.; of these, 40 were agreed to be excluded, 6 were included by both raters, and 2 were rejected by the second rater; hence there was agreement in 95,83% of papers, equating to a kappa of 0.833. The third author, R.B., was consulted for final agreement on the disputed papers.

2.5. Data extraction

K.B. extracted data from each study using a standardized form. The form included information on the title, author, publication year, study location, study design, study population characteristics, sample size, measurement instruments, the social identity dimension explored, and the association between social identity and common mental disorders. A random selection of 10% of the standardized forms was verified by V.C. Any discrepancies were resolved through discussion between researchers or by the third reviewer R.B.

2.6. Data coding

A coding manual was developed prior to data extraction by all researchers. Coding was done by the first researcher K.B. Data raising any questions was directly discussed with the second and third researchers to make the coding decision. Note that short-form or revised versions for both social identity and common mental disorders were coded under the same category as the original scales (see Appendix B for the full list of coded variables).

2.7. Assessment of methodological quality

There is no consensus on the assessment of methodological quality for observational studies (Sanderson, Tatt, & Higgins, 2007; Shamliyan, Kane, & Dickinson, 2010), especially for cross-sectional studies in migrant research due to sampling challenges and language barriers. Whilst there is no golden rule to quality assessment, research suggests that the included quality components should be specific to the research area (Shamliyan et al., 2010). For example, in research on refugee mental health, language is identified as an important criterion when assessing the methodological quality of studies (Fazel et al., 2005). The current study used a five-point quality appraisal scale from Bogic, Njoku, and Priebe (2015), which was developed according to key quality criteria identified in previous reviews in this research area. The first three components relate to the sample selection bias minimization, while the remaining two evaluate the assessment validity of the studies. A cumulative quality score was calculated for each study raging from 0 to 5. Lower quality studies received a score between 0 and 3, whereas high quality studies received 4 or 5. The following criteria were assessed:

1. The sampling
   a. The use of random or inclusive sampling (non-random = 0, random or inclusive = 1)
   b. The sample size if non-random sampling (<200 = 0, ≥200 = 1);
2. The sample representativeness, i.e., the sample frame was a true or close representation of the target population (not representative = 0, representative = 1);
3. The response rate (<60% or not mentioned at all = 0, ≥60% = 1);
4. The use of validated and reliable measurements (valid and reliable measure not used = 0, valid and reliable measure used = 1);
5. The language in which the survey was conducted (second language or through interpreter = 0, native language or participants were proficient in the assessment language = 1).

2.8. Analyses

The metric of choice for the current meta-analysis was Pearson's *r* because the majority of the included studies (86.7%) reported data in terms of bivariate correlations. Other statistical methods included regression and logistic regression analyses. Other statistical measures were converted to *r* based on the statistical information extracted from each study through the following procedures.

First, beta coefficients (β) ranging from −0.50 to 0.50 were transformed using the following formula (Peterson & Brown, 2005):

$$r = \beta + 0.5\lambda$$

where λ = 1 when β is nonnegative and λ = 0 when β is negative. Two studies reported results in terms of unstandardized β coefficients. Because studies did not provide sufficient information to convert data into Pearson's *r*, they were excluded from the meta-analysis (i.e., Cislo, Spence, & Gayman, 2010; Tummala-Narra et al., 2018).

Second, log odds ratios (*Log Odds Ratio*) were converted to the standardized mean difference *d* using the following formula (Cooper, Hedges, & Valentine, 2009):

$$d = LogOdds\ Ratio \times \frac{\sqrt{3}}{\pi}$$

which was then transformed from the standardized mean difference *d* to *r* using the following formula (Cooper et al., 2009):

$$r = \frac{d}{\sqrt{d^2 + a}}$$

For those studies that included multiple measures of social identity, thus reported multiple correlations, for example, between ethnic identity and depression as well as national identity and depression, the average of all relevant correlations was taken. In order to do so, first, all the relevant Pearson correlation coefficients *r* were transformed to Fisher's z using the following formula (Cooper et al., 2009):

$$r_z = 0.5 \times ln\frac{(1+r)}{(1-r)}$$

Then the average of Fisher's z values was taken and back-transformed to Pearson's *r* using the following formula (Cooper et al., 2009):

$$r = \frac{e^{2z} - 1}{e^{2z} + 1}$$

In one case, an analysis described as nonsignificant without any additional information was set to *r* = 0.00 (i.e., Tikhonov et al., 2019).

The converted effect size values were included in all statistical analyses below. Due to the considerable heterogeneity among the included studies in terms of sample characteristics and social identity dimensions explored, a random-effects model was used to estimate the magnitude of the effect across studies. Follow-up moderator analyses were conducted to investigate which potential participant characteristics (e.g., migration status, ethnic group) and methodological variables (e.g., social identity measure, sample size) account for heterogeneity, also applying the random-effects model. In addition, publication bias was assessed using the "trim-and-fill" method to estimate the number of potentially missing studies due to publication bias and to impute their values in the analysis to show the adjusted average effect size (Duval & Tweedie, 2000). Results of publication bias analyses were illustrated using the funnel plot; hence the "trim-and-fill" method assumes that studies in the funnel plot should be symmetrically distributed around the mean effect. All analyses within the current meta-analysis were conducted using the Comprehensive Meta-Analysis software version 3.

3. Results

3.1. Study selection

The search method initially identified 849 citations on PubMed, 531 citations on PsycINFO, and 1856 citations on Web of Science. After the removal of duplicates within and between the three databases, there were a total of 2293 citations. All titles and abstracts were read for the 2293 non-overlapping records, and those that unambiguously failed to meet inclusion criteria were eliminated. A total of 481 articles were eligible for a full-text assessment. From them, 405 articles were excluded based on reasons outlined in Fig. 1. The review identified 76 citations

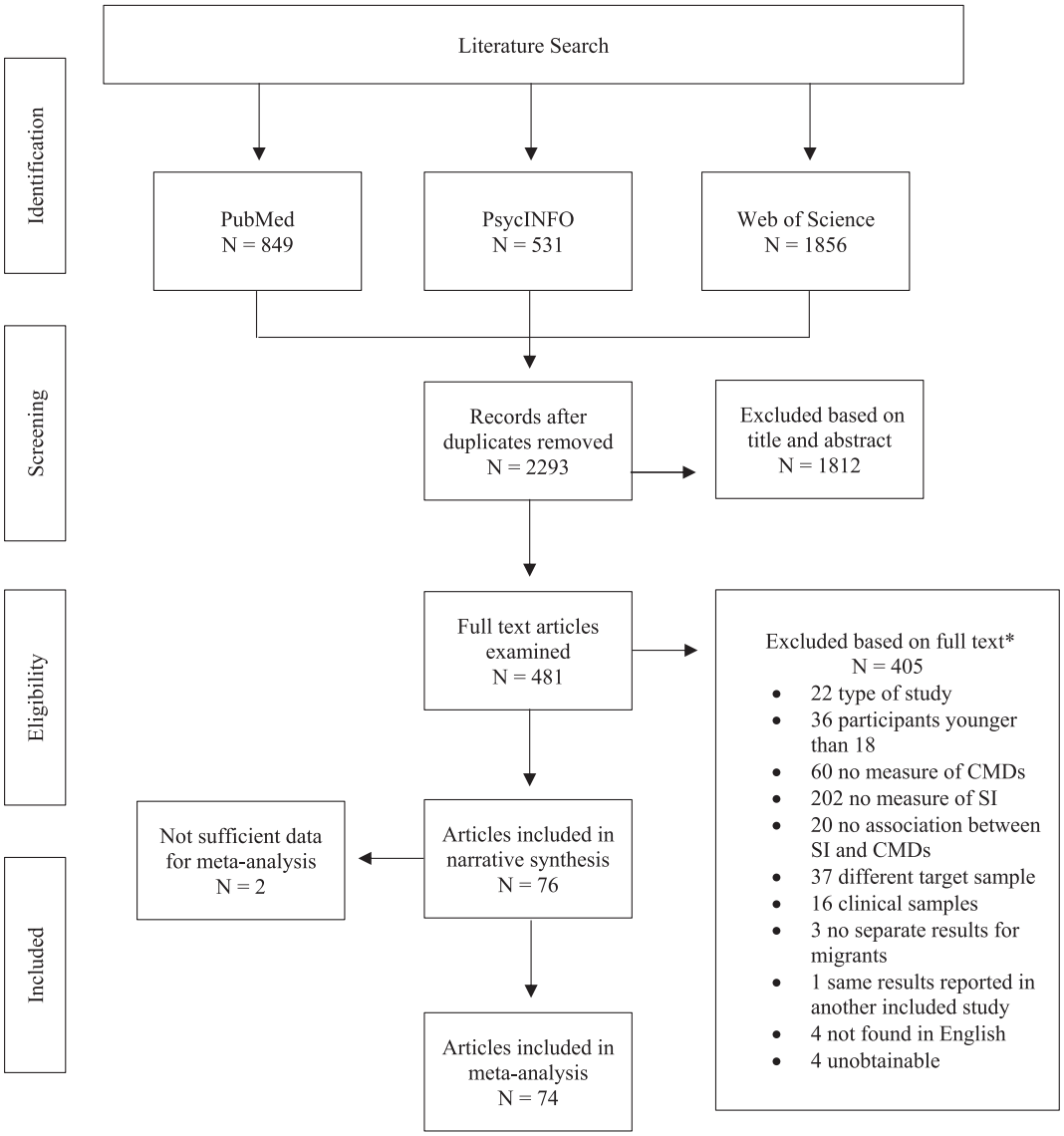

Fig. 1. PRISMA flowchart of article search strategy and screening process.
Note. *Some documents were excluded for multiple reasons, but only one reason was reported.

eligible for inclusion in the narrative synthesis. From them, two studies did not report sufficient data on their results to include in the meta-analysis. As a result, a total of 74 studies were included in the meta-analysis; from them, only three studies relating to PTSD were discovered, therefore this outcome was not considered further. The full search strategy is outlined in a flow diagram in Fig. 1.

3.2. Study characteristics[1]

In total, 75 studies contained 59,793 participants, ranging from 42 to 15,004 (median, 230) participants per study. The total number of females was 20,806 and 13,082 males; six studies (i.e., Ai, Appel, Lee, & Fincham, 2021; Carden, McDuffie, Murry, Bui, & Allen, 2021; Ghabrial & Andersen, 2021; Holttum, 2017; Monk, 2020; Perreira et al., 2015) did not provide any information on gender; a study by Lantrip et al. (2015) did not report descriptive statistics separately for ethnic minorities; and Tineo, Lowe, Reyes-Portillo, and Fuentes (2021) combined the percentage of females and transgender people, so descriptive statistics on gender from the study was included for males only. The average age of the participants across 69 studies was 28.46 years; six studies did not provide data on age (i.e., Braby, Holcomb, & Leonhard, 2022; Ghabrial & Andersen, 2021; Kim & Rew, 1994; Lantrip et al., 2015; Perreira et al., 2015; Suh, Flores, & Wang, 2019). The ethnic/-racial compositions across the studies ($N = 74$) were diverse, with the majority of studies (28.33%) including a mix of ethnic backgrounds in the study, 25.68% of the studies specifically explored Asian/Asian Americans, and 21.62% of studies explored Hispanic/Latino(a) Americans; Ghabrial and Andersen (2021) did not provide data on ethnicity/race. Similarly, studies ($N = 75$) investigated people with diverse migration statuses: 38.67% of studies examined people with a mix of migration statuses, 33.33% of studies examined ethnic minorities, and 16% examined 1st generation immigrants. The majority of the studies (75) were published from 2003 onwards; 61 were undertaken in the US, three in Canada, one in both the US and Canada, two in Turkey, two in Chile, one in Egypt, one in Korea, one in Italy, one in Israel, one in China and one in Greece. The most studied dimension of social identity across the included studies was ethnic identity, followed by identification with

[1] Two studies (i.e., Christophe et al., 2021 and Christophe et al., 2022) used the same data set, so participant characteristics and study location are reported for one study only to avoid any duplications in descriptive statistics.

the host culture and national identity. Accordingly, the most frequently used scale for social identity was the Multi-Ethnic Identity Measure (MEIM; Phinney, 1992), followed by the Ethnic Identity Scale (EIS; Umaña-Taylor, Yazedjian, & Bámaca-Gómez, 2004) and the identity subscale of the Collective Self-Esteem Scale (CSES; Luhtanen & Crocker, 1992). In terms of the common mental disorders assessed in each study, 43 studies examined depression, 26 studies explored both depression and anxiety, four studies explored anxiety, one study examined PTSD, one study examined both depression and PTSD, and one study examined depression, anxiety and PTSD. The most frequently used scale to assess common mental disorders was the Center for Epidemiology Studies – Depression (CES—D; Radloff, 1977), followed by the State-Trait Anxiety

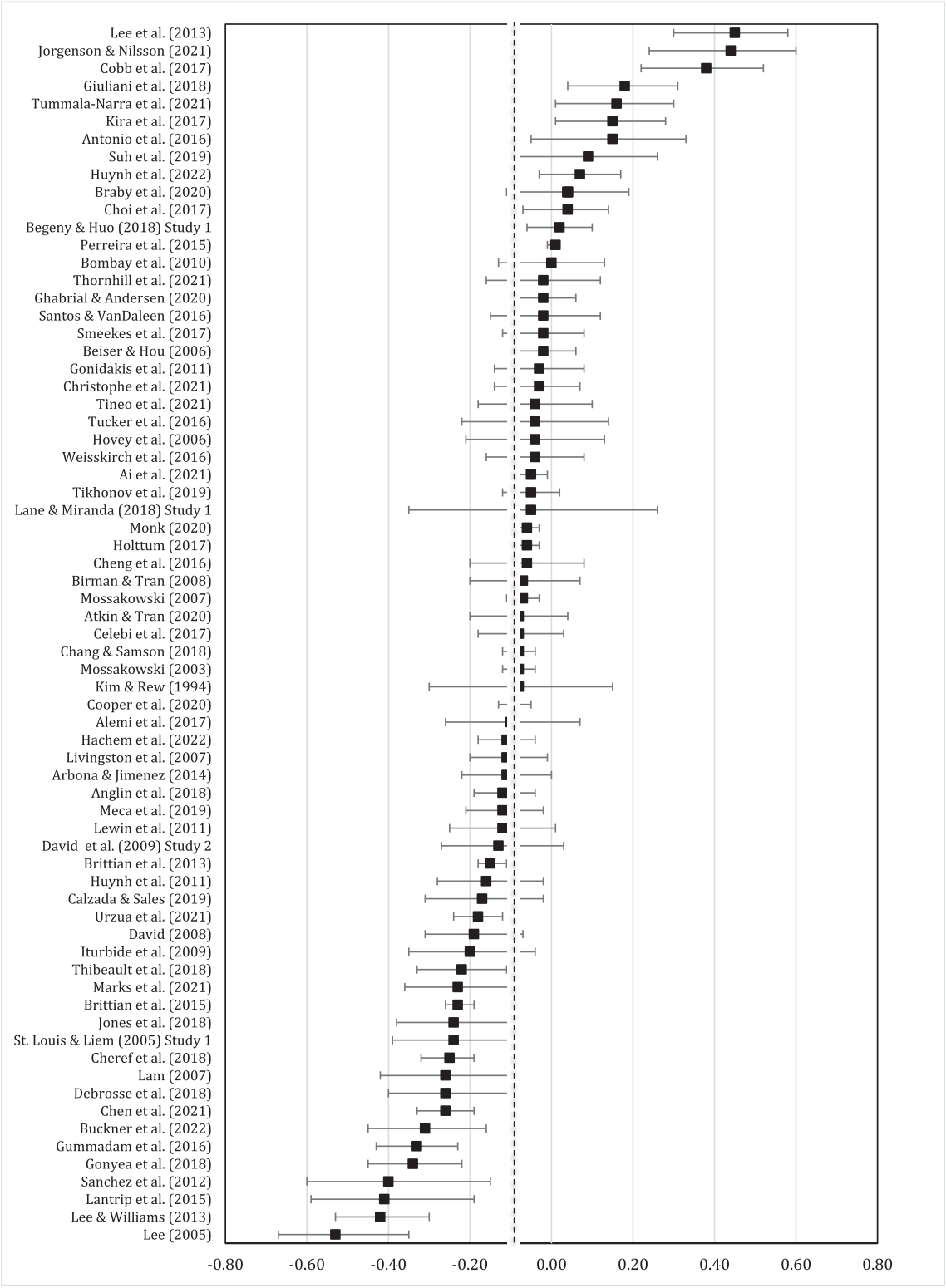

Fig. 2. Depression effect size by study.
Note. Effect size in Person's *r*; error bars indicate 95% confidence intervals. The dashed line indicates the average weighted effect size.

Inventory (STAI; Bieling, Antony, & Swinson, 1998) and Beck's Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). Appendix C demonstrates full descriptive information of the included studies.

3.3. Quality assessment

The current review identified 27 studies with high methodological quality, and the remaining 49 studies were considered to be of lower quality. In terms of sampling methods, 17 studies applied random sampling methods. Of the rest of the 59 studies that applied non-probability sampling methods, 36 studies included a sample size over 200. Of the included studies, 22% ($N = 17$) reported response rates above 60%. However, response rates were not reported for the remaining 59 studies. In total, the current review identified 65 studies which used valid and reliable instruments. Lastly, in terms of language, 63 studies assessed participants in their native language or participants were proficient in the assessment language (e.g., college students), in five studies, the assessment was not available in the native language, and eight studies did not report the language of assessment. Appendix D presents quality assessments for each study.

3.4. Social identity and depression

Across 69 studies, the random effects weighted average effect size $r = -0.09$ (95% CI = − 0.12 to - 0.06; see Fig. 2 for an effect size by each study). Results indicate a small negative relationship between social identity and depression according to Cohen's criteria for effect sizes (1992). Analysis indicated significant heterogeneity among the studies ($Q(68) = 551.36$, $p < .01$): 88% of the variance in effect size point estimates was due to heterogeneity rather than sampling error ($I^2 = 87.67$). Additional analyses were conducted in order to determine the degree to which of the proposed moderator variables for participant characteristics and study methodological characteristics moderated the variability in effect size (see Appendix B).

3.5. Participant characteristics

A table of the effects of participant characteristic moderators are summarized in Appendix E. Results suggest that the heterogeneity in results cannot be explained by the different migration statuses of the participants studied ($r = -0.06$, $p = .15$). Similarly, differentiation between student and non-student sample did not explain a significant account of variance ($r = -0.09$, $p = .15$). However, results suggest that the heterogeneity can be accounted for by the different ethnic groups studied ($r = -0.09$, $p < .01$). Thus, studies that explored African/African American ($r = -0.11$, $p < .05$, CI [− 0.18; − 0.02]), Asian/Asian American ($r = -0.13$, $p < .01$, CI [− 0.18; − 0.08]), Hispanic/Latin ($r = -0.09$, $p < .01$, CI [− 0.15; − 0.03]) sample, as well as those studies that included participants from diverse ethnic backgrounds ($r = -0.10$, $p < .01$, CI [− 0.16; − 0.05]) report a significant and negative relationship between social identity and depression compared to studies exploring Middle Eastern sample and other groups.

3.6. Methodological characteristics

For the summary of the methodological characteristic moderators, see Appendix F. Results suggest that the heterogeneity among the studies cannot be explained by the specific dimension of the identity explored in each study ($r = -0.05$, $p = .33$). However, several methodological characteristics were associated with the overall effect size between social identity and depression. Results suggest that the heterogeneity can be accounted for by the measure of social identification used ($r = -0.14$, $p < .01$). All moderator categories yielded significant and negative results with studies using CSES ($r = -0.21$, $p < .01$, CI [− 0.31; − 0.11]) and the identity scale of EIS ($r = -0.21$, $p < .01$, CI [− 0.30; − 0.12]) reporting greater effect sizes. Similarly, heterogeneity can be accounted for by the depression measure used ($r = -0.09$, $p < .05$). Studies using BDI ($r = -0.22$, $p < .01$, CI [− 0.31; − 0.12]), CES-D ($r = -0.12$, $p < .01$, CI [− 0.15; −0.08]) and other instruments ($r = -0.07$, $p < .05$, CI [− 0.13; −0.01]) reported significant and negative correlations. The study location is another significant moderator ($r = -0.08$, $p < .01$), with studies conducted in North America reporting significant and negative associations ($r = -0.10$, $p < .01$, CI [− 0.13; −0.07]) but not studies conducted in other countries ($r = -0.04$, $p = .35$). In addition, three moderators from the study quality assessment criteria explained a significant account of variance. First, the sample size was a significant moderator ($r = -0.09$, $p < .01$) with studies of 200 participants and more ($r = -0.10$, $p < .01$, CI [− 0.13; − 0.07]) and studies with <200 participants ($r = -0.06$, $p < .05$, CI [− 0.12; −0.01]) having significant weighted effects. Second, the sampling method was a significant moderator ($r = -0.09$, $p < .01$) with both studies using non-random ($r = -0.10$, $p < .01$, CI [− 0.13; − 0.07]), and random sampling method ($r = -0.07$, $p < .01$, CI [− 0.12; −0.02]) having significant weighted effect sizes. Lastly, the language of assessment explained a significant account of variance in results ($r = -0.09$, $p < .01$). Both studies that did not report the language of assessment ($r = -0.10$, $p < .05$, CI [− 0.18; − 0.02]) and studies which assessed participants in their native language ($r = -0.09$, $p < .01$, CI [− 0.12; − 0.06]) found significant effects.

3.7. Social identity and anxiety

Across 30 studies, the random effects weighted average effect size $r = -0.08$ (95% CI, − 0.12; − 0.03; see Appendix G for an effect size by each study), indicating a small negative relationship between social identity and anxiety (Cohen, 1992). There was significant heterogeneity among the studies ($Q(29) = 409.58$, $p < .01$), accounting for 93% of the variance in effect size, suggesting that the systematic effect size variability was greater than expected from sampling error alone ($I^2 = 92.92$). Moderator analyses demonstrated that whether the study was conducted with a student sample explained the variability across studies ($r = -0.08$, $p < .05$). Studies with student samples having significant weighted effect sizes ($r = -0.12$, $p < .01$, CI [− 0.18; − 0.06]) but not for studies with non-student samples ($r = -0.05$, $p = .11$). Results suggest that social identity measure explains variability across studies ($r = -0.10$, $p < .05$), with studies using CSES ($r = -0.27$, $p < .01$, CI [− 0.36; − 0.09]) and MEIM ($r = -0.09$, $p < .05$, CI [− 0.16; − 0.02]) yielding significant and negative effect sizes. The sample size can also be accounted for the heterogeneity ($r = -0.08$, $p < .01$), with studies of 200 participants and more ($r = -0.07$, $p < .01$, CI [− 0.12; − 0.02]) having a significant weighted effect size but not for studies with <200 participants ($r = -0.13$, $p = .06$). Lastly, the sampling method was a significant moderator ($r = -0.09$, $p < .01$) with studies using non-random having significant weighted effect sizes ($r = -0.08$, $p = .10$) but not for studies using random sampling method ($r = -0.07$, $p < .01$, CI [− 0.12; −0.02]). Whereas results suggest that anxiety measure ($r = -0.07$, $p = .10$) and study location ($r = -0.11$, $p = .07$) are not significant moderators. A summary of the participant and methodological characteristic moderators is outlined in Appendix H. We did not explore other moderator variables, such as ethnic/racial background, migration status, the dimension of identity explored and the assessment language, due to the insufficient number of studies in the coded categories (see Appendix I).

3.8. Publication bias analysis

Results of a meta-analysis can be significantly impacted by publication bias (Duval & Tweedie, 2000), usually because of the inclusion of only published studies rather than unpublished studies, which was the approach taken in the current meta-analysis, and because studies with significant results are more likely to be published. The "trim-and-fill"

method showed that there were no missing studies for depression analysis, demonstrating the same random effects weighted average effects size $r_z = -0.09$ (95% CI = − 0.12 to - 0.06). On the other hand, results demonstrated asymmetry in anxiety results, suggesting that studies appear to be missing on the left side of the funnel plot. This influences the central estimation of the association between social identity and anxiety and shows that studies are missing in the expected direction. The "trim-and-fill" method imputed two values to simulate the unpublished studies, and after re-calculation, the overall effect size increased $r_z = -0.09$ (95% CI, − 0.14; − 0.05). As a result, results of the current meta-analyses are robust and suggested that increased social identification is linked with decreased depression and anxiety.

3.9. Sensitivity analysis (social identity and depression)

The current review identified seven outlier studies with results that deviated from the majority of the included studies (i.e., Antonio et al., 2016; Cobb, Xie, Meca, & Schwartz, 2017; Giuliani, Tagliabue, & Regalia, 2018; Jorgenson & Nilsson, 2021; Kira et al., 2017; Lee, Donlan, Cardoso, & Paz, 2013; Tummala-Narra et al., 2021). The studies were considered outliers because they did not confirm previous findings on the beneficial role social identity plays on mental health (e.g., Çelebi et al., 2017; Livingston, Neita, Riviere, & Livingston, 2007; Meca et al., 2019) and reported opposite results indicating that social identification is linked with increased levels of depressive symptoms. Removing these studies from the meta-analysis, the random effects weighted average effect size slightly increased $r = -0.12$ (95% CI [− 0.14, − 0.09) across 62 studies, confirming a small negative relationship between social identity and depression according to Cohen's (1992) criteria.

More specifically, the contradictory results found by Lee et al. (2013) may be attributed to the twofold discrimination indigenous Mexicans experience in the US from the majority (Pérez, Fortuna, & Alegría, 2008), as well as the mainstream Mexican culture due to their lack of integration in both societies (Kearney, 2000). Similarly, ethnic identification may be a risk factor for undocumented Latino migrants in the US due to the widespread negative portrayal of this particular migrant group in American society (Cobb et al., 2017). On the same note, Tummala-Narra et al. (2021) suggested that ethnic identity may be a risk factor for Chinese Americans attending predominantly White universities. The contradictory results reported by Antonio et al. (2016) and Giuliani et al. (2018) may be explained due to the potentially increased negative social contact these particular native-born populations (Native Hawaiians and 2nd migrants from non-Western countries in Italy, respectively) encounter with the majority, which has been previously found to negatively affect psychological well-being (McIntyre, Elahi, Barlow, White, & Bentall, 2019). Kira et al. (2017) demonstrated that collective Syrian identification is linked with depressive symptoms. However, results from this study can be attributed to the identity measure used, which explored the centrality of Syrian identity in relation to the level of perceived identity threat. Lastly, Jorgenson and Nilsson (2021) demonstrated that refugee identification with the mainstream culture is associated with increased depressive symptoms. Because their sample also included recently resettled refugees, it is possible that identification with the mainstream culture may not have happened in meaningful ways, which has the potential to enhance mental health. It may rather reflect the initial excitement and hope through the idealized notion of the "American dream". Following the review of each study, we suggest that the negative relationship between social identity and depression is reliable in our meta-analysis, and the deviation in findings of the above-mentioned studies is rather due to confounding factors.

4. Discussion

The current study examined the overall magnitude of the association between social identity and psychological symptoms (i.e., depression and anxiety) in ethnic minority and migrant populations, demonstrating a small negative relationship between these two constructs, which supports previous findings in this research area (Cheref, Talavera, & Walker, 2019; Debrosse, Rossignac-Milon, & Taylor, 2018; Postmes, Wichmann, van Valkengoed, & van der Hoef, 2018; Smith & Silva, 2011; Williams, Chapman, Wong, & Turkheimer, 2012). However, a high degree of variation was observed across studies. Although a small negative relationship was observed, this effect was not consistent across the included studies.

A comment about the magnitude of the effect is warranted. Although it is tempting to interpret this finding as indicating that social identity is an unimportant issue when considering the mental health of migrants, we think this would be a false conclusion for several reasons. First, a small effect across a large population could potentially amount to a large increased burden of mental ill-health. Second, social identity likely interacts with many other factors linked to ethnic minority status and migration (e.g., traumatization, time since relocation or socioeconomic status), but it has not been possible to consider these interactions in this review, which has focused on the main effect of identity. For example, if social identity confers a protective effect, as theorized by many scholars (e.g., Ikram et al., 2016; Thibeault et al., 2018), its effect is most likely to be seen in those minorities and migrants who experience traumatic events related to discrimination or the circumstances of their movement from one place to another. In fact, evidence of these kinds of complex interactions, for example, between identity and discrimination, already exists in the literature (e.g., McIntyre et al., 2019). Finally, our study shows significant heterogeneity in the research findings, which suggests that some groups, in some situations, might benefit more from identity compared to others.

Several participant and methodological variables were considered as potential reasons for this heterogeneity. Two participant characteristics variables had no substantial influence: participant migration status and whether the study was conducted with students. Both of these findings might be considered surprising. Migrants experience substantial stress related to the causes of their migration and also the process of relocation, as reviewed in the introduction to this paper, whereas the same is not true for established minorities. On the other hand, students are likely to be advantaged, at least in terms of education and intelligence.

The examined dimension of social identity was not a significant moderator, which might also be considered surprising given that some studies examined identification with the minority ethnic group and others examined identification with the host culture. It is certainly possible that any kind of social identity confers protection against mental ill-health, as implied by the 'social cure' hypothesis (Haslam, Jetten, Cruwys, Dingle, & Haslam, 2018). Alternatively, given that the majority of studies considered ethnic identity only, it is possible that there is at present insufficient data to judge which kind of identity is most protective.

However, variation across the studies could be explained by several factors. First, the ethnic group studied was important. In line with previous research (Brittian et al., 2015; Cheref et al., 2019), the association was stronger for African/African Americans and Asian/Asian Americans compared to other groups, suggesting that the positive influence of social identity on psychological well-being varies among ethnic groups. Second, studies with a larger sample size tend to have a greater magnitude of the average effect size compared to studies with a smaller sample size. Sample size is an important consideration when conducting quality research (Cohen, 1962, 1992) and, given that the association between social identity and depressive symptoms is apparently quite small, studies with larger sample sizes had a greater probability of detecting it. Third, social identity measures significantly moderated the results, with studies using the CSES and EIS finding the largest effect sizes. The CSES is a valid and reliable measure that has been widely used in empirical research examining ethnic minority and migrant social identification (e.g., Agirdag, Phalet, & van Houtte, 2015; Crocker, Luhtanen, Blaine, & Broadnax, 1994; Nesdale & Mak, 2003; Verkuyten, 2008), which captures social identity's multidimensionality by asking

participants to evaluate social group memberships in terms of four domains: the judgment of self-worth within the social groups, the judgment of the social groups' worth in relation to other groups, the judgment of how positively other people view the social groups, and the judgment of how meaningful the social group memberships are to self-worth. On the other hand, EIS explores ethnic identity as one of the dimensions of people's social identity. Although the scale has three components assessing person's exploration, resolution and affirmation of one's ethnic identity, due to the purposes of the present review, the current meta-analyses considered the affirmation component, which measures one's feelings towards ethnic identity. Yoon (2011) suggests that EIS is a "solid" measure for assessing minority populations, and it has also been shown to be a valid and reliable measure (Umaña-Taylor et al., 2004). Similarly, depression measures significantly moderated the results, with studies using the BDI having a substantially greater magnitude of average effect size compared to studies using other scales. The BDI is a valid, reliable and widely used instrument, which is available in numerous different languages and has shown to be an effective scale for assessing people with diverse backgrounds (Carmody, 2005; Sashidharan, Pawlow, & Pettibone, 2012; Whisman, Judd, Whiteford, & Gelhorn, 2013). Overall, considering that these measurement moderation analyses were significant, with the most commonly used and cross-culturally validated instruments producing greater effect sizes, we suggest that results from studies using self-developed instruments in particular should be interpreted with caution.

In addition, slightly stronger effect sizes were obtained from those studies that did not report the language of assessment. Although the majority of the included studies assessed participants in their native language or participants were proficient in the language of assessment (83%), it is difficult to speculate about and interpret these findings. The study location was another moderator of the association between social identity and depressive symptoms, with studies conducted in North America finding greater effect sizes. Lastly, studies which applied non-random sampling methods found greater effect sizes than those with random sampling; it is important to note that our quality coding required that studies which did not provide any information on the sampling method be assigned to the non-random sampling group. One possible interpretation of this effect is that non-random sampling leads to a biased estimation of the magnitude of the effect.

Due to the uneven distribution of studies in anxiety variable categories, the current review explored six anxiety moderators. In contrast to the findings from the depression analysis, whether or not studies were conducted with student participants moderated results, demonstrating that studies with student samples show stronger effects. Whilst the measure of anxiety and study location were not significant moderators, three other methodological variables explained variations across the studies. Firstly, in line with the results from depression analysis, the social identity measure was a significant moderator, with studies using the CSES finding substantially higher effect sizes. Secondly, studies with a larger sample size tend to have significant results with a greater magnitude of the average effect size compared to studies with a smaller sample size. Lastly, only studies applying a non-random sampling method produced a significant effect size. As mentioned previously, this should be interpreted with caution due to our coding requirements, in addition to the uneven distribution of studies in coding categories.

4.1. Strengths and limitations

To our knowledge, this is the first meta-analysis conducted to examine the association between social identity and psychological symptoms in ethnic minority and migrant populations. Our findings support the previous meta-analysis conducted on social identity and depression in the general population (Postmes et al., 2018) and contribute to the literature by providing additional evidence of its association with anxiety symptoms. Although considerable variability across the studies was found, the study identified several variables that partially accounted for the variations, suggesting that the results are robust and reliable. In addition, the "trim-and-fill" method further strengthens the findings, showing that depression results were not influenced by publication bias. Although some publication bias was found in anxiety results, findings suggest that correcting the bias would strengthen the association between social identity and anxiety. Nonetheless, the study has several limitations important to note. First, the current review mostly relied on correlational designs, thus no causal relationships between social identity and psychological symptoms can be drawn. Feeling depressed or anxious might also affect one's perception of social identities and sense of identification with social groups, so there might be mutual directions of influence. In addition, it is possible that confounding variables, for example, exposure to trauma, may influence both social identity and symptom levels, which were not controlled for in the current review. Secondly, the diversity of assessment instruments, particularly social identification measures, can be considered a limitation of the current review. However, excluding studies based on the instruments employed would result in the loss of a large amount of information. Since studies published in English were included in the present review, the findings may therefore underrepresent studies published in non-Western countries with more diverse populations in terms of ethnic background or migration statuses. Hence, this was evident in the current review in which 66 out of 76 studies were published in North America. Lastly, a limitation with regards to the review process should be noted as each phase of study selection and coding was performed by one researcher, with only a proportion of the papers being independently reviewed by the other authors at the title and abstract screening and final full text selection phases. However, acceptable inter-rater reliability was demonstrated.

4.2. Future research

The benefit of social identity on ethnic minority and migrant mental health has been overlooked until recently. Due to the complexity of social identity with its many dimensions, research in this field has started to expand only in recent years, and many questions still remain to be answered. While the current review identified an association between social identity and psychological symptoms (i.e., depression and anxiety), future research should explore the causal relationship between the two constructs. Given that depression and anxiety are characterized by social withdrawal and social isolation, these may prevent people from developing new group memberships and potentially lead to withdrawal from the existing social groups. On the other hand, decreased identification with social groups, and thus a lack of social support, may cause people to feel socially isolated, leading to worse psychological well-being.

Future researchers should further examine social identity as a potential protective factor during major life changes, such as immigration or perceived discrimination from the host culture, which has been weakly supported by previous research (Schmitt, Postmes, Branscombe, & Garcia, 2014). As already noted, it was striking that no moderating effect was observed in the present synthesis for the type of identity measured. However, as also noted above, the majority of research to date has focused on the positive influence that ethnic identity has on minority and migrant mental health (e.g., Burnett-Zeigler et al., 2013; Smith & Silva, 2011; Thibeault et al., 2018) and future research should consider the multidimensionality of identities and aim to explore how they are constructed by people experiencing migration. More attention needs to be given also to the extent to which different identity measures covary and address the same construct. Qualitative studies could contribute to this understanding by exploring how and why different aspects of social identity are constructed in migrants' and ethnic minorities' discourse and how they become incorporated as meaningful parts of their selves. Given that social identities are not fixed and that people leave and join new social groups over time, longitudinal studies would provide insight into how migrant social identities develop after

relocation and the influence they have on their mental health through the different stages of acculturation.

Building on the results from the current narrative review, three additional suggestions for future research were identified. It may be crucial for future studies to differentiate between 1st and 2nd generation migrants within the sample, which may be particularly important when exploring identification with the host culture. It could be argued that 2nd generation migrants are more likely to identify with the host culture since they are native-born and face increased social contact with the nationals of the country, whereas 1st generation migrants may have stronger ties with their culture of origin and may have a greater sense of connection with those social groups which were developed prior migration. Similarly, studies in the current review included diverse samples in terms of ethnic backgrounds, and the findings show that group identification and its influence on mental health may vary across cultures. Therefore, future research should aim to explore a wide range of populations. Lastly, the numbers of international migrants are on the rise across the world (United Nations Department of Economic and Social Affairs, P. D, 2020), yet the majority (87%) of the included studies were conducted in the US. Research in this field should be expanded geographically, with further exploration of social identity continuity as well as the development of new group membership, examining the role that different host cultures play in this process.

4.3. Clinical implications

Results of this research particularly speak to non-governmental organizations and social services providing resources to migrants, highlighting the important role they play in providing information on social activities within communities in order to encourage migrant social engagement in the host country and giving opportunities to join new social groups. Secondly, this research informs health practitioners and the important role they play in addressing social groups as a source of psychological well-being. Interventions to enhance social connectedness and memberships with groups have already been developed for individuals who suffer from common psychiatric disorders (Haslam, Cruwys, Haslam, Dingle, & Chang, 2016). These interventions might be adapted, and other strategies devised, to help migrants maintain the existing groups while helping them identify with and join new social groups within the host society. Consequently, it is suggested that interventions with an emphasis on building social identification may be an effective strategy to reduce both ethnic minority and migrant psychological burdens and particularly improve migrant psychological functioning during their resettlement and overall integration into societies.

4.4. Conclusion

In conclusion, our study suggests that social identification is linked with decreased depressive and anxiety symptoms with small effect sizes. While this effect was not consistent across the included studies, the study identified both participant and methodological characteristics that accounted for the variability. Research on social identities and their influence on psychological well-being is relatively new. However, the present review contributes to the recent efforts and suggests that social groups are a crucial source for enhancing ethnic minority and migrant mental health.

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Contributors

KB, VC, and RB contributed to the conceptualization,methodology, and Writing - review & editing. KB oversaw data curation, conducted Visualization and Analysis, and contributed to Writing - original draft. RB and VC supervised the overall process. All authors have approved the final manuscript.

Declaration of Competing Interest

The authors declare they have no conflict of interest.

Appendix A

Table A1
PRISMA checklist.

Section and topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	p.1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	–
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	p. 7
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	p. 7–8
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	p. 8–9
Information sources	6	Specify all databases, registers, websites, organizations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	p. 8
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	p. 8
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	p. 9
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	p. 9–10

(*continued on next page*)

Table A1 (*continued*)

Section and topic	Item #	Checklist item	Location where item is reported
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	p. 9–10
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	p. 9–10
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	p. 10–11
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	p. 11–13
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	p. 8–9
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	p. 11–12
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	p. 13–14 and p. 16
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	p. 12–13
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	p. 12–13
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	p. 22–23
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	p. 12–13
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	p. 21–22
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	p. 13–14
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	p. 14
Study characteristics	17	Cite each included study and present its characteristics.	Appendix B
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Appendix D
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	p. 18 and Appendix E, F, G, H
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	p. 17; p. 20–21
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	p. 17–21
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	p. 19–21
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	p. 22–23
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	p. 21–22
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	p. 22–23
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	p. 23–24
	23b	Discuss any limitations of the evidence included in the review.	p. 27–28
	23c	Discuss any limitations of the review processes used.	p. 28
	23d	Discuss implications of the results for practice, policy, and future research.	p. 29–31
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	p. 8
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	p. 8
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	–
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	–
Competing interests	26	Declare any competing interests of review authors.	–
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	–

Appendix B

Table B1
Coding categories of moderator variables.

Variables	Coding categories
Participant Characteristics	
Migration status	Ethnic minorities
	1st generation immigrants
	2nd generation or later immigrants
	Refugees
	Mix of immigration statuses
Ethnicity/race	African/African American
	Asian/Asian American
	Hispanic/Latin
	Middle Easterner
	Mix of ethnic backgrounds
	Other
Student status	Student
	Non-student
Methodological Characteristics	
Social Identity measure	EIS (Umaña-Taylor et al., 2004)
	CSES (Luhtanen & Crocker, 1992)
	MEIM (Phinney, 1992)
	Other
Depression measure	BDI (Beck et al., 1961)
	CES-D (Radloff, 1977)
	HSCL-25 (Derogatis et al., 1974)
	PHQ-9 (Kroenke & Spitzer, 2002)
	Other
Anxiety measure	BAI (Beck et al., 1988)
	GAD-7 (Spitzer et al., 2006)
	HSCL-25 (Derogatis et al., 1974)
	STAI (Bieling et al., 1998)
	other
Social identity dimensions	Collective identity
	Ethnic identity
	Identification with the host culture
	National identity
	Other
Research setting	North America
	other
Sample size	Under 200 participants
	Over 200 participants
Sampling method	Random
	Non-random
Language of assessment	Native
	Non-native
	Not reported

Note. Abbreviations: BAI, Beck Anxiety Inventory; BDI, Beck Depression Inventory; CES—D, Center for Epidemiological Studies Depression Scale; CSES, Collective Self-esteem Scale; EIS, Ethnic Identity Scale; GAD, Generalized Anxiety Disorder; HSCL, Hopkins Symptom Checklist; MEIM, Multi-Ethnic Identity Measure; PHQ, Patient Health Questionnaire.

Appendix C

Table C1
Descriptive information of the studies included in the narrative synthesis.

Author(s)	Location	Sample size	Student sample	Ethnicity/race	Migration status	Social identity measures	CMD measures
(Ai et al., 2021)	US	2095	no	Asians, Asian Americans	Ethnic minorities (including immigrants)	3-item racial and ethnic identity measure	WMH-CIDI* (depression & anxiety)
(Alemi et al., 2017)	US	133	no	Afghan Americans	1st and 2nd generation immigrants	LIB	PHQ-9*
(Anglin et al., 2018)	US	644	yes	Asians, Blacks, Hispanics, Other	Ethnic minorities (including immigrants)	MEIM	CES-D*

(*continued on next page*)

Table C1 (*continued*)

Author(s)	Location	Sample size	Student sample	Ethnicity/race	Migration status	Social identity measures	CMD measures
(Antonio et al., 2016)	US	104	no	Native Hawaiians	Ethnic minorities	Ethnic identity scale and identification with the mainstream culture scale (Kaholokula, Nacapoy, Grandinetti, & Chang, 2008)	CES-D*
(Arbona & Jimenez, 2014)	US	309	yes	Latinxs	Ethnic minorities (including immigrants)	MEIM	CES-D*
(Atkin & Tran, 2020)	US	276	yes	Asians, Asian Americans	Ethnic minorities (including immigrants)	MEIM	GAD-7*, K-6*
(Begeny & Huo, 2018)	US	1048	yes (581) no (467)	African Americans, Asians, Asian Americans Blacks, Hispanics, Latinxs	Ethnic minorities	The ethnic identity-centrality scale (Leach et al., 2008)	CES-D*, STAI*
(Beiser & Hou, 2006)	CA	647	no	Asians	Refugees	Self-developed ethnic identity scale	Depressive Affect Measure (Beiser & Fleming, 1986)
(Birman & Tran, 2008)	US	212	no	Vietnamese	Refugees	LIB	HSCL-25*
(Bombay et al., 2010)	CA	220	no	First Nations (Aboriginal Canadians)	Ethnic minorities	12-item social identification scale (Cameron, 2004)	BDI*
(Braby et al., 2020)	US	171	yes	African Americans	Ethnic minorities	MEIM	PHQ-9*
(Brittian et al., 2013)	US	3659	yes	African Americans, Asian Americans, Latinxs	Ethnic minorities	EIS	CES-D*, Self-developed anxiety scale from BAI and DSM-IV
(Brittian et al., 2015)	US	2315	yes	Blacks, Latinxs	Ethnic minorities (including immigrants)	EIS	CES-D*
Buckner et al., (2022)	US	155	Yes	African Americans, Blacks	Ethnic minorities	MEIM	IDAS*
(Calzada & Sales, 2019)	US	175	no	Mexican Americans	1st generation or later immigrants	AMAS	CES-D*
(Carden et al., 2021)	US	1032	no	African Americans	Ethnic minorities	1-item from the Race Attitudes Module of the General Social Survey	WMH-CIDI* (anxiety)
(Çelebi et al., 2017)	TR	361	no	Syrians	Refugees	Self-developed Syrian identification scale and identity needs scale (Smeekes & Verkuyten, 2014)	HSCL-25*
(Chang & Samson, 2018)	US	2231	no	Filipino Americans	1st generation or later immigrants	MEIM	SCL-90-R*
Chen et al., (2021)	China	659	Yes	Tibetans	Ethnic minorities	Social Identity Scale (Chen et al., 2021)	DASS-21*
(Cheng et al., 2016)	US	207	yes	Mexican Americans	1st to 5th generation immigrants	MEIM	PHQ-9*
(Cheref et al., 2019)	US	742	yes	African Americans, Asian Americans, Hispanics	2nd generation or later immigrants	MEIM	BDI*, STAI*
(Choi et al., 2017)	US	353	yes	Asian, Asian American	Ethnic minorities	MEIM	CES-D*
(Christophe et al., 2021)	US	364	yes	Asian, Blacks, Latinxs, Middle Easterners, Native Americans, other	Ethnic minorities (including immigrants)	MIBI	DASS-21*
(Christophe et al., 2022)	US	364	yes	Asian, Blacks, Latinxs, Middle Easterners, Native Americans, other	Ethnic minorities (including immigrants)	MIBI	DASS-21*
(Cislo et al., 2010)	US	191	no	Cubans	1st generation immigrants	Self-developed American and ethnic identity scales	CES-D*, Anxiety scale adapted from RSES
(Cobb et al., 2017)	US	122	no	Latinxs	Undocumented immigrants	AMAS	CES-D*
(D. K. Cooper et al., 2020)	US	2893	no	Latinxs	1st generation immigrants	SEE	CES-D*
(David et al., 2009) Study 2	US	164	yes	African Americans, Asian Americans, Latinxs, other	Ethnic minorities (including immigrants)	CSES, MEIM	CES-D*
(David, 2008)	US	248	no	Filipino Americans	2nd generation or later immigrants	CSES, MEIM	CES-D*, MASQ*
(Debrosse et al., 2018)	CA	151	yes	Asians, Europeans, Middle Easterners	Ethnic minorities (including immigrants)	CSES	CES-D*, STAI*

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Table C1 (*continued*)

Author(s)	Location	Sample size	Student sample	Ethnicity/race	Migration status	Social identity measures	CMD measures
(Debrosse et al., 2018)	IT	204	no	Africans, Asians, Europeans	1st and 2nd generation immigrants	AAS, Adapted religious in-group identification pictorial item from IIS	CES-D*
(Ghabrial & Andersen, 2021)	Canada & US	703	no	–	Ethnic minorities	LGBIS, MEIM	CES-D*
(Gonidakis et al., 2011)	GR	317	no	Africans, Asians, Europeans	1st generation immigrants	IAS	CES-D*
(Gonyea et al., 2018)	US	216	no	African Americans, Blacks, Hispanics/ Latinxs	Ethnic minorities	3-item Community Membership Scale of the Sense of Community Index	CES-D*
(Gummadam et al., 2016)	US	311	yes	African Americans, Asian Americans, Hispanic Americans, Other	1st, 2nd, and 3rd generation immigrants	MEIM, PSSM	CES-D*
(H. Lee & Williams, 2013)	US	206	yes	Koreans, Korean Americans	Ethnic minorities (including immigrants)	SOBI-P	BDI*
Hachem et al., (2022)	US	707	Yes	Latinxs	1st and 2nd generation immigrants	MEIM	BAI*, BDI*
(Holttum, 2017)	US	3570		African Americans	Ethnic minorities	9-item measure of closeness to African Americans (Hughes, Kiecolt, Keith, & Demo, 2015)	CES-D*
(Hovey et al., 2006)	US	133	yes	Korean Americans	1st generation or later immigrants	MEIM	CES-D*, STAI*
(Hun et al., 2021)	Chile	959	no	Colombians	1st generation immigrants	MEIM	BAI*
(Huynh et al., 2011)	US	221	yes	Asian Americans, Latinxs	1st generation or later Immigrants	SEE	CES-D*
Huynh et al., (2022)	US	380	No	Asian, Asian American	Ethnic minorities	MEIM	CES-D*, GAD-7*
(Iturbide et al., 2009)	US	148	yes	Mexicans, Mexican Americans	Ethnic minorities (including immigrants)	MEIM	CES-D*
(J. Lee et al., 2013)	US	123	no	Indigenous Mexicans	1st generation immigrants	OCIS	PHQ-9*
Jorgenson and Nilsson (2021)	US	80	No	Blacks	Refugees	AMAS	HSCL-25*, PSS-SR*
(Kim & Rew, 1994)	US	76	no	Korean Americans	1st generation immigrants	EIQ	CES-D*
(Kira et al., 2017)	EG	196	no	Syrians	Refugees	ISS	CAPS, CTD
(Lam, 2007)	US	122	yes	Vietnamese Americans	Ethnic minorities (including immigrants)	CSES	CES-D*, STAI*
(Lane & Miranda, 2018)	US	42	yes	Africans, Asians, Europeans, other	1st generation immigrants	MEIM	BDI*
(Lantrip et al., 2015)	US	70	yes	Asian Americans	Ethnic minorities	EIS	CES-D*
(Lewin et al., 2011)	US	230	no	African Americans	Ethnic minorities (nonimmigrant)	MEIM	CES-D*
(Livingston et al., 2007)	US	418	no	Caribbean	1st generation immigrants	Self-developed group affiliations scale	CES-D*
(Marks et al., 2021)	US	189	yes	Blacks	Ethnic minorities	MEIM	DASS-21*
(Meca et al., 2019)	US	416	yes	Latinxs	1st and 2nd generation immigrants	EIS	CES-D*
(Monk, 2020)	US	3268	no	African Americans	Ethnic minorities	1-item self-developed item of closeness to Blacks	WMH-CIDI* (anxiety)
(Mossakowski, 2003)	US	2109	no	Filipino Americans	1st generation or later immigrants	Ethnic identity scale (Phinney, 1992)	SCL-90-R*
(Mossakowski, 2007)	US	2129	no	Filipino Americans	1st generation or later immigrants	Ethnic identity scale (Mossakowski, 2003)	SCL-90-R*
(Perreira et al., 2015)	US	15,004	no	Hispanics, Latinxs	1st generation or later immigrants	MEIM	CES-D*, STAI*
(R. M. Lee, 2005)	US	84	yes	Korean Americans	1st generation or later	MEIM, SCS	CES-D*
(S. K. Jones et al., 2018)	US	171	yes	Mexican Americans	Ethnic minorities (including immigrants)	EIS	CES-D*

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Table C1 (*continued*)

Author(s)	Location	Sample size	Student sample	Ethnicity/race	Migration status	Social identity measures	CMD measures
(Sanchez et al., 2012)	US	53	yes	Hispanics, Latinxs	Ethnic minorities (including immigrants)	CSES	CES-D*
(Santos & VanDaalen, 2016)	US	208	no	African Americans, Asian Americans, Latinxs, Native Americans, Other	1st, 2nd, and 3rd generation immigrants	MEIM	BSI*
(Santos & VanDaalen, 2018)	US	208	no	African Americans, Asian Americans, Latinxs, Native Americans, other	1st generation or later immigrants	Adapted scale (Battle & Harris, 2013)	BSI*
(Smeekes et al., 2017)	TR	361	no	Syrians	Refugees	Self-developed scales of group belonging and group membership continuity	HSCL-25*
(st. Louis & Liem, 2005)	US	144	yes	Asians, Blacks, Latinxs	Ethnic minorities (including immigrants)	MEIM	BDI*
(Suh et al., 2019)	South Korea	121	yes	Asians, Middle Easterners	1st generation immigrants	MEIM	BAI*, CES-D*
Tartakovsky & Vorobiova (2022)	Israel	601	No	–	1st generation immigrants	Adapted identification scales from Roccas (1997)	PCL*
(Thibeault et al., 2018)	US	290	yes	Asians, Blacks, Latinxs, Middle Easterners, other	1st generation or later immigrants	MEIM	BDI*
Thornhill et al., (2021)	US	200	No	Latinxs	Ethnic minorities (including immigrants)	MEIM	CES-D*, GAD-7*
(Tikhonov et al., 2019)	US	766	yes	Asians, Blacks, Hispanics, other	1st and 2nd generation immigrants	MEIM	STAI, * CES-D*
(Tineo et al., 2021)	US	209	yes	Asians, Blacks, Hawaiian/ Pacific Islanders, Hispanics/ Latinxs, other	1st generation or later immigrants	MEIM	GAD-7*, PHQ-8*
(Tucker et al., 2016)	US	123	yes	American Indians	Ethnic minorities	SEE	CES-D*
(Tummala-Narra et al., 2018)	US	465	yes	Asian Americans	1st generation or later immigrants	MEIM	BAI*, CES-D*
(Tummala-Narra et al., 2021)	US	173	yes	Chinese	1st generation or later immigrants	MEIM	BAI*, CES-D*
Urzúa et al., (2021)	Chile	908	No	Colombians	1st generation immigrants	CSES, MEIM	BAI*, BDI*
(Weisskirch et al., 2016)	US	280	yes	Jewish American	Ethnic minorities	EIS, MEIM	CES-D*

Note. Abbreviations: AAS, Acculturation Attitudes Scale; AMAS, Abbreviated Multidimensional Acculturation Scale; BAI, Beck Anxiety Inventory; BDI, Beck Depression Inventory; BSI, Brief Symptom Inventory; CAPS, Clinician-Administered Posttraumatic Stress Disorder Scale; CES—D, Center for Epidemiological Studies Depression Scale; CMD, Common Mental Disorder; CSES, Collective Self-esteem Scale; CTD, Cumulative Trauma Disorders; DASS, Depression, Anxiety and Stress Scale; DSM, Diagnostic and Statistical Manual of Mental Disorders; EIQ, Ethnic Identity Questionnaire; EIS, Ethnic Identity Scale; GAD, Generalized Anxiety Disorder; HSCL, Hopkins Symptom Checklist; IAS, Immigrant Acculturation Scale; IDAS, Inventory of Depression and Anxiety Symptoms; IIS, Inclusion of In-Group in the Self; ISS, Identity Salience Scale; K – Kessler Psychological Distress Scale; LGBIS, Lesbian, Gay, Bisexual Identity Scale; LIB, Language, Identity, and Behavior; MASQ, Mood and Anxiety Symptoms Questionnaire; MEIM, Multi-Ethnic Identity Measure; MIBI, Multidimensional Inventory of Black Identity; OCIS, Orthogonal Cultural Identification Scale; PCL, Posttraumatic Stress Disorder Checklist; PHQ, Patient Health Questionnaire; PSSM, Psychological Sense of School Membership; RSES, Rosenberg self-esteem scale; PSS-SR, Posttraumatic Stress Disorder Scale-Self Report; SCL-90-R, Symptom Checklist-90-Revised; SCS, Social Connectedness Scale; SEE, Scale of Ethnic Experience; SOBI-P, Sense of Belonging Instrument-Psychological; STAI, State-Trait Anxiety Inventory; WMH-CIDI, World Mental Health Composite International Diagnostic Interview.

Appendix D

Table D1
Methodological quality assessment of each study.

Author(s)	Sampling method		Sample rep.	Response rate	Measures	Language	Total
	(a)	(b)					
(Ai et al., 2021)	1		1	0	1	1	4
(Alemi et al., 2017)		0	0	0	0	0	0
(Anglin et al., 2018)		1	0	0	1	1	3
(Antonio et al., 2016)		0	0	0	0	1	4
(Arbona & Jimenez, 2014)		1	1	0	1	1	4
(Atkin & Tran, 2020)		1	0	0	1	1	3
(Begeny & Huo, 2018)		1	1	0	1	1	4
(M. N. Beiser & Hou, 2006)	1		1	1	0	1	4
(Birman & Tran, 2008)		1	1	0	1	1	4
(Bombay et al., 2010)		1	0	0	1	1	3
(Braby et al., 2020)		0	0	0	1	1	2
(Brittian et al., 2013)		1	0	0	1	1	3
(Brittian et al., 2015)		1	0	0	1	1	3
(Buckner et al., 2022)		0	0	0	1	1	3
(Calzada & Sales, 2019)		0	1	0	1	1	3
(Carden et al., 2021)	1		1	0	0	1	3
(Çelebi et al., 2017)		1	1	0	1	1	4
(Chang & Samson, 2018)	1		1	1	1	1	5
(Chen et al., 2021)	1		1	1	1	1	5
(Cheng et al., 2016)		1	0	0	1	1	3
(Cheref et al., 2019)		1	1	0	1	1	4
(Choi et al., 2017)	1		0	0	1	1	3
(Christophe et al., 2021)		1	0	0	1	1	3
(Christophe et al., 2022)		1	0	0	1	1	3
(Cislo et al., 2010)	1		1	1	0	1	4
(Cobb et al., 2017)		0	1	0	1	1	3
(D. K. Cooper et al., 2020)	1		1	0	1	1	4
(David et al., 2009) Study 2		0	0	0	1	1	2
(David, 2008)		1	1	0	1	1	4
(Debrosse et al., 2018)		0	1	0	1	0	2
(Ghabrial & Andersen, 2021)		1	0	0	1	0	2
(Giuliani et al., 2018)		1	1	0	0	0	2
(Gonidakis et al., 2011)		1	1	1	1	0	4
(Gonyea et al., 2018)		1	0	1	1	1	4
(Gummadam et al., 2016)		1	0	0	1	1	3
(H. Lee & Williams, 2013)		1	0	0	1	1	3
Hachem et al., (2022)		1	0	0	1	1	3
(Holttum, 2017)	1		1	1	0	1	4
(Hovey et al., 2006)	1		0	0	1	1	3
(Hun et al., 2021)		1	1	0	1	1	4
(Huynh et al., 2011)		1	0	0	1	1	3
Huynh et al., (2022)		1	0	0	1	1	3
(Iturbide et al., 2009)		0	0	0	1	1	2
(J. Lee et al., 2013)		0	1	0	1	1	3
(Jorgenson & Nilsson, 2021)		0	0	0	1	1	2
(S. K. Jones et al., 2018)		0	0	1	1	1	3
(S. Kim & Rew, 1994)		0	1	0	1	1	3
(Kira et al., 2017)		0	1	0	1	1	3
(Lam, 2007)		0	0	0	1	1	2
(Lane & Miranda, 2018)		0	1	0	1	0	2
(Lantrip et al., 2015)		0	0	0	1	1	2
(Lewin et al., 2011)	1		1	1	1	1	5
(Livingston et al., 2007)	1		0	1	0	0	2
(Marks et al., 2021)		0	0	0	1	1	2
(Meca et al., 2019)		1	0	0	1	1	3
(Monk, 2020)	1		1	1	1	1	5
(Mossakowski, 2003)	1		1	1	1	1	5
(Mossakowski, 2007)	1		1	1	1	1	5
(Perreira et al., 2015)	1		0	1	0	1	3
(R. M. Lee, 2005)		0	0	0	1	1	2
(Sanchez et al., 2012)		0	0	0	1	1	2
(Santos & VanDaalen, 2016)		1	1	0	1	1	4
(Santos & VanDaalen, 2018)		1	1	0	1	1	4
(Smeekes et al., 2017)		1	1	0	0	1	3
(st. Louis & Liem, 2005)		1	1	1	1	1	5
(Suh et al., 2019)		0	0	0	1	1	2
(Tartakovsky & Vorobiova, 2022)		1	0	1	0	1	3
(Thibeault et al., 2018)		1	0	0	1	1	3
(Thornhill et al., 2021)		1	0	0	1	1	3
(Tikhonov et al., 2019)		1	1	0	1	1	4
(Tineo et al., 2021)		1	0	0	1	1	3

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Table D1 (*continued*)

Author(s)	Sampling method		Sample rep.	Response rate	Measures	Language	Total
	(a)	(b)					
(Tucker et al., 2016)		0	0	0	1	1	2
(Tummala-Narra et al., 2018)		1	1	0	1	0	3
(Tummala-Narra et al., 2021)		0	0	0	1	1	2
Urzúa et al., (2021)		1	1	0	1	1	4
(Weisskirch et al., 2016)	1		0	1	1	1	4

Note. Rep. = sample representativeness.

Appendix E

Table E1
Moderating role of participant characteristics on depression.

Moderator variables	No. of studies	Effect size [95% confidence interval]
Migration Status		
1st gen. Immigrants	9	0.04 [− 0.04 to 0.12]
2nd gen. or later immigrants	3	- 0.09 [−0.24 to 0.05]
Ethnic minorities	24	- 0.12* [− 0.17 to - 0.08]
Refugees	6	0.04 [− 0.06 to 0.13]
Mix of immigration statuses	28	- 0.12* [− 0.16 to - 0.08]
Ethnicity/Race		
African/African American	9	- 0.11* [− 0.18 to - 0.02]
Asian/Asian American	20	- 0.13* [− 0.18 to - 0.08]
Hispanic/Latin	17	- 0.09* [− 0.15 to - 0.03]
Middle Easterner	4	- 0.01 [− 0.13 to 0.11]
Mix of ethnic backgrounds	17	- 0.10* [− 0.16 to - 0.05]
Other	6	- 0.02 [− 0.12 to 0.08]
Student Status		
Student	36	- 0.15* [− 0.18 to - 0.12]
Non-student	33	- 0.03 [− 0.06 to 0.01]

Note. *significant at $p < .05$; studies that reported data separately for different migration status groups or for different ethnic groups had more than one effect size included in the analysis.

Appendix F

Table F1
Moderating role of methodological characteristics on depression.

Moderator variables	No. of studies	Effect size [95% confidence interval]
Social Identity measure		
EIS	6	- 0.21* [− 0.30 to - 0.12]
CSES	7	- 0.21* [− 0.29 to - 0.11]
MEIM	33	- 0.10* [− 0.14 to - 0.06]
Other	32	- 0.07* [− 0.11 to - 0.02]
Depression measure		
BDI	9	- 0.19* [− 0.27 to - 0.12]
CES-D	45	- 0.11* [− 0.15 to - 0.08]
HSCL	4	0.04 [− 0.09 to 0.16]
PHQ	5	0.05 [− 0.06 to 0.17]
Other	15	- 0.10* [− 0.15 to - 0.04]
Social identity dimensions		
Collective identity	6	- 0.14* [− 0.25 to - 0.03]
Ethnic identity	56	- 0.09* [− 0.12 to - 0.05]
Identification with the mainstream culture	7	0.10* [0.003 to 0.20]
National identity	5	0.12* [0.004 to 0.24]
Other	11	- 0.21* [− 0.28 to - 0.13]
Research setting		
North America	61	- 0.10* [− 0.13 to - 0.07]
Other	8	- 0.04 [− 0.12 to 0.04]
Sample Size		
Under 200 participants	24	- 0.06* [− 0.12 to - 0.01]
Over 200 participants	45	- 0.10* [− 0.13 to - 0.07]
Sampling Method		
Random	15	- 0.07* [− 0.12 to - 0.02]
Non-random	54	- 0.10* [− 0.13 to - 0.07]
Language of Assessment		
Native	57	- 0.09* [− 0.12 to - 0.06]
Non-native	4	- 0.10 [− 0.20 to 0.02]
Not reported	8	- 0.10* [− 0.18 to - 0.02]

Note. Abbreviations: BDI, Beck Depression Inventory; CES—D, Center for Epidemiological Studies Depression Scale; CSES, Collective Self-esteem Scale; EIS, Ethnic Identity Scale; GAD, Generalized Anxiety Disorder; HSCL, Hopkins Symptom Checklist; MEIM, Multi-Ethnic Identity Measure. *significant at $p < .05$, this analysis disaggregated different types of measurements of

social identity and depression within studies, such that those studies with multiple measurement types had more than one effect size included in the analysis.

Appendix G

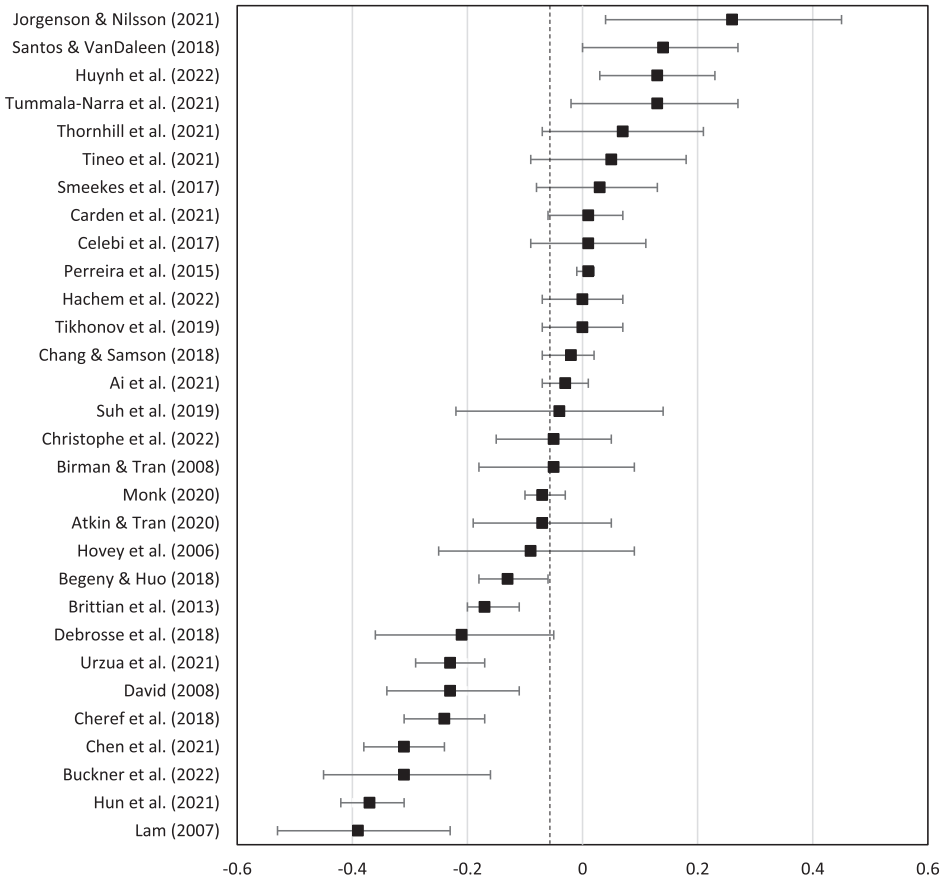

Fig. G1. Anxiety effect size by study.
Note. Effect size in Pearson's *r*; error bars indicate 95% confidence intervals. The dashed line indicates the average weighted effect size.

Appendix H

Table H1
Moderating role of participant and methodological characteristics on anxiety.

Moderator variables	No. of studies	Effect size [95% confidence interval]
Participant characteristics		
Student Status		
Student	15	- 0.12* [− 0.18 to - 0.06]
Non-student	16	- 0.05 [− 0.11 to 0.01]
Methodological characteristics		
Social Identity measure		
CSES	4	- 0.23* [− 0.36 to - 0.09]
MEIM	16	- 0.09* [− 0.16 to - 0.02]
Other	12	- 0.04 [− 0.12 to 0.03]
Anxiety measure		
BAI	6	- 0.14* [− 0.24 to - 0.04]
GAD	4	0.05 [− 0.09 to 0.17]
HSCL-25	4	0.04 [− 0.09 to 0.18]
STAI	7	- 0.14* [− 0.23 to - 0.04]
Other	11	- 0.11* [− 0.19 to - 0.04]
Research setting		
North America	24	- 0.06* [− 0.10 to - 0.01]
Other	6	- 0.17* [− 0.26 to - 0.09]
Sample Size		
Under 200 participants	6	- 0.11 [− 0.22 to 0.01]
Over 200 participants	24	- 0.07* [− 0.12 to - 0.02]
Sampling Method		

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Table H1 (*continued*)

Moderator variables	No. of studies	Effect size [95% confidence interval]
Random	7	- 0.07 [− 0.15 to 0.01]
Non-random	23	- 0.08* [− 0.13 to - 0.03]

Note. Abbreviations: BAI, Beck Anxiety Inventory; CSES, Collective Self-esteem Scale; GAD, Generalized Anxiety Disorder; HSCL, Hopkins Symptom Checklist; MEIM, Multi-Ethnic Identity Measure; STAI, State-Trait Anxiety Inventory. *significant at $p < .05$, this analysis disaggregated different types of measurements of social identity and anxiety within studies, such that those studies with multiple measurement types had more than one effect size included in the analysis.

Appendix I

Table I1
Number of anxiety studies by participant and methodological characteristics for the unexplored moderators.

Moderator variables	No. of studies
Participant characteristics	
Migration Status	
1st generation	3
2nd generation or later immigrants	2
Ethnic minorities	8
Refugees	4
Mix of immigration statuses	13
Ethnicity/Race	
African/African American	5
Asian/Asian American	13
Hispanic/Latin	6
Middle Easterner	2
Mix of ethnic backgrounds	8
Methodological characteristics	
Social identity dimensions	
Collective identity	3
Ethnic identity	23
Identification with the mainstream culture	3
National identity	1
Other	4

Appendix J. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.cpr.2022.102216.

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